Programming in Java
Prof. Debasis Samanta
Department of Computer Science and Engineering
Indian Institute of Technology, Kharagpur

Lecture – 59
Case Study – IV

Welcome to the session. In this session we will be discuss few more projects. So, the projects idea actually so that you can work on the projects and then improve your skill so, this is the 8th project in the series of projects that we are discussing in this week. This project is based on the Tic-tac-toe game development. Tic-tac-toe game is very familiar game and you can find some apps also available nowadays in the mobile.

So, that this game is available and then this game can be played between the user and the machine, system, computer. So, one party; one player is user and another player is computer. However, in this game we will discussed about how the game can be played by two users that users; obviously, with their own computer and the two computers the players which they are using the playing the games is connected through the net. So, this is the requirement it is required here.

(Refer Slide Time: 01:34)

Now, let us have the idea about this game. Now, before going to discuss the idea what are the basic skill that is required so that you can cope with this project. Obviously, you should have the good knowledge about Java swing and then little bit graphics also

involved event handling mechanism. So, it is basically GUI programming related issues and the networking concept is required. So, if you have cover all those concepts then you are ready for this project.

(Refer Slide Time: 02:04)

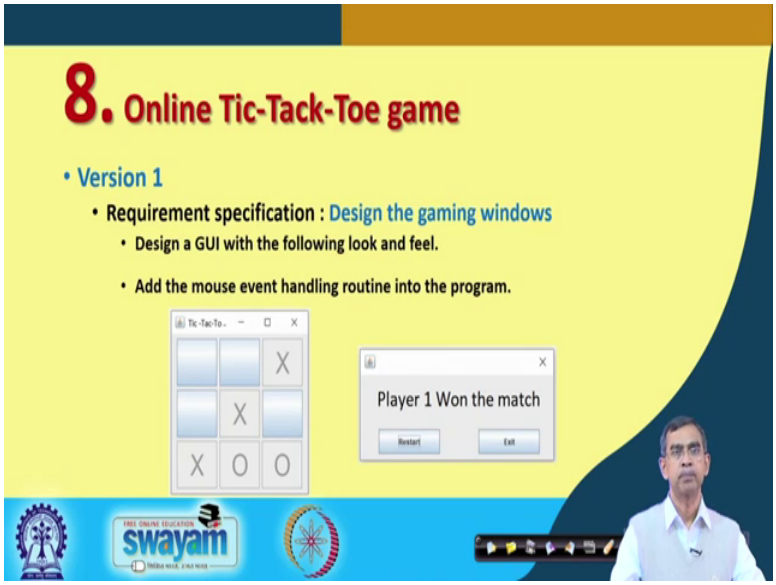
Now, so, the idea about this project; here the idea as we see the tic-tac-toe board as it appears and is a familiar form as it is shown here this is the tic-tac-toe board and there are markings. So, there are two types of marking as you see here; one is marking is cross and another is 0. So, cross markings by one player whereas 0 markings will be indicated by another player. So, as a simple form of this tic-tac-toe game as we see here there is a 3 cross 3 board. There may be some complex version also there 4 cross 4, 5 cross 5 and much more also.

Anyway let us just work with the 3 cross 3, later on if your time permit and if your interest grows then you can extend easily to 4 cross 4 or 5 cross 5. Anyway so, we will consider a 3 cross 3 tic-tac-toe game here. Now, as I have only mentioned that this game will be between two players. Two players will play the game from their machines; the machines are remotely located and of course, the machines are connected through the network.

Now so, two applications therefore, we have to develop, rather two programs we have to develop; two programs we can say the two socket programs more precisely the two socket programs will be executed in to host machines that into machines of the users.

And, then the two games that two socket programs we will learn concurrently; concurringly say the at the same time in the two machines the programs are to be run and then once the program is in execution the user can play the game. And, the game we will continue you can fix a time or the game may be continued until user wants to do so. So, this is the idea about this game.

(Refer Slide Time: 04:22)



Now, let us see how we can deal with this project. Now, we will again follow a step by step incremental procedure so that we can develop this game easily. The first at task is to design the gaming windows as we see it is a frame and this frame includes the you can say 4 fields rather we can say 4 button sort of thing sorry not 4 is a 9 bottom sort of thing and we can easily do this frame work easily the actually. So, this is a very trivial task and this is obviously, the first phase of the projects and in our next part.

