

Wen Ting Long

Demonstrating Social Networks with Java

Bachelor's Thesis
Information Technology


April 2011



MIKKELIN AMMATTIKORKEAKOULU

Mikkeli University of Applied Sciences

DESCRIPTION

 <p>MIKKELIN AMMATTIKORKEAKOULU Mikkeli University of Applied Sciences</p>		Date of the bachelor's thesis 1 April 2011	
Author(s) Wen Ting Long		Degree programme and option Information Technology	
Name of the bachelor's thesis Demonstrating Social Networks with Java			
Abstract <p>Recently, it has become a popular trend to program projects related to social networks. Java is one of the most popular programming languages and in my project I used it to describe the social relationships in graphical format. There are two parts in my project. The first is the handing a text file with Java (both writing and reading a file), and the second, uses the graphics to demonstrate social networks and their relationship. In other words, I used graphics to visualize the structure of a social network, or social relationships</p> <p>There are already various kinds of applications to work with social network data. The usual types of applications account the data of a social network. My project focuses on representation of data in social networks with graphics. In this way, the application is able to not only provide services to experts, but also to show the results to individual users.</p>			
Subject headings, (keywords) Java, Social Networks			
Pages 50 p. + app.	Language English	URN	
Remarks, notes on appendices			
Tutor Matti Koivisto		Employer of the bachelor's thesis Mikkeli Univerisity of Applied Science	

Acknowledgement

I want to express my appreciation to all those people who helped me in completing the final thesis. Without all their help, I could have not finished the thesis in a quite small time.

Firstly, I would like to thank my supervisor, Matti Koivisto. He gave me critical guidance when I was confused what to do at the initial stage of the thesis. Also, when I came across difficulties and felt frustrated, he always encouraged me not to give up, like he said, “No problem, just challenges”. I learned a lot also from his rich experience in programming when debugging my own application.

Then, thanks to those smiling faces of my friends and strangers when I was down, I could keep on going instead of being obsessed in the failures.

Finally, I would like thank all of people in my life, like my family, my classmates, and so on. Through their help and support, I was able to finish my final thesis.

LIST OF FIGURES

Figure 2.1: The Logo of Java

Figure 2.2: Java Platform diagram from Sun

Figure 2.3: The Platform of Eclipse

Figure 2.4: The Platform of MyEclipse

Figure 2.5: The Platform of NetBeans IDE

Figure 2.6: NetBeans IDE Downloading Bundles

Figure 2.7: The Installation of JDK 6

Figure 2.8: The Installation of NetBeans IDE

Figure 3.1: An example of a social network diagram. The node with the highest between centrality is marked in yellow

Figure 3.2: Example of rectangular data array

Figure 3.3: Example of square array of network data

Figure 3.4: The types of graphs I

Figure 3.5: The types of graphs II

Figure 3.6: the types of graphs III

Figure 3.7: The logo of RenRen Social Network

Figure 4.1: Downloading JDK6

Figure 4.2: The platform of my application

Figure 4.3: Using Java to draw circle

Figure 4.4: The structures of my .txt file

Figure 4.5: My application platform

Figure 5.1: The tests of writing file

Figure 5.2: The tests of reading file

Figure 5.3: the tests of display network structure

Figure 5.4: The first step of implementation of my program

Figure 5.5: The Second step of implementation of my program

Figure 5.6: The Third step of implementation of my program

Figure 5.7: The example of my program prospect future

CONTENTS

1 INTRODUCTION.....	5
2 JAVA PROGRAMMING LANGUAGE AND NETBEANS PROGRAMMING ENVIRONMENT.....	6
2.1 The History of Java Programming Language.....	7
2.2 The Introduction of Java 2 SE.....	7
2.2.1 The Definition of Java 2 SE.....	7
2.2.2 The Java Runtime Environment (JRE).....	8
2.2.3 Java Development Kit (JDK)	9
2.3 The Java SDK tools.....	10
2.4 The Java platform tools.....	10
2.4.1 Eclipse.....	11
2.4.2 MyEclipse.....	12
2.5 Netbeans Programming Environments.....	13
2.5.1 Netbeans Programming Environments.....	13
2.5.2 The Installation and Downloading of NetBeans IDE.....	15
3 SOCIAL NETWORKS.....	18
3.1 Definition of Social Networks.....	18
3.2 social network data.....	19
3.3 Using graphs to represent social relations.....	20
3.3.1 The types of graphs.....	21
3.3.2 Graphs and Sociograms.....	22
3.4 Social network analysis software.....	23
3.5 The history of the social network analysis with graphics.....	24
3.6 Social Media in Business.....	25
4 DESIGN JAVA APPLICATIONS WITH DEMONSTRATING SOCIAL NETWORK.....	28
4.1 Building the Programming Environment.....	28

4.2 Creating a project.....	39
4.3 The Java with graphics.....	30
4.4 File handing in Java.....	33
4.5 The platform to display network structure.....	36
5. IMPLEMENTATION AND TESTING OF MY PROGRAM.....	39
5.1 The introduction of my program.....	39
5.2 Testing of my program.....	39
5.3 Implementation of my program.....	42
5.4 The future prospect and challenges of my application.....	44
6 CONCLUSIONS.....	46
6.1 Conclusion.....	46
6.2 Future prospect of social network with Java.....	47
REFERENCES.....	48
APPENDICES.....	51

1 INTRODUCTION

Recently, social networks have become popular. The huge popularity of social media sites like Facebook, MySpace, and LinkedIn has moved the Internet towards social connections and their representation. Although different kinds of methods have been introduced there is still a need for new solutions, especially when we want to demonstrate the development of a social network over a longer period of time. To my mind, the social network application will be more and more popular in the computer science field in the future. Examples of these are such as the eCoach in NOKIA N900 of mobile phone, or the Nike+ Running Monitor.

In this final thesis, I program a Java application which represents the relationships between the members of a social network with graphics. The application is based on Java SE platform. There are two main parts in my project. The first one is about storing the relationship information and the second one is to display the network structure to the user. In my application the information is stored in a text file and my application is able to write and read this file. In the representation of the social network the basic java graphic classes will be used.

The structure of my study is as follows. In Chapter 2 I introduce Java programming language and Netbeans programming environment I use. Chapter 3 includes a short introduction to social networks. The design of my application is explained in Chapter 4 and Chapter 5 consists of both the implementation and testing of my program. Some final conclusions and areas of future development are made in Chapter 6.

2 JAVA PROGRAMMING LANGUAGE AND NETBEANS PROGRAMMING ENVIRONMENT

2.1 The History of Java Programming Language

In the early 1990s, Sun Microsystems created a new programming language called Oak. A few years later, Sun was ready to make Oak a real product. Unfortunately, Oak's name did not pass the trademark test. Some other choices, like Silk, Ruby, and WRL (for WebRunner Language), did not cut the mustard, either, but eventually the name Java won out and made its way through a legal review.[36]

In June 1991, James Gosling, Mike Sheridan, and Patrick Naughton initiated the Java language project. Java was originally designed for interactive television, but it was too advanced. Java programming language derives much of its syntax from C and C++ but has a simpler object model and fewer low-level facilities. [36] Figure 2.1 [1] shows the logo of Java.



Figure 2.1: The Logo of Java [1]

The first Java platform was released in 1995 as Java 1.0 by Sun Microsystems. It promised "Write Once, Run Anywhere" (WORA), providing no-cost run-times on popular platforms. In that time, Java, the platform, began to evolve, and Microsoft thought it was important enough to incorporate into their Internet Explorer browser. As a result of that Java quickly became popular. With the advent of Java 2 (released initially as J2SE 1.2 in December 1998–1999), the new versions had multiple configurations built for different types of platforms. Thus in 1996 the Java spread to three editions: mobile Java (JavaME), J2EE targeted enterprise applications, and J2SE. My application is based on Java 2 SE. Therefore, I introduce more about Java 2 SE in the following section. [35]

2.2 The Introduction of Java 2 SE

2.2.1 The Definition of Java 2 SE

The Java 2 SE (Java Platform, Standard Edition) is a widely used platform for programming with Java language. Java SE lets you develop and deploy Java applications on desktops and servers, as well as today's demanding embedded and Real-Time environments. [35]

In practical terms, Java SE consists of a virtual machine, which must be used to run Java programs, together with a set of libraries (or "packages") needed to allow the use of file systems, networks, graphical interfaces, and so on. There are some examples in Java SE packages, such as `Java.lang`, `Java.lang.ref`, `Java.io`, and `Java.lang.reflect`, etc. Java package used in my application are listed in Table 2.1.

Table 2.1 The list of my Java application packages

java.awt.*;
java.awt.event.*;
java.io.*;
java.awt.Frame;
java.awt.Graphics;
java.io.BufferedReader;
java.io.File;
java.io.FileReader;
java.io.FileNotFoundException;
java.io.IOException.

2.2.2 The Java Runtime Environment (JRE)

There are two principal products in the Java SE platform family: Java SE Runtime Environment (JRE) and Java Development Kit (JDK). The Java Runtime Environment (JRE) provides the libraries, the Java Virtual Machine, and other components to run applets and applications written in the Java programming language. There are two main program types for workstations: applets and applications. The applet is defined that the applet is started by a Web browser loading an HTML file. However, since applets are downloaded over the web, in consideration of the download lag to receive the files from the web server and then start them up in the browser. Application, on the other hand, is installed on the client, get started from the command line and suffer from no download limitations. [35]

2.2.3 Java Development Kit (JDK)

The JDK is a Sun Microsystems product for Java developers and it includes for example the compilers and debuggers necessary for developing applets and applications. Since the introduction of Java, it has been by far the most widely used Java SDK. [50]

When starting with Java, many developers begin with Sun's development kit, the SDK. It is free and you can always work with the latest version. The SDK is a set of a tool for creating Java programs. And also we have to know Java platform which is combination of the runtime environment and related libraries. Standard JDK tools and utilities are listed in Table 2.2. [35]

Table 2.2 The Standard JDK Tools and Utilities

Basic Tools (javac, java, javadoc, apt, appletviewer, jar, jdb, javah, javap, extcheck)
Security Tools (keytool, jarsigner, policytool, kinit, klist, ktab)
Internationalization Tools (native2ascii)
Remote Method Invocation (RMI) Tools (rmic, rmiregistry, rmid, serialver)
Java IDL and RMI-IIOP Tools (tnameserv, idlj, orbd, servertool)
Java Deployment Tools (pack200, unpack200)
Java Plug-in Tools (htmlconverter)
Java Web Start Tools (javaws)
Java Troubleshooting, Profiling, Monitoring and Management Tools (JConsole, Java VisualVM)
Java Web Services Tools (schemagen, wsgen, wsimport, xjc)

2.3 The Java SDK tools

Before we download and install the Java 2 SDK, we have to know the included tools and how they work together. There are 23 utilities will use it, some examples of these utilities show on Table 2.3. [35]

Table 2.3 The examples list of Java 2 SDK Utilities

javac	The Java compiler. Converts source code to byte codes.
java	The Java application launcher. Executes bytes codes for an application.
appletviewer	The Java applet launcher. Executes byte for an applet.
javadoc	The Java commenting tool. Generates HTML documentation from Java source file.
jdb	The Java debugger. Steps through programs as they execute, sets breakpoints and monitors behavior.
javap	The Java disassemble. Examines the bute codes to display information.
jar	Java (JAR) manager. Combines and compress multiple files and directories into one.
javah	Header file generator. Used when combining Java with C/C++ programs.

2.4 The Java platform tools

The Java SE platform works with an array of tools, including Integrated Development Environments (IDEs), performance and testing tools, and performance monitoring tools. Java SE contains several tools to assist in program development and debugging, and in the monitoring and troubleshooting of production applications. Figure 2.2 [2] shows Java Platform diagram from Sun. [36]

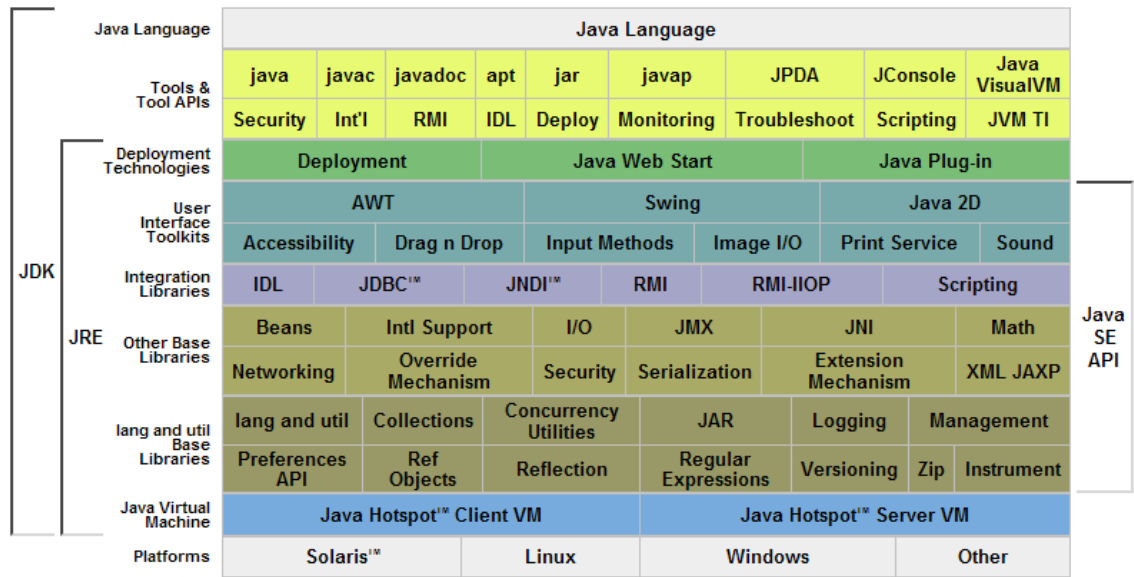


Figure 2.2: Java Platform diagram from Sun [2]

An edition of the Java platform is the name for a package of related programs from Sun which allow for developing and running programs written in the Java programming language. Except some necessary tools which we have to installing and downloading when we use Java language to compile to built applications, for example, JDK tools, etc. On the other hand, nowadays increasing with the Java became more and more popular, so that there are a number of package software products to support to write and run Java programming language, also we called Java compiler software, such as NetBeans, Eclipse, and MyEclipse, etc.

2.4.1 Eclipse

Eclipse is an open source community which was created in January 2004 by IBM as an independent not-for-profit corporation to act as the steward of the Eclipse community in which Figure [3] 2.3 shows the platform of Eclipse. It is a multi-language software development environment comprising an integrated development environment (IDE) and an extensible plug-in system. And it is written mostly in Java and can be used to develop applications in Java and, by means of various plug-ins, other programming languages, for

example, C++, PHP, Python, and so on. At the same time, the Eclipse is free software that is better for common user as open source software.

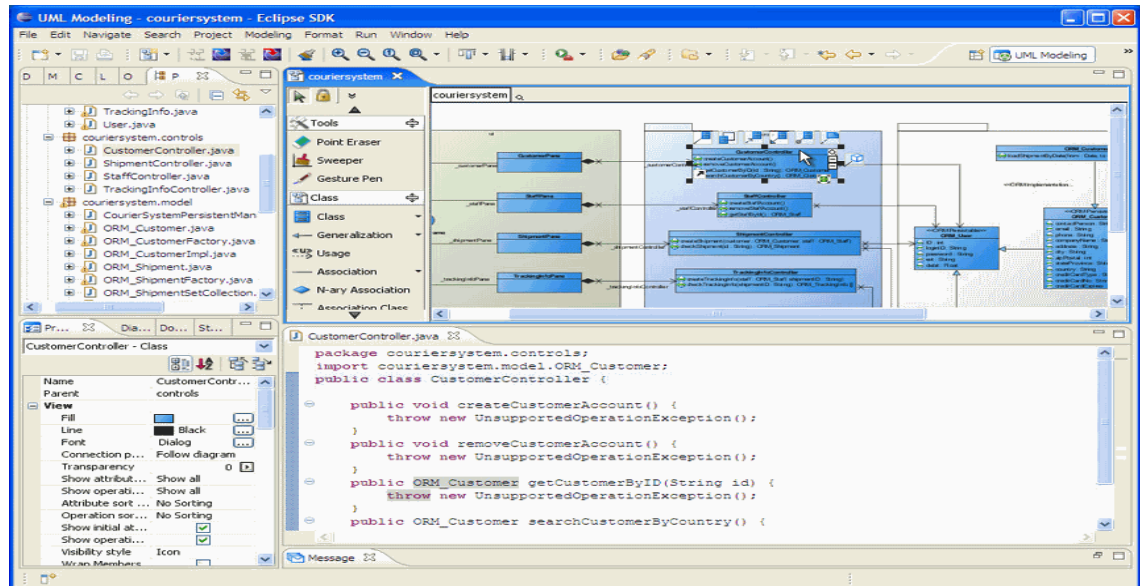


Figure 2.3: The Platform of Eclipse [3]

2.4.2 MyEclipse

MyEclipse is a Java and Web development tool suite for the Eclipse open-source platform created and maintained by the company Genuitec, a founding member of the Eclipse Foundation, but it is most used for J2EE IDE in which Figure 2.4 shows the platform of MyEclipse. MyEclipse is the Eclipse plugin-based solution for all your UML, AJAX, Web, Web Services, J2EE, JSP, XML, Struts, JSF, Java Persistence, EJB, extended database support and application server integration needs. Otherwise, the MyEclipse is commercial software, but you can free trial it.

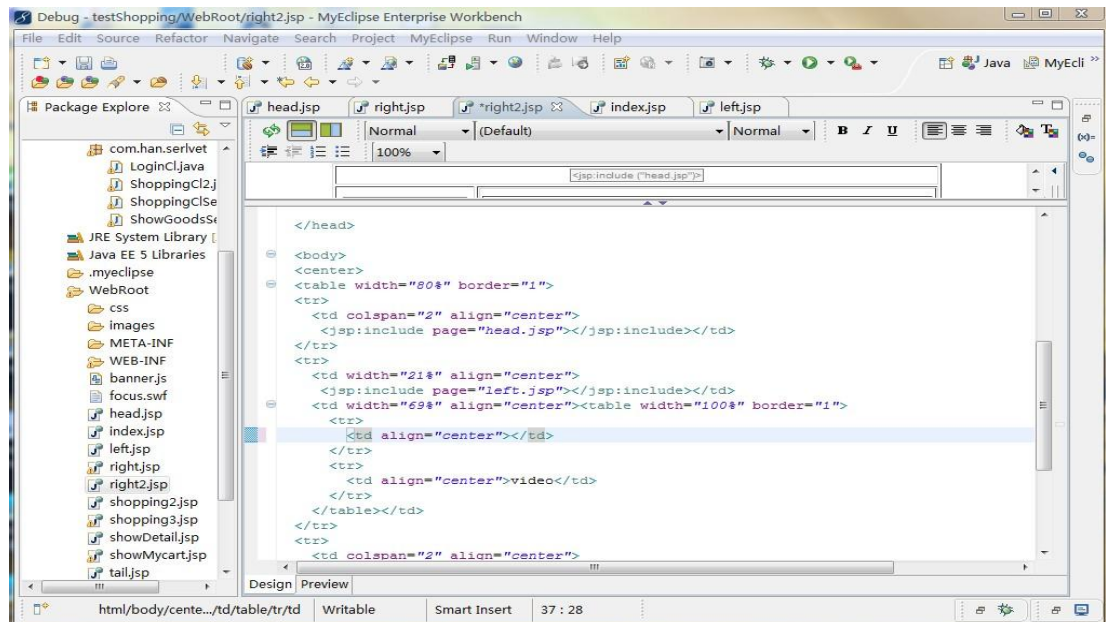


Figure 2.4: The Platform of MyEclipse

2.5 Netbeans Programming Environments

In my project, I will use NetBeans IDE to compile my Java application. The NetBeans IDE is used both a platform framework for Java desktop applications, and an integrated development environment (IDE) for developing with Java, JavaScript, PHP, Python, Ruby, Groovy, C, C++, Scala, Clojure, and others. And Netbeans IDE can runs on Windows, Linux, Mac OS X and Solaris. NetBeans IDE is open-source and free.

2.5.1 Netbeans Programming Environments

NetBeans IDE 6.9 is the newest release version of NetBeans IDE. Figure 2.5 shows the platform of NetBeans IDE. It introduces the JavaFX Composer, support for JavaFX SDK 1.3, OSGi interoperability, support for the PHP Zend framework and Ruby on Rails 3.0, and more. For my application, because of my application is based on the Java 2 SE platform. Thus, the NetBeans IDE already provided me with all the tools they need to create professional Java SE applications. The NetBeans IDE supports development for JDK 1.1, JDK 1.2, JDK 1.3, JDK 1.4, JDK 5.0, and JDK 6.

The package software of NetBeans IDE included editor, databases, version control, developer collaboration, and build tools. It can be work for JavaSE, JavaFX, JavaEE & Web, and Java Me & Embedded. It is also a multi-language software development environment comprising an integrated development environment, such as it works dynamic languages, like PHP, JavaScript, Ruby, and so on.

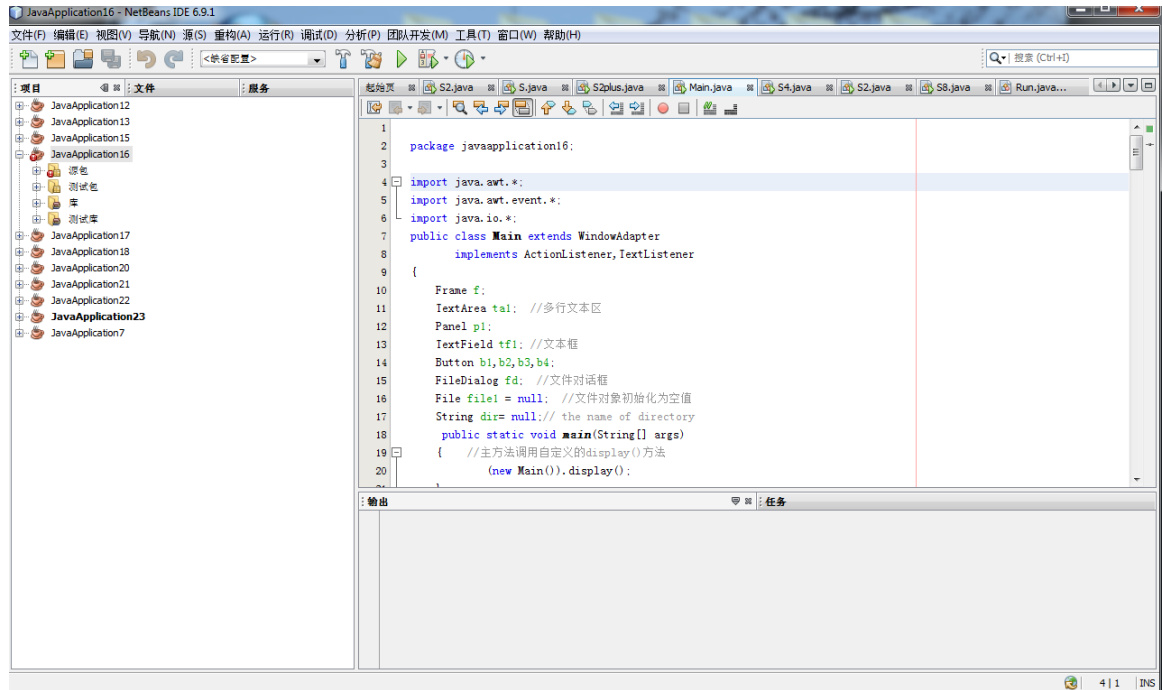


Figure 2.5: The Platform of NetBeans IDE

In my mind, the NetBeans IDE is best choice for the beginning learn java programming language user. These are some features of the NetBeans IDE, such as Annotation Processors, Javadoc Integration, Java Call Hierarchy, Compile on Save, and on-Proprietary Project Build System, etc. In my side, two of them give me the biggest help; for example, use the Auto Comment action to generate Javadoc code for your methods. Use the Javadoc Analyzer plugin to check and fix existing Javadoc comments; And the IDE builds your project automatically and the run/debug/test actions are immediately available after saving a file. These features really can help programmer detect and correct mistakes.