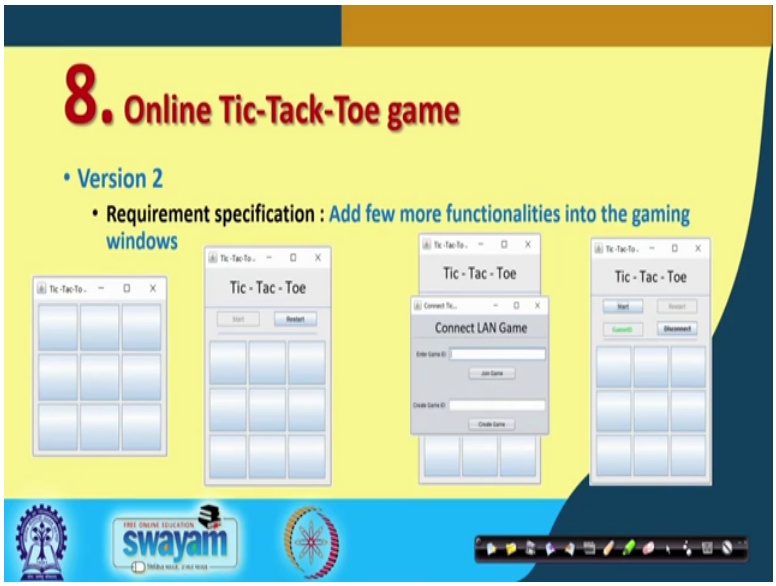
So, the event handling if we say, the even handling will be like this so, people we will select a particular button and then one players selection will be marked with X. So, the other player selection will be marketed as 0 and then it will continue. And, then every times the player will get his own turn to mark the selection and once a player win the game automatically a message box will appear showing that this player A or player B won the match. So, this is the interface that you have to develop first and this is the first version first phase of the program.

(Refer Slide Time: 05:50)

In our second phase of the program, we can say it is the second version of the tic-tac-toe game. Here we have to add few more functionalities into the gaming windows. Now, let us see what are the functionality that can be considered here. So, initially the initial interface is there. Now, after the initial interface there will be a start or stop button; that button can be a toggle button so that once the start then it will be automatically next go to the stop. So, if we will select it automatically that portion will be there. So, if a player wants to start his game so, the player; the start button should be there. And restart means say suppose you want to abandon the game in the mid way then you can follow that a start button.

Now, once the start is there either start after start the restart will be a executable, if it is stop no restart button. So, this is a enabled, disabled depending on the first button that you have selected. Once the start button is selected other than the start and restart or start and stop and restart buttons we have to also around one another initiatives or facilities to connect the user to some other machine; some other users; some other player. So, a connect button will take care for this and disconnected basically if you want to quit the game.

(Refer Slide Time: 07:20)



So, one user; one player click a connect button, then it will pop up an window, so, it basically the game ID. So, your name can be the game ID again. Now, if you are already using then or all or say some user all already working on that then the same game ID can be use. Say suppose player X is already in the field I mean in the active then we can game ID is X actually otherwise if you want to create the game from your side only. So, you can give a your game ID.

Now, that game ID will be available to all the users who are connected in the net and then they can select that they to with home, they want to play all this things. Once the game is created then there is a join option will be there, so that if user can join the game. And then game once the game ID is created it will appear a game ID which is the game ID that we have been created.

So, now, this is the starting of the session of a game from a player sides. So, other player knowing that what are the game ID's available, he can select and then join and then I can start the gaming.

(Refer Slide Time: 08:43)

And this is basically from one side so, one machine, one socket we can say. So, in the; in two sockets that if programs if it is run then the network connectivity we will take care about these execution. So, this is the third version is that you have developed the things in a standalone in a one side only and how the two programs can run concurrently in two different machines and they are connected through the net. So, here networking is required so that all the sockets can communicate among the two between the two players.

Now, as a part of the communication few things that we have to take care about it; so, this tic-tac-toe board should be visible from the continuing the same state of information to both the users. So, initially it is blank no clicking is there, no ticking is there now, say suppose player 1 here and player 2, they are playing the game and player 1 ticks it. So, as soon as his ticking is over, then it will be marked and the same marking also will be visible to the other player as well as.

Now, it is the player turn and here when the player turn is there, the player 1 cannot initiate any move it is not allowed. So, game will take care about this. So, game we will; in you will wait until player to finish his game; finished his turn move. Now, here the again player 2 we will move. So, player 2 we will click and then according to this that click we will appear in his own board as well as the same will be appear in to the other parties board also. So, this will continue and this is the type of the game that you have to implement and definitely the socket programming is required and then GUI

programming is required. These are the two I mean programming aspects are to be exercise in this project.

Now, let us come to the next project. This project is as we have given the title of this project is document browser, you know exactly browser. Browser is basically is a interface right, like say Internet Explorer or say Mozilla or Chrome you know these are the browsers. Now, so Browser basically take a link and based on the link or browser we will take a I mean link and then they will navigate to that link and then it will fetch some things like that.

Also some time browser if it is a search engine like for example, Google then they will take a link as well as they will take some keywords. And then related to the keyword they will search the entire internet and then and whatever the document matches with this keyword they will fetch it to the user. That may be a million of link whatever it is there million of documents is there whatever it is there.

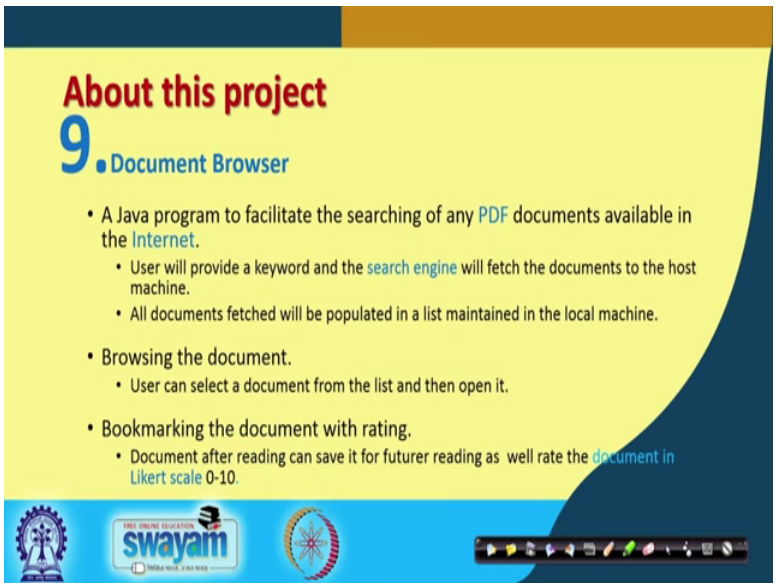
Now, so, there is a search engine, the search engine can be accessed from any program. In fact, there is a little tricks about the tricks can be readily available from the internet if you just take a quick search and then you can find many solution to that. Anyway, I will come to that discussion again in a detail way later on. So, what is the idea about is that a browser will basically browse; browse in the sense that it will surf the net and then retrieve the documents to the say browsers machine or the users machine.

So, user will browse the system. So, here user is a browser and user will browse through an interface. That interface we are going to develop and we term is a document browser. Definitely it will not browse you just want to make it little simple so that we can restrict to a particular kind of documents let it be a only PDF documents. That mean those are the documents available in the net. There is a lot of I mean million of documents, billion of documents are available in the net which are basically in a PDF format. Anyway, so if this document browser will only search the PDF contents those are available in internet, in the www dot w in what is called the World Wide Web link actually there.

(Refer Slide Time: 13:04)

So, this; so, idea about ok so, before coming to this idea what are the concept that it will cover, so far this browser development is concerned Swing is required to be apply to be exercised here and then networking. Obviously, it is there, but this is a simple networking in fact.

(Refer Slide Time: 13:26)



Now, let us come to the discussion over this project it is there. So, here basically you have to develop a java program which will help a user, user is a I mean user means we searching for a document in the net for any PDF documents available. User will provide

definitely a keyword. A keyword can be a group of words or whatever it is there, no issue. So, a keyword maybe say NPTEL course so, this keyword. So, it will be fetched all PDF file related NPTEL course like there.

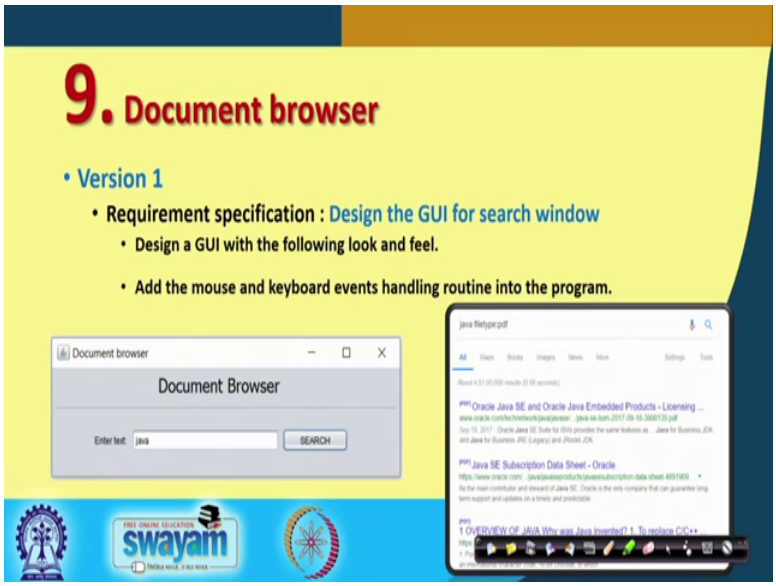
So, anyway so once the user provide a search word; so keywords rather right then your program will search using some search engine and fetch all the documents with matches with the keyword, that is the concept it is there that you have to implement it. All documents fetch will be populated in a list in your in the local machine of the browser.