2.5.2 The Installation and Downloading of NetBeans IDE

The NetBeans IDE is an open source and free software. You can direct download from <http://netbeans.org/downloads/index.html>, and when you download it, you can choose which version you want to download, or choose the bundles of NetBeans IDE which shows on Figure 2.6.

NetBeans IDE Download Bundles							
Supported technologies *	Java SE	JavaFX	Java	Ruby	C/C++	PHP	All
NetBeans Platform SDK	•	•	•				•
Java SE	•	•	•				•
JavaFX		•	•				•
Java Web and EE			•				•
Java ME			•				•
Java Card™ 3 Connected			•				•
Ruby				•			•
C/C++					•		•
Groovy			•				•
PHP						•	•
Bundled servers							
GlassFish Server Open Source Edition 3.0.1			•	•			•
Apache Tomcat 6.0.26			•				•
	Download	Download	Download	Download	Download	Download	Download
	Free, 54 MB	Free, 129 MB	Free, 214 MB	Free, 88 MB	Free, 36 MB	Free, 31 MB	Free, 319 MB

Figure 2.6: NetBeans IDE Downloading Bundles

Two of reminded of your installing NetBeans IDE, when you want to run NetBeans IDE in your computer, you have to focus on it. The first of all, Java 6 is required for installing and running the PHP, Ruby and C/C++ NetBeans Bundles. And the second, JDK 6 is required for installing and running the Java SE, JavaFX, Java and all NetBeans Bundles. Figures 2.7 shows the installation of JDK 6. And Figures 2.8 is screenshot about the Installation of NetBeans IDE.

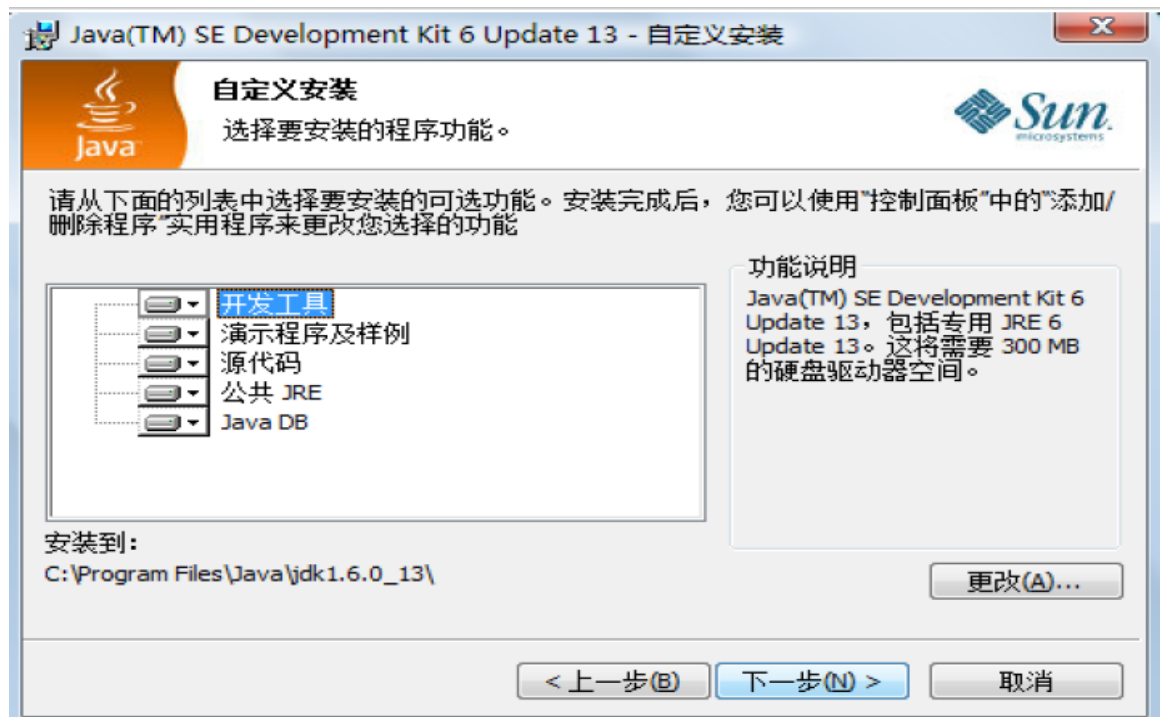


Figure 2.7: The Installation of JDK 6

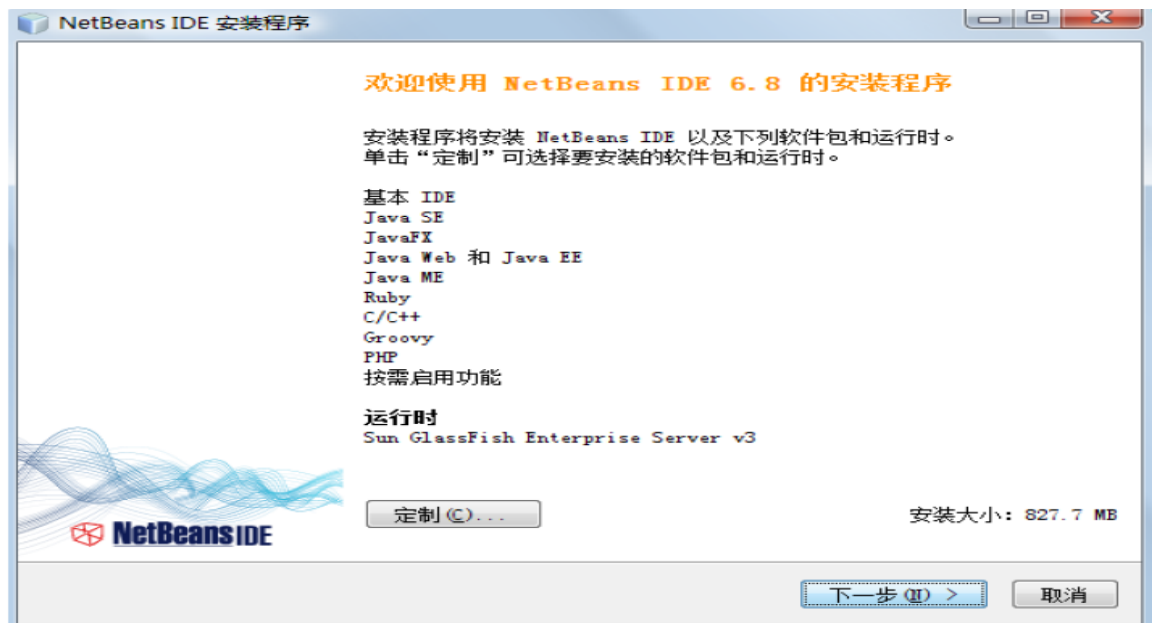


Figure 2.8: The Installation of NetBeans IDE

However, before the Netbeans software's installation, another tool Java Development Kit needs to be installed in the PC. Java Development Kit enables the Java compiler and the application to create Java Archive files (jar.exe). Without it, a compiler cannot create applications for the mobile devices.

3 SOCIAL NETWORKS

3.1 Definition of Social Networks

The social network defines the views of social relationships in terms of network theory combined of nodes and ties, including friendship, kinship, common interest, financial exchange, dislike, sexual relationships, or relationships of beliefs, knowledge or prestige. Nowadays, social network analysis has become a core technique in modern sociology, which emerges knowledge from anthropology, biology, communication studies, economics, geography, information science, organizational studies, social psychology, and sociolinguistics. Figure [4] shows an example of a social network diagram.

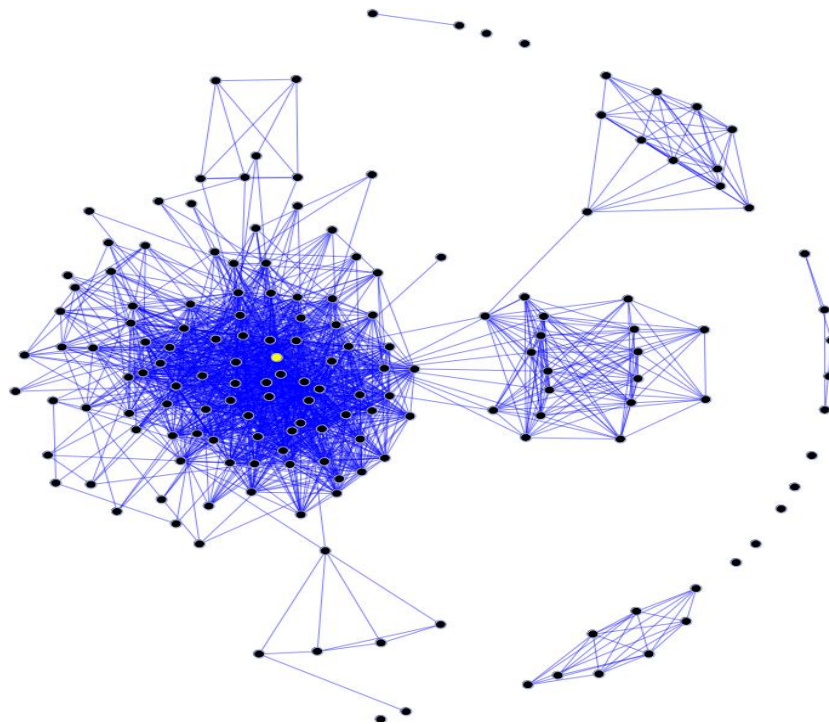


Figure 3.1: An example of a social network diagram. The node with the highest between centrality is marked in yellow. [4]

In sum, social networks have affect many levels and it includes problems are solved, organizations are run, and the degree to which individuals succeed in accomplishing their

goals in determining the way. Simply, the results of social network analysis are from whole to part, from structure to relation to individual, or from behavior to attitude.