So, that means, the it is not exactly same as the search engine like Google does for you, it basically give a link of all the document then user has to click with some snippets that is there. However, I am telling is that you can bring it, but we have to process this phase little bit who is basically search engine returns and then get the PDF file, and download these PDF file of your own and then make a list in your own machine. So, this is the extra step that your browser should do or the proposed browser should do.

And then once the list of documents are fetched in to the users machine then a user can select any documents of each choice given the title of all the documents in the listed itself. And, then document needs to be read by the user. Here again some functionalities are to be added here functionalities that document will be open, a document will be marked, a document will be saved, a document will be rated whatever it is there.

So, you are proposing that if the document like say document like anything so, we can give the 10 point and if he does not like at all then it is a 0 point. So, 0 to 10 a Likert scale a document can be rated. And, then this rating can be maintained in the document itself and user can save this document for further reading in future. So, the document will be stored with this rating point and everything. So, these are the things that your document browser will facilitate to the user.

(Refer Slide Time: 15:55)



Now, let us see how we can develop this document step by step. So, first we have to create a simple layout as we have shown here the layout will includes away on simple text field level and then button. So, here the level is basically what is the keyword that you want to supply enter text like and then this is a text field where the keyword that is basically user will provide it and then finally, search. So, whenever if the button will be clicked, it will basically connect to the Google search engine or some other search engine whichever you want to use in your machine and then say this search engine.

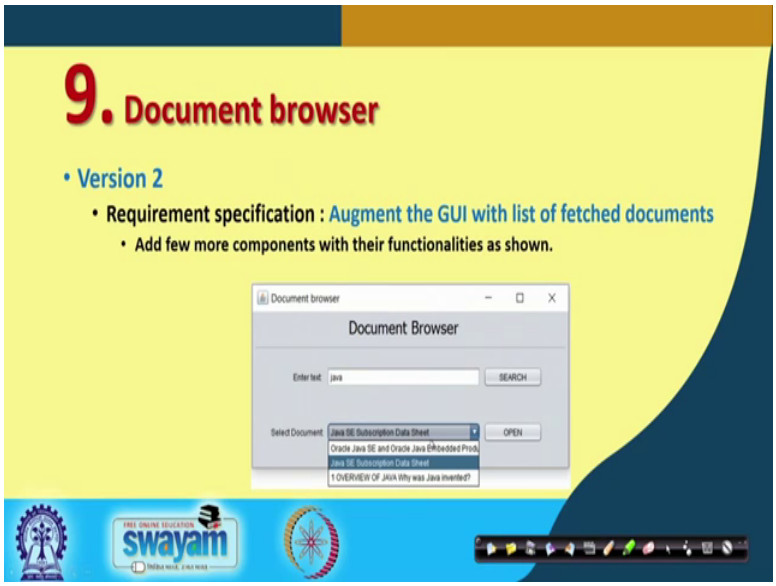
Again, you have to just communicate this search keyword to the search engine; search engine take it, search engine will fetch the document for you, return all the pages containing snippets and links and everything, then your program will right browse the links and then connect the network corresponding to the given link and fetch the document. Here is a networking issues will be there. So, you have to process all the things and then and then network communication needs to be done so that it can be a retrieve the files and everything.

Anyway, so, this is the first level interface that you have to develop. Here little bit heavy code is involved whenever user enter search keyword. It is a little bit time consuming job and little bit innovations are also there because it is not so easy going task actually, but if you try and then if you little bit experienced user then it is very simple things. And, this

kind of a experience if you gather, if you learn it, it is really useful in any future development of this kind of software development.

Now, so, here is an example. So, once the user click the search engine it will basically contact to the search engine and then it basically return the link, as you see the different links those are continuing PDF file and all the PDF file will be fetched to the documents as a next in turn.