3.2 social network data

The social network data can also be described and understood using the ideas and definition of more familiar methods, like cross-sectional survey research. That means the social network data is still very important in social network analysis. In my cause, I will use social network data to represent my relationship information. Although the social network analysis has become an analytic approach to a paradigm, with its own theoretical statements, methods, social network analysis software, and researchers, the social network still is necessary in the that field.[37]

On the other hand, the data sets that social network analysts develop usually end up looking quite different from rectangular data array so familiar to survey researchers and statistical analysts, like people directly perceived through the senses. The social science data is consists of a rectangular array of measurements. A simple example is shown as Figure 3.2 [5]. Each cell of the array then describes the score of some actor (row) on some attribute (column). [37]

<i>Name</i>	<i>Sex</i>	<i>Age</i>	<i>In-Degree</i>
Bob	Male	32	2
Carol	Female	27	1
Ted	Male	29	1
Alice	Female	28	3

Figure 3.2: Example of rectangular data array [5]

In my final project, it will use rectangular data array (also called "conventional data.") to represent my database. The biggest advantage of rectangular data array is easy to read and

write. At the same time, in my application, the first step is storing the relationship information.

The social network data also has other kinds of data. For example, the “Network” data, that consists of a square array of measurements. A simple example is shown as Figure 3.3 [6], which describes the network of friendship relations among four people. Compare with “conventional data”, it is more complicate. The major difference between conventional and network data is that conventional data focuses on actors and attributes; network data focus on actors and relations. [37]

Who reports liking whom?				
	Choice:			
Chooser:	Bob	Carol	Ted	Alice
Bob	---	0	1	1
Carol	1	---	0	1
Ted	0	1	---	1
Alice	1	0	0	---

Figure 3.3: Example of square array of network data [6]

3.3 Using graphs to represent social relations

Social network analysts use two types of tools from mathematics to represent information about patterns of ties among social actors: graphs and matrices. In my application, I will use graphs (circle) to represent social relation. The advantages of using graphs is that you can display data in the simplest way possible without having too many numbers to confuse people, and also you can record comparison between two or more things, or objects. The graph beautiful and neatly constructed diagrams/charts are more attractive

than simple figures. Thus, making comparison is made easy and it will save time of the user to make quick comparison of large data. [37]

3.3.1 The types of graphs

In mathematics, a graph is an abstract representation of a set of objects where some pairs of the objects are connected by links. Figure 3.4 [7] shows the types of graphs and these also are listed in Table 3.1. [37]

Table 3.1 The list of the types of graphs

Undirected graph	A graph in which edges have no orientation
Directed graph	A directed graph or digraph is an ordered pair
Mixed graph	A mixed graph G is a graph in which some edges may be directed and some may be undirected.
Multi-graph	A loop is an edge (directed or undirected) which starts and ends on the same vertex.
Simple graph	A simple graph with three vertices and three edges. Each vertex has degree two, so this is also a regular graph.
Weighted graph	A graph is a weighted graph if a number (weight) is assigned to each edge.
Half-edges, loose edges	A graph is even necessary to have edges with only one end In exceptional situations

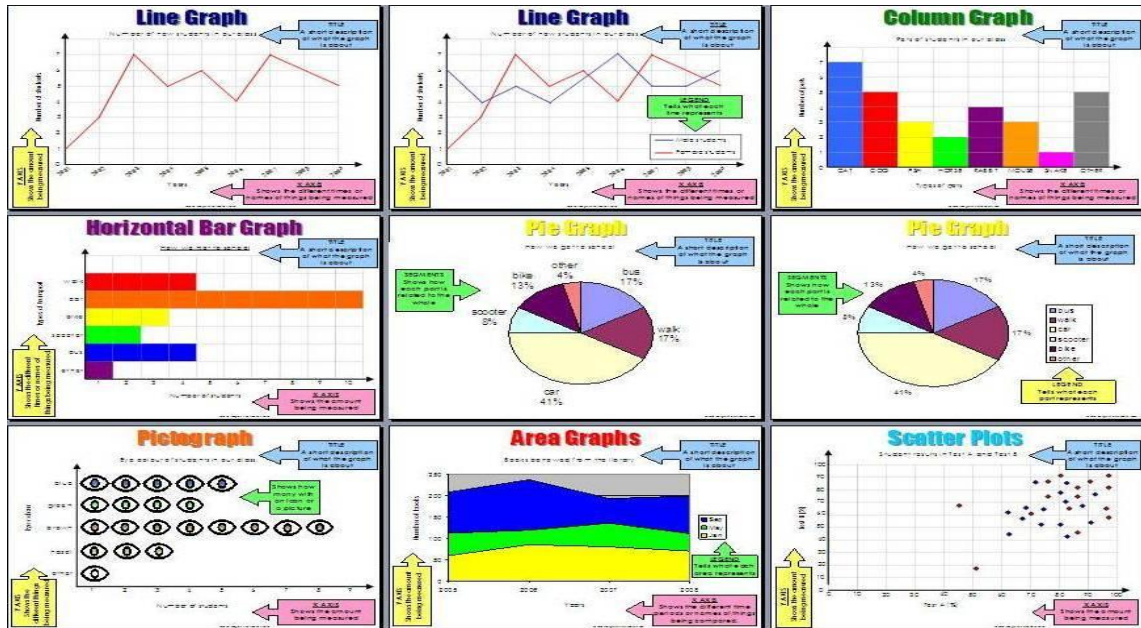


Figure 3.4: The types of graphs I [7]

3.3.2 Graphs and Sociograms

There are a large number of different kind types of "graphs", such as bar-charts, pie-charts, line and trend charts, and many other things. Social network analysis uses one kind of graphic display that consists of nodes to represent actors and lines to represent ties or relations. [37]

In my project, the relations of social will use some circle for each actor in the population we are describing. . We would begin by representing each actor as a "node" with a label (sometimes notes are represented by labels in circles). Figure 3.5[8] shows a graph with four labeled nodes, almost similar result with my project displayed. [37]

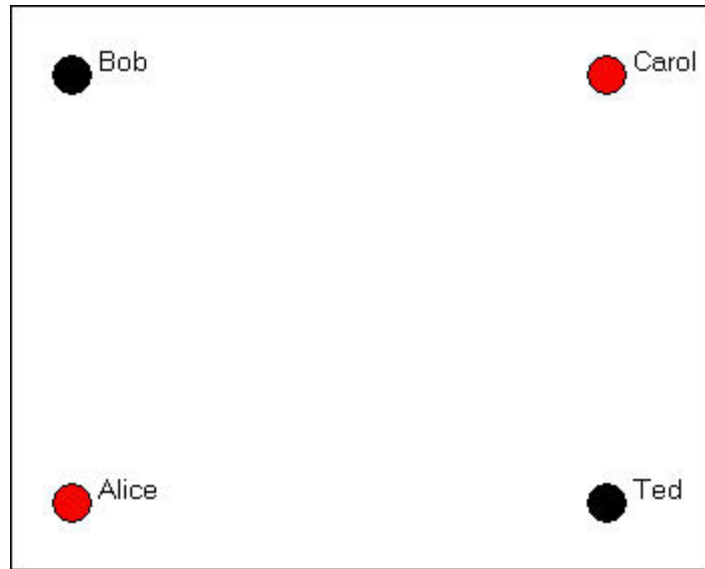


Figure 3.5: The types of graphs II [8]

3.4 Social network analysis software

My project belongs social network analysis software that is identified, represent, analyze, visualize, or simulate nodes. It is also display relationships from various types of data, including mathematical models of social networks. The data of my application mainly come from text file, and then through graphics to display the network structure to user.

Nowadays, there are many kinds of social network analysis tools and libraries (Software), for example, AllegroGraph in which is the input used Graph Database. RDF with Gruff visualization tool, and the output used RDF; Plotonic as a social network analysis tool, the input is used keywords/phrases, and the output is used graphics, text; Comparison with some famous social network analysis software, for my application, I will used txt file as my input, the graphics as my output.

Recently, the build social network analysis software became main part of software apartment. A large amount of programmers work in there. Because our life was more and more need social network analysis, or research how to analyze social already became one important career. Thus, the Social network analysis software came out.

3.5 The history of the social network analysis with graphics

In 1932-1934, Jacob Moreno was the first to use visual images to display the patterning of linkages among social actors in which each was represented by a point, and each link was shown by a line connecting a pair of points. One of his earliest images (Moreno 1932) is reproduced as Figure 3.6 [9]. He can call the first people used in graphic with social network analysis. [38]

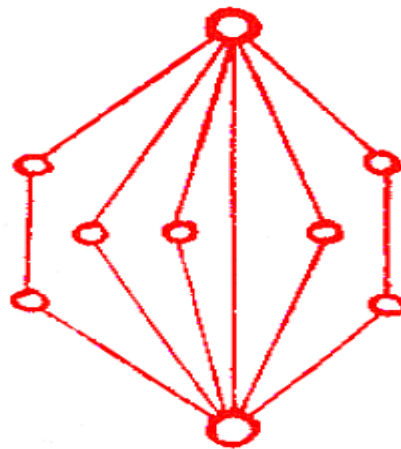


Fig. 4

Figure 3.6: the types of graphs III [9]

Turn to 2010, accompany with the social network fast development. The social network was became hot topic. At the same time, the graphic also became one key point of the social network successful. Even the design graphic became individual apartment. A lot of experts or specialist only work for graphic design. The social network is not only to represent the social network analysis developing, but also is making the economy increase. Social media is product made in the developing of the social network. [38]

3.6 Social Media in Business

Nowadays, millions of people and companies used social media sites daily, such as Facebook, Twitter, and so on. It trends that the social media will be more and more popular in the social field in the future. According to the official static, the Chinese RenRen[10] network was already with more than 22 million active users and an estimated 40 million users who have registered their real names just for two years, and the as of July 2010 Facebook has more than 500 million active users, which is about one person for every fourteen in the world. Social media are media for social interaction, using highly accessible and scalable publishing techniques. To my mind, how to make the social media successful which in one of the key components in successful social media marketing implementation is building "social authority". Social authority is developed when an individual or organization establishes themselves as an "expert" in their given field or area.



Figure 3.7: The logo of RenRen Social Network [10]

Social media uses web-based technologies to turn communication into interactive dialogues. For the computer scientists & Telecom engineers, the social media is an exemplary application of Internet technology. Social Media in Business is for key stake holders, policy makers who understand a fundamental shift is taking place in how corporate communicate. For the Business researchers, the social media is implications for

a firm and industry value chain. And also, social media for IS and social scientists, is adoption and use of the system, and changes in the society.

In the business field, I have my own opinion that as social media, someone is only for location social, such as Chinese RenRen only for Chinese market, and someone is for over the world, like Facebook users from the each corner of the world. So as an IT engineering student, if in the future I will do some business, or some IT works with social media, I will consider the location website function's important.

There are three kinds of market in the internet business, we also can call eBusiness. The ebusiness encompasses the entire world of internal and external electronically based activities including eCommerce. And the eCommerce is digitally enabled commercial transactions between organizations and individuals. So it includes globalization, internationalization, and localization. A truly globalized website serves every visitor with the same quality experience regardless of location, language, business practices, or cultural issues. (Izar.com, 2002) Internationalization refer to having a single design that can be used worldwide. It is the process and philosophy of making website portable to other locals. Localization refers to making an adapted version of the internationalized design for a specific locale. (Nielsen, 1999) Localization involves the process of adapting linguistic and culture content to specific target audiences. (Nielsen, 1999) These three components are necessary to know someone who wants to build social website with business.

Finally, how social media culture and social networking platforms are having a major impact on business communication, practices and processes; how can these tools be utilized, how can you employ strategies within your company to increase profitability, sustain reputation and empower your employees to be brand ambassadors. These points already became the key component of each social business plan so that these companies will examine how all steps to work in the future as their first thing. About the future of social media, it's impossible to think, or brands will have a unique single role on social media, but each brand will need to find its own way of "being social" to be really relevant

to people. So that I think that the value of a Facebook fan is zero according to the social media development, or at least unless you do something with them. And also I think that the social media will not only concern individuals in the futures, but more companies will join the social media. Like Bill Gate said “the social media is the best advertisement”.

4 DESIGN JAVA APPLICATIONS WITH DEMONSTRATING SOCIAL NETWORK

4.1 Building the Programming Environment

In my cause, I used the NetBeans IDE 6.8 as the programming environment. It can be downloaded on the website www.netbeans.org without any charges. I chose the Chinese language as the preferred language since it is more convenient for me.

To install Java Development Kit (JDK 6) is also necessary for Java SE programming. It is related to the process of Java compiler and application, enabling us to build the Java Archive Files automatically.

Firstly, I will describe how to instill JDK 6 in the computer for Microsoft Windows. Because I have introduced how to install NetBeans, to develop Java applications and applets, you need the JDK (Java Development Kit), which includes the JRE (Java Runtime Environment). You can directly download JDK6 from ORACLE officially website since it is free and open source, that shows on Figure 4.1[11].

SDN Home > Download Center >

Java SE Development Kit 6u22

Provide Information, then Continue to Download

There is more information on the available files for download on the [Supported System Configurations](#) page.

Select Platform and Language for your download:

Platform:

Language: Multi-language

By selecting 'Continue' below, you hereby accept the terms and conditions of the [Java SE Development Kit 6u22 License Agreement](#).

Optional: Please Log In or Register for additional functionality and [benefits](#).
Or, click "Continue" now to proceed without Log In or Registration.

User Name:

Example: jim23 or jim@company.com

Password:

- » [Register Now](#)
- » [Why Register?](#)
- » [Forqot User Name or Password ?](#)

[Continue »](#)

Figure 4.1: Downloading JDK6 [11]

Then, you can follow your own computer operating system to choose which version suitable for you. After that, the downloading of JDK6 is running, then to your save place. When you finish all the preparing work, then you can start to use NetBeans.

4.2 Creating a project

Before your programming start, you should choose which programming environment you need from NetBeans as the first step. I selected Java Application of Java as my programming environment, which shows on Figure 4.2.

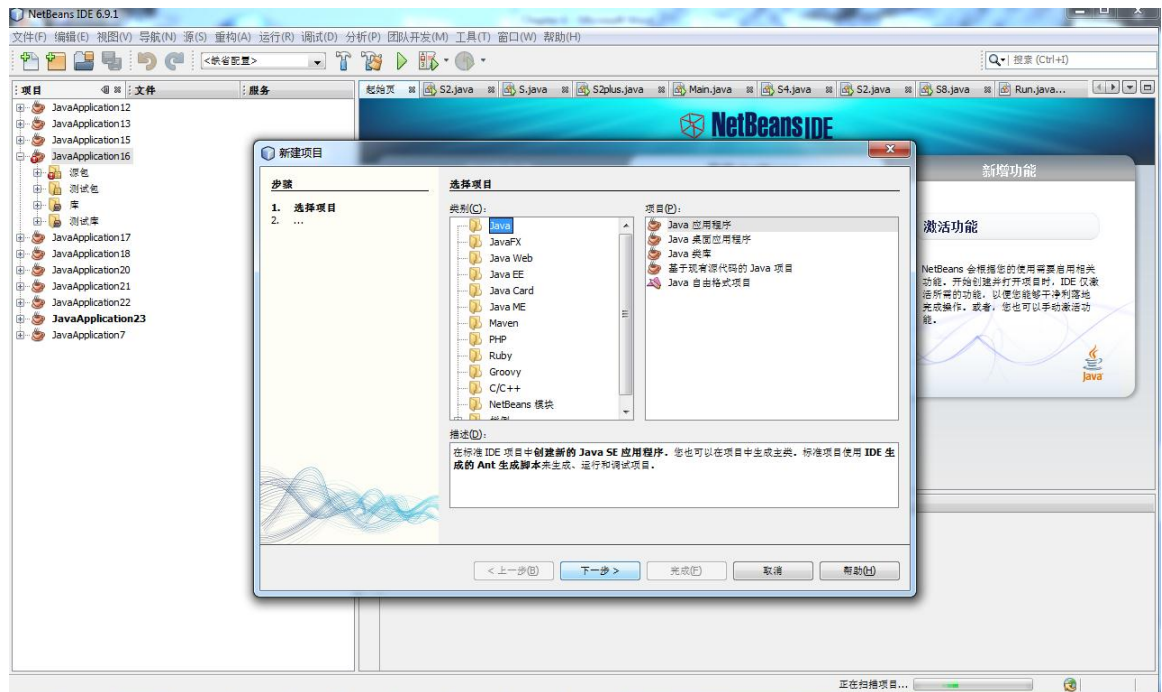


Figure 4.2: The platform of my application

Meanwhile, you can start your programming with NetBeans. There are three main programming parts of my application. The first one is about use Java drawing circle, the second one is about use Java to read file during my requirement, and the third one is about to build one platform to read, or write text file, and according that to show social network structure(Circle) to user.

4.3 The Java with graphics

The Graphic objects drawing with Java, you draw lines, shapes, characters, and images to the screen inside you applet. Simply, through my read book, I knew that most of the graphics operations in Java are methods defined in the graphics class. (The Graphic class is part of the java.awt package.) [36]

All the drawing methods have arguments representing endpoints, corners, or starting locations of the objects as values in the applet's coordinate system.

In my application, I programmed code to draw circle with Java, that as my first program to test the platform. Figure 4.3 shows the result of drawing circle. And the source code is listed below.

Code:

```
package javaapplication7;
import java.awt.Frame;
import java.awt.Graphics;
public class S extends Frame{
    private int x;
    private int y;
    private boolean drawOval;
    public static void main(String []args)
    {
        new S().print();
    }
    public S()
    {
        x = 200;
        y = 200;
        drawOval = false;
        this.setSize(400,400);
        this.setVisible(true);
    }
    public void print(){
        drawOval = true;
        repaint();
    }
    @Override
    public void paint(Graphics g)
    {
        g.drawString("Timo",225,240);
```

```
g.drawString("Matti",150,150);  
g.fillOval(100,100,50,50);  
if(drawOval)g.fillOval(x,y,30,30);  
}  
}
```

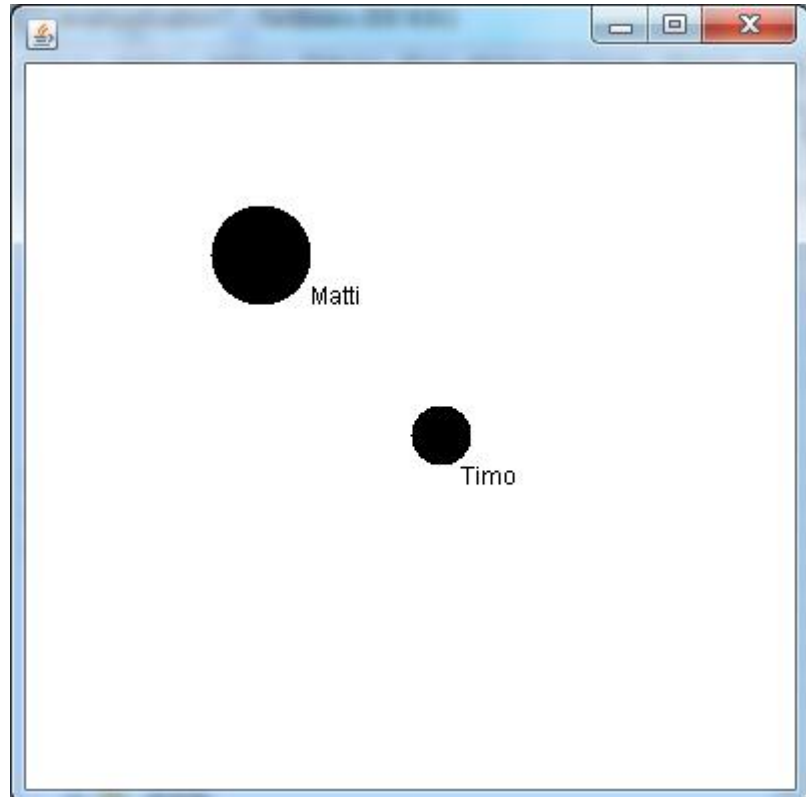


Figure 4.3: Using Java to draw circle

In this code, I used two kinds of Java package, including `java.awt.Frame` and `java.awt.Graphics`. In frame of my application, I set the displayed screen size (400, 400), and then following my handling code to draw circle to display that screen.

Additionally, we can use images when we do graphic objects drawing with java. We can getting them from the server, then loading them into java, and displaying then in your applet. And we can create animations by using images. In the simple words, Animations

in Java involves two steps, the first step is constructing a frame of animation and the second step is asking Java to paint that frame.

4.4 File handling in Java

The file handling in Java means use my application to read, or write text file. Normally, the main write and read file methods are: [36]

❖ InputStream class defines the following methods for reading bytes:

int read() throws IOException

int read(byte b[]) throws IOException

int read(byte b[], int offset, int length) throws IOException

Subclasses of InputStream implement the above mentioned methods.

❖ OutputStream class defines the following methods for writing bytes:

void write(int b) throws IOException

void write(byte b[]) throws IOException

void write(byte b[], int offset, int length) throws IOException

Subclasses of OutputStream implement the above mentioned methods.

❖ The example below illustrates code to read a character:

//First create an object of type FileInputStream type using the name of the file.

```
FileInputStream inp = new FileInputStream("filename.ext");
```

//Create an object of type DataInputStream using inp.

```
DataInputStream dataInp = new DataInputStream(inp);
```

```
int i = dataInp.readInt();
```

In my application, the information is stored in a text file and my application is able to write and read this file. The Figure shows the structure of my txt. File. Simply, this is used for storing the social network relationship information.

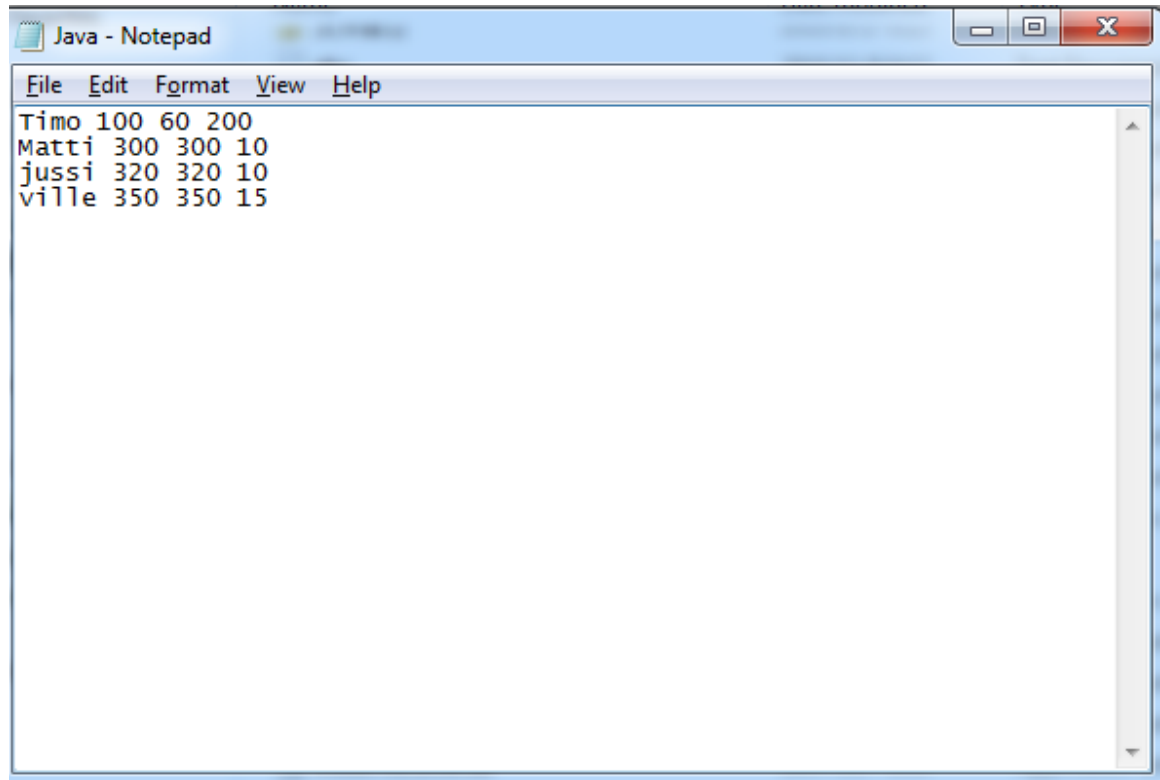


Figure 4.4: The structures of my .txt file

In the method read/write file, I used five Java packages that includes `java.io.BufferedReader`, `java.io.File`, `java.io.FileReader`, `java.io.FileNotFoundException`, and `java.io.IOException`. The program will read the .txt file line by line, even the number one by one. For example, in the first line of Figure 4.4 reading method, it will read Name Timo first, then according my setting after one space will read next number.

The sequence of read code is written as below.

Code:

```
try
{
    reader = new BufferedReader(new FileReader(file));
    String text = null;
```

```
String text2 =null;
int pos=0, old_pos=0;
int pos1=1, old_pos1=1;

int x;
int y;
int size;
    while ((text = reader.readLine()) != null)
    {
pos = text.indexOf(' ',old_pos);
text2 = text.substring(old_pos, pos); // NAME IS text2
System.out.println("Name should be text2 ");
System.out.println(text2);

old_pos=pos+1;
pos = text.indexOf(' ',old_pos);

text2 = text.substring(old_pos, pos); // the first number is text2
x = Integer.parseInt(text2); // convert it to integer
System.out.println("First number should be x now but we add 1000 to it ");
System.out.println(1000+x);

old_pos=pos+1;
pos = text.indexOf(' ',old_pos);
text2 = text.substring(old_pos, pos); // the second number is text2
y = Integer.parseInt(text2); // convert it to integer
System.out.println("Second number should be y now but we add 1000 to it ");
System.out.println(1000+y);

old_pos=pos+1;
pos = text.length();
```

```

text2 = text.substring(old_pos, pos); // the third number is text2
size = Integer.parseInt(text2); // convert it to integer
System.out.println("Third number should be size now but we add 1000 to it ");
System.out.println(1000+size);

System.out.println("X: ");
//System.out.println(text2.length());
System.out.println(x);

System.out.println("y: ");
System.out.println(y);

System.out.println("size: ");
System.out.println(size);

text =null;
pos=0;
old_pos=0;

```

The code reads a text file, stores the information into an array then displays the contents on the screen when I run the code. To the write file part, I programmed that into the platform part. During this step, it is possible to make when I will draw circle in my application, then the circle data can be load my read from the .txt file, or without handing code in drawing circle step.

4.5 The platform to display network structure

Actually, the platform is consisting of file hand and draw graphic with Java. But in my platform, I added one more functions which are writing .txt file with Java, and run to show the social networks relationship, etc. Figure 4.5 shows my running platform.

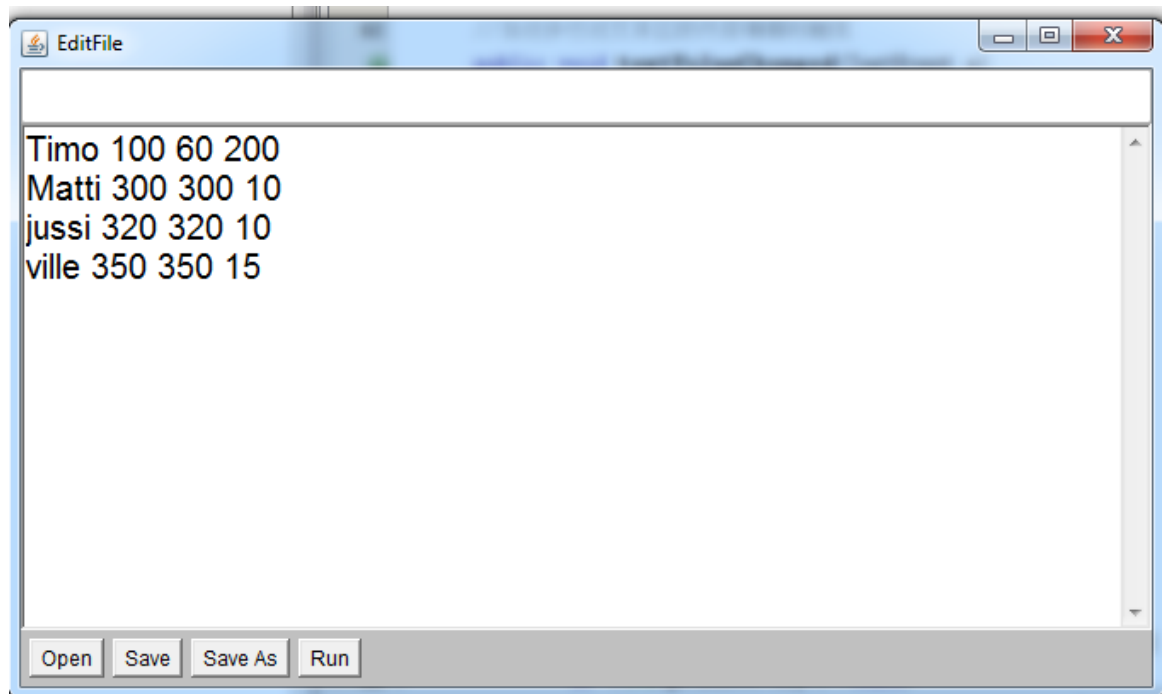


Figure 4.5: My application platform

In this part, I programmed four buttons to implement the final operating, including Open, Save, Save As, and Run. Through Open button, I can read file. Both of Save and Save As, I can write file. The Run button is used to demonstrating social networks relationship. Mainly, I want to introduce how to program write file. In the write file, you have to set writing line in your code in your project. The heart of writing file blow.

Code:

```
{
    try
    {
        FileWriter fw = new FileWriter(file1);
        fw.write(ta1.getText());
        fw.close();
        b2.setEnabled(false);
        b3.setEnabled(false);
    }
    catch (IOException ioe)
```

```
    {  
        System.out.println(ioe);  
    }  
}  
  
@Override  
public void windowClosing(WindowEvent e)  
{  
    System.exit(0);  
}
```

However, there are three keys in my project, including, draw graphics, read file, and write file. All of them are very important and necessary. At the same time, especially, in the platform part, how to design your button, which way will show your final result, and how can you make your code, or structure be perfect also in this part etc. So that all of them you need think about.

5. IMPLEMENTATION AND TESTING OF MY PROGRAM

5.1 The introduction of my program

Before implement my application, the first, I combined with my three parts of codes into one application project. Then I need created a good structure for merging them. I put platform part as my main code. I can write and read .txt file in that platform as social networks relationship information. Meanwhile, that load and save the .txt file where I can choose. Then put the reading file and drawing circle code into the “Run” button of main code. So that when click “Run” button that will display the social network structures in the screen (circle) in which data from the .txt file.

5.2 Testing of my program

The first of all, I tested my platform work that shows on Figure 5.1. It shows I typed the relationship information to platform, then to store in my own computer desktop and the .txt name is Example 1. The implementation worked by “Save”, or “Sava As” button. The information data listed Table 5.1.

Table 5.1 The list of my information data

Timo 100 60 200
Matti 300 300 10
jussi 320 320 10
ville 350 350 15

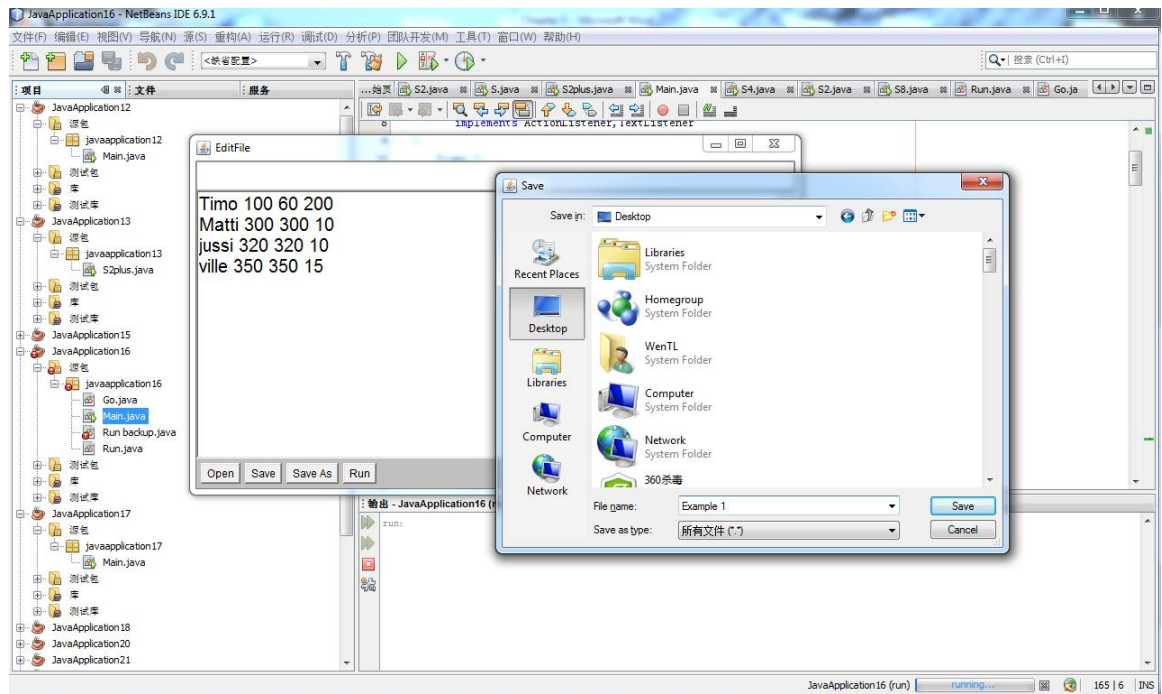


Figure 5.1: The tests of writing file

According to the result, it proved that test was successful. My application can save correct information into .txt file on my computer desktop. This step is work for we can directly type our own information data to use application analysis.

The second step, I tested my application to read file. Then I will read file from my own computer D disk and the .txt name is Java. That shows on Figure 5.2 [22]. This step is for when we want to analyze social networks data from others, and then we can directly to read their file.

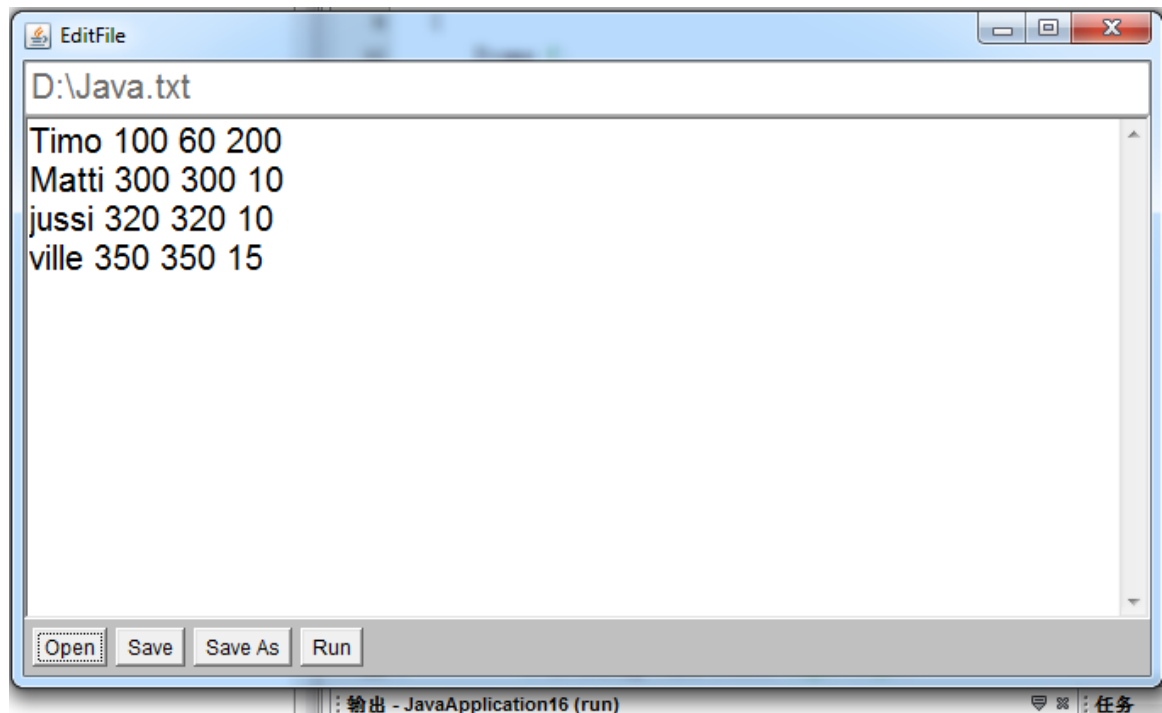


Figure 5.2: The tests of reading file

Just click “Open” button, select Java.txt from D disk, then will result in the screen same with Figure 5.2 show. That step was successful, that can read file form accurate place and correct information.

The third test was I will use data to demonstrate social network relationship with circle to analyze in which the data from the step 2. This step shows on Figure 5.3. For this step, I want to make sure the purpose of my application is successful, or not. And this is the most important test. After I read the relationship information data, then click “Run” button to test.

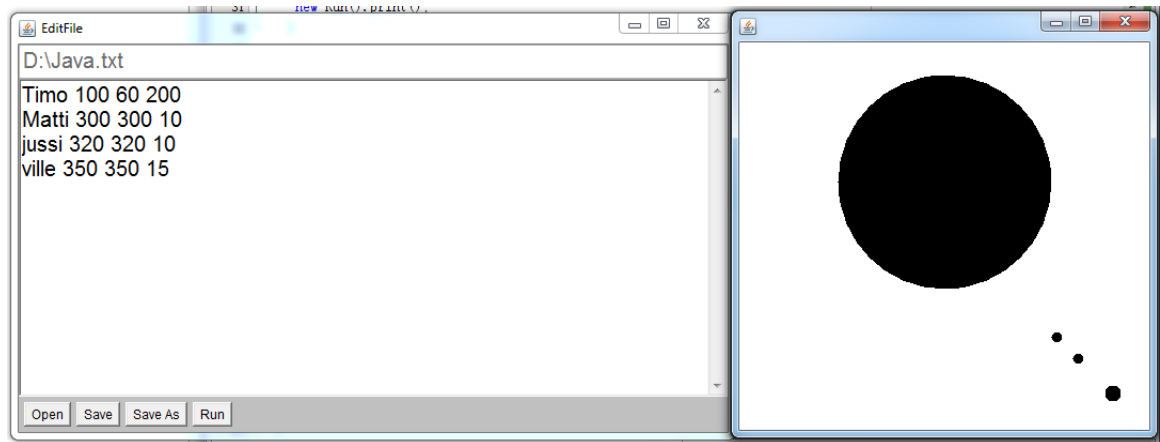


Figure 5.3: the tests of display network structure

All of them were successful in my test. The four circles respectively and clearly represent the social network structure. And the data are also respectively form D disk and the name is Java.txt, then one by one to read.

Since my three tests, almost can prove my application can run. And also I satisfied and excited with my three tests results. We can directly from size of circle to analyze per person situation and know their data.

5.3 Implementation of my program

In this part, I want to totally and completely implement all process of my program. The first of all is writing data to save in my computer through my application. The second is read just saved data to my platform. Finally, click “Run” button to show the network structure in the screen from where I read from that .txt file. These Figure 5.4, Figure 5.5, and Figure 5.6 show all the process.

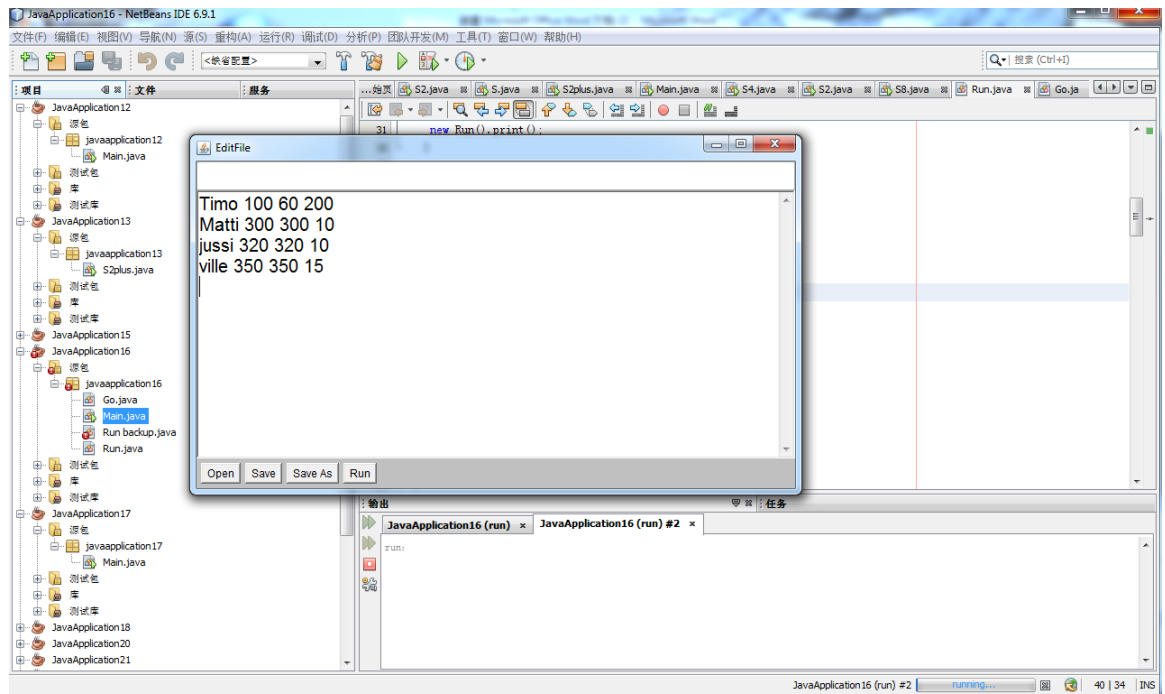


Figure 5.4: The first step of implementation of my program

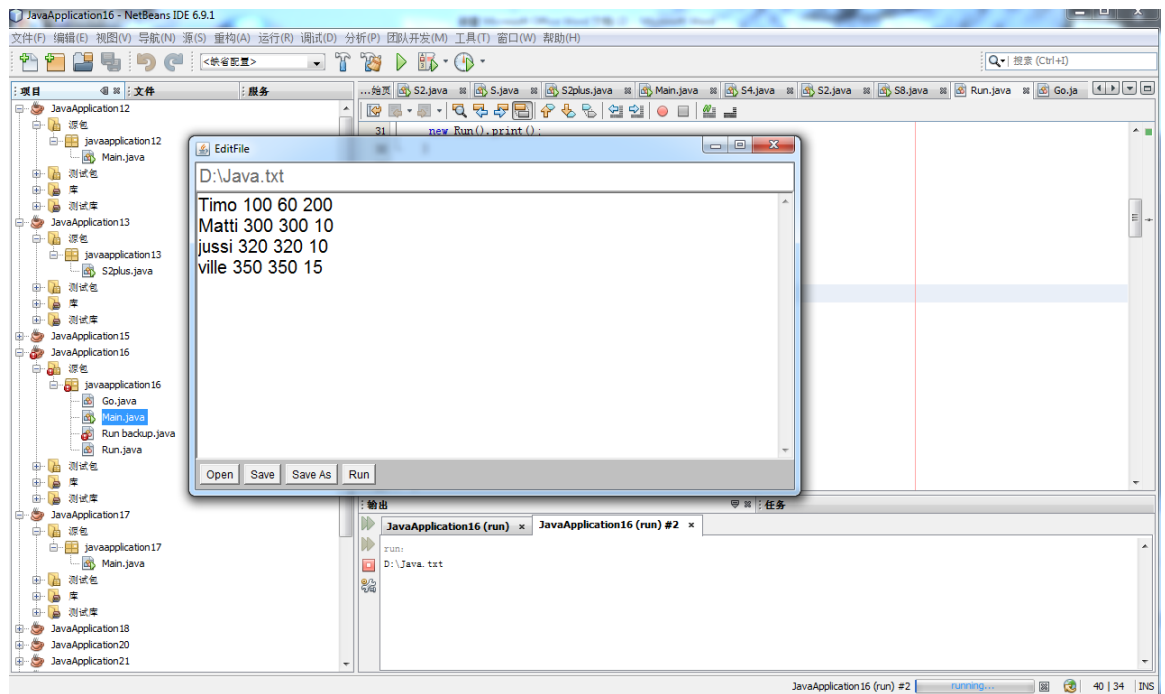


Figure 5.5: The Second step of implementation of my program

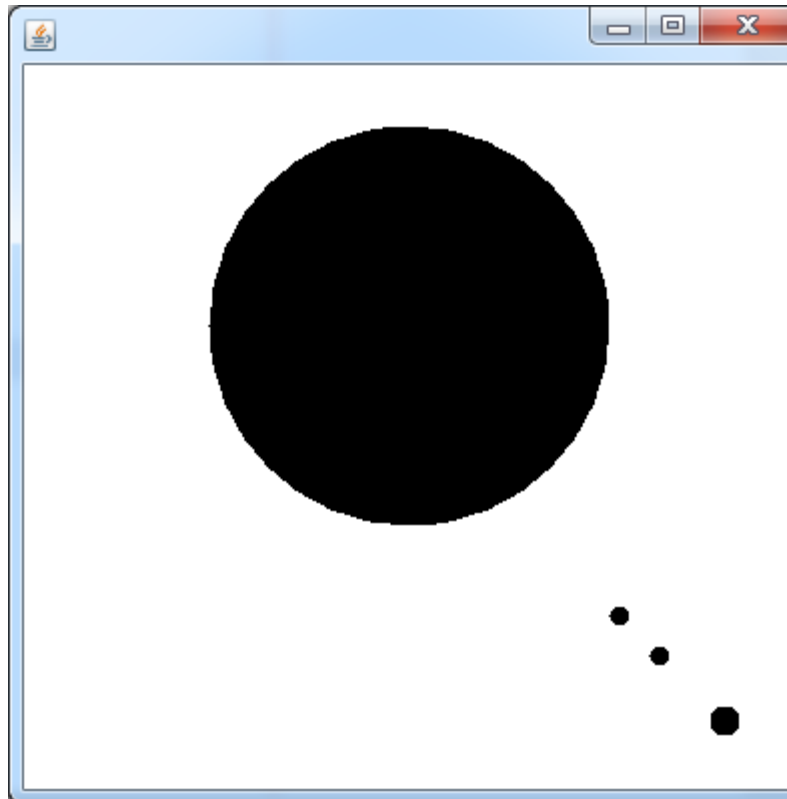


Figure 5.6: The Third step of implementation of my program

5.4 The future prospect and challenges of my application

In process of my project, I thought about my project future. To my mind, as two “hot” topics combination, I am looking forward to they have very good future. So that means my application can continue to improve. I have some ideas about my application, such as I can program a real application to analyze result, like can be used line to represent their relationship. The example shows on Figure 5.7 [12].

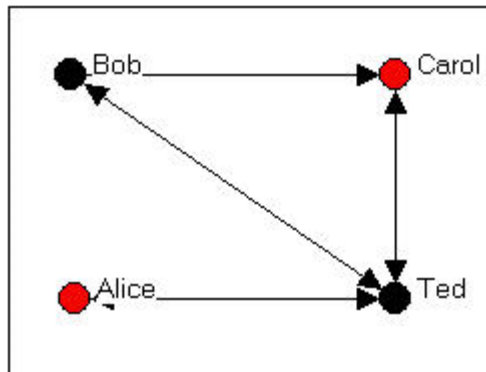


Figure 5.7: The example of my program prospect future [12]

At the same time, I also faced a lot of challenges in process of my application. For example, I combined three parts of code into one that was big challenge. Because of that, I finally knew that one good structure how important in the programming. The second, how to set read file sequence also was challenge. So that I have to consider how the read file cans sequence totally matched with .txt file structure. A number of challenges faced to me during the final project period. However that was perfect and interesting experience.

6 CONCLUSIONS

6.1 Conclusion

The aim of the study was how to demonstrate social networks relationship with graphic in Java application. Specifically, it is storing the relationship information, then to display the social network structure to the user. The programming was done on the Java 2 SE platform and possibly with Java Action Script. The application test was successful on my Java application.

In general I am satisfied with my work and results. The feedback I have received is mainly positive, but some details of my programming part still can improve. The process of my work was useful, and then makes me to think about in possible future Java programming and social network positions accurately, and I significantly improved my professional skills in Java programming language in the future.

During my project, I learned what social network is, and how to program with Java EE. First as base for my work, I read a large number of books about social network and Java EE programming. The most useful books I found from Mastering (Java 2 J2SE 1.4) and teach yourself Java in 21 days where I took many examples to processed in my Java application. At the same time, I got a lot of new knowledge and experience from my project. That is the most important for me.

However, the process of building a Java EE application with social network was very exciting as well as very challenging. It was a very important and interesting experience. Finally, I believe that in my further professional life I can make use of the skills acquired during this project.

6.2 Future prospect of social network with Java

Nowadays, the trend is that more and more software are now embedded into the social network analysis. The Java as one main programming language, it has to build software with social networks by Java. So the social network is very “hot“topic now and Java was/is very popular in IT software field. I believe the combination with both of them that it must be has very good future. Firstly, I was lucky to choose this project topic to study. Then, may be in the future, my job will be relation with my project. Fortunately, I got this chance to learn important experience.

Increase with social work developing, as an IT student, I strongly believe more work opportunities with social network. As business, this is very big markets waiting them.

REFERENCES

[1] **Wikimedia 2010.**

<URL http://upload.wikimedia.org/wikipedia/en/thumb/3/39/Java_logo.svg/200px-Java_logo.svg.png>

[2] **Wikimedia 2010.**

<URL <http://upload.wikimedia.org/wikipedia/en/5/58/JavaPlatform.png>>

[3] **Filebuzz 2011.**

<URL http://www.filebuzz.com/files/Sloc_Eclipse/1.html>

[4] **Wikimedia 2010.**

<URL http://upload.wikimedia.org/wikipedia/commons/0/05/Sna_large.png>

[5] **Faculty 2011.**

<URL http://faculty.ucr.edu/~hanneman/nettext/C1_Social_Network_Data.html>

[6] **Faculty 2011.**

<URL http://faculty.ucr.edu/~hanneman/nettext/C1_Social_Network_Data.html>

[7] **Imaginativeteacher 2011.**

<URL <http://www.imaginativeteacher.com/Numeracy.html>>

[8] **Faculty 2011.**

<URL http://faculty.ucr.edu/~hanneman/nettext/C3_Graphs.html>

[9] **Moreno 2011.**

<URL <http://moreno.ss.uci.edu/86.pdf>>

[10] **Chinabusinessmarketing 2011.**

<URL

<http://www.chinabusinessmarketing.com/blog/wpcontent/uploads/2010/08/renren-xiaonei.jpg>>

[11] **SUN 2011.**

<URL https://cde.sun.com/is-bin/INTERSHOP.enfinity/WFS/CDS-CDS_Developer-Site/en_US/-/USD/ViewFilteredProducts-SingleVariationTypeFilter >

[12] **Wikipedia 2011.**

<URL http://en.wikipedia.org/wiki/Java_%28programming_language%29>

[13] **Wikipedia 2011.**

- <URL http://en.wikipedia.org/wiki/Java_Platform,_Standard_Edition>
- [14] **Oracle 2011.**
- <URL <http://www.oracle.com/technetwork/java/javase/tech/index.html>>
- [15] **Wikipedia 2011.**
- <URL http://en.wikipedia.org/wiki/Java_Development_Kit>
- [16] **Oracle 2011.**
- <URL <http://download.oracle.com/javase/6/docs/technotes/tools/index.html>>
- [17]<URL <http://java.sun.com/javase/technologies/tools.jsp>>
- [18] **Wikipedia 2011.**
- <URL http://en.wikipedia.org/wiki/Software_development_kit>
- [19] **Wikipedia 2011.**
- <URL http://en.wikipedia.org/wiki/Java_%28software_platform%29>
- [20]<URL <http://qt.nokia.com/>>
- [21] **Wikipedia 2011.**
- <URL http://en.wikipedia.org/wiki/Eclipse_%28software%29>
- [22] **Eclipse 2011.**
- <URL <http://www.eclipse.org/org/>>
- [23] **Genuitec 2011.**
- <URL <http://www.genuitec.com/products.html>>
- [24] **Wikipedia 2011.**
- <URL <http://en.wikipedia.org/wiki/NetBeans>>
- [25] **Netbeans 2011.**
- <URL <http://netbeans.org/features/java/javase.html>>
- [26] **Findtarhet 2011.**
- <URL <http://reference.findtarget.com/search/Social%20network/>>
- [27] **Wikipedia 2011.**
- <URL http://en.wikipedia.org/wiki/Social_media>
- [28] **Wikipedia 2011.**
- <URL <http://en.wikipedia.org/wiki/Renren>>
- [29] **Wikipedia 2011.**
- <URL <http://en.wikipedia.org/wiki/Facebook>>

[30] **Faculty 2011.**

<URL http://faculty.ucr.edu/~hanneman/nettext/C1_Social_Network_Data.html>

[31] **Faculty 2011.**

<URL http://faculty.ucr.edu/~hanneman/nettext/C3_Graphs.html>

[32] **Wikipedia 2011.**

<URL http://en.wikipedia.org/wiki/Graph_%28mathematics%29>

[33] **MORENO 2011.**

<URL <http://moreno.ss.uci.edu/86.pdf>>

[34] **SUN 2011.**

<URL

https://cds.sun.com/is-bin/INTERSHOP.enfinity/WFS/CDS-CDS_Developer-Site/en_US/-/USD/ViewFilteredProducts-SingleVariationTypeFilter>

[35] **John Zukowski**, (2002), Mastering Java 2, J2SE 1.4, 1, 1-127

[36] **Laura Lemay**, (1996), Teach Yourself Java in 21 Days, 1, 3-111

[37] **Hanneman, Robert A. and Mark Riddle**, (2005), Introduction to social network methods. Riverside, CA: University of California, Riverside (published in digital form at <http://faculty.ucr.edu/~hanneman/>)

[38] **Linton C. Freeman**, (2001), Graphical Techniques for Exploring Social, Network Data, 1, 1-29, Riverside (published in digital form at <http://moreno.ss.uci.edu/86.pdf>)

APPENDICES

```
package javaapplication7;
import java.awt.Frame;
import java.awt.Graphics;
public class S extends Frame{
    private int x;
    private int y;
    private boolean drawOval;
    public static void main(String []args)
    {
        new S().print();
    }
    public S()
    {
        x = 200;
        y = 200;
        drawOval = false;
        this.setSize(400,400);
        this.setVisible(true);
    }
    public void print(){
        drawOval = true;
        repaint();
    }
    @Override
    public void paint(Graphics g)
    {
        g.drawString("Timo",225,240);
        g.drawString("Matti",150,150);
        g.fillOval(100,100,50,50);
        if(drawOval)g.fillOval(x,y,30,30);
    }
}
```

```
    }  
try  
{  
reader = new BufferedReader(new FileReader(file));  
String text = null;  
String text2 =null;  
int pos=0, old_pos=0;  
int pos1=1, old_pos1=1;  
  
int x;  
int y;  
int size;  
    while ((text = reader.readLine()) != null)  
    {  
pos = text.indexOf(' ',old_pos);  
text2 = text.substring(old_pos, pos); // NAME IS text2  
System.out.println("Name should be text2 ");  
System.out.println(text2);  
  
old_pos=pos+1;  
pos = text.indexOf(' ',old_pos);  
  
text2 = text.substring(old_pos, pos); // the first number is text2  
x = Integer.parseInt(text2); // convert it to integer  
System.out.println("First number should be x now but we add 1000 to it ");  
System.out.println(1000+x);  
  
old_pos=pos+1;  
pos = text.indexOf(' ',old_pos);  
text2 = text.substring(old_pos, pos); // the second number is text2  
y = Integer.parseInt(text2); // convert it to integer
```

```
System.out.println("Second number should be y now but we add 1000 to it ");
System.out.println(1000+y);
```

```
old_pos=pos+1;
pos = text.length();
text2 = text.substring(old_pos, pos); // the third number is text2
size = Integer.parseInt(text2); // convert it to integer
System.out.println("Third number should be size now but we add 1000 to it ");
System.out.println(1000+size);
```

```
System.out.println("X: ");
//System.out.println(text2.length());
System.out.println(x);
```

```
System.out.println("y: ");
System.out.println(y);
```

```
System.out.println("size: ");
System.out.println(size);
```

```
text =null;
pos=0;
old_pos=0;
```

```
{
    try
    {
        FileWriter fw = new FileWriter(file1);
        fw.write(ta1.getText());
        fw.close();
        b2.setEnabled(false);
```

```
        b3.setEnabled(false);
    }
    catch (IOException ioe)
    {
        System.out.println(ioe);
    }
}
@Override
public void windowClosing(WindowEvent e)
{
    System.exit(0);
}
```