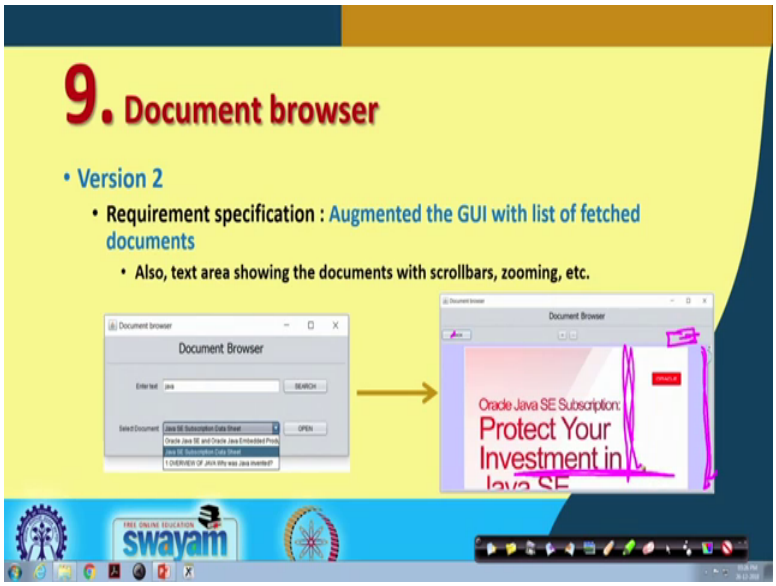
(Refer Slide Time: 17:55)



Now, here you see our next version of the interface that you have to add the fetch document and they list box will be there. As we see here basically; so, this is basically list box will contains all the documents that have been fetched based on these keyword in the system. So, it will tooled there. Then user can navigate this list and then scroll it then clicking this all the list will be a formed and then select one list of his own interest.

One particular document is selected then the open button will be there if it is clicked, the document will be opened. And then for the opening these document another interface should be there; that means, you have to develop another one user program which will basically open the document. You should not use any adobe PDF or some PDF, Browser like this; you have to develop the browser document of your own so that it will basically browser windows are there.

(Refer Slide Time: 19:02)

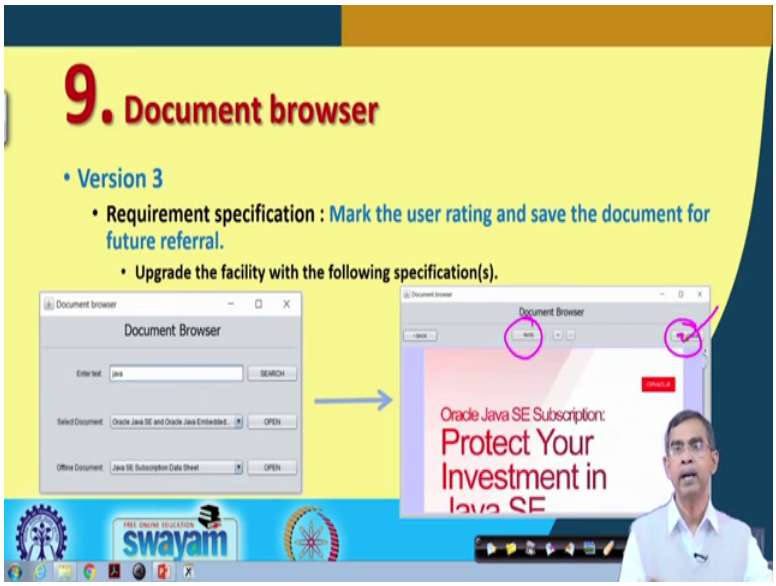


Now, the browser window typically it will look like this, here is suppose this is the interface and then browser window and here is the look of the browser window. So, this is another GUI that you have to develop once the user selects the open button it will appear. And in this browser you have to added some facilities like say plus and minus as you see.

So, if you click the plus, the document will be zoomed little bit higher resolution and is a minus it will be a lower. So, depending on the user's choice and requirement so, the document will be either zoomed in or zoomed out like. And, then there is also back button should be there, back button will scroll from the next previous page and the next button also we can apply here also, so that it in go to the next page. So, it is page up, page down sort of things are there.

In addition to this, there is a scrollbar should be there if the document is too big in size, so scrollbar needs to be followed there. So, using the scrollbar user can scroll the document up and down also from this side to that side also. So, both vertical scroll bar and horizontal scrollbar can be included in this what is called the document reader actually you can say.

(Refer Slide Time: 20:27)



So, this is the idea and in addition to this also we can add few more facilities like rating and as I told you rating and then saving the document for future referral. So, that can be carried out as a next phase of your project as a third version. As you see here so, in addition to this all these things are we have already discussed about it. Now, I just in the document reader only I want to add few more things as you see here. So, at a one button like rate; that means, if you read this document then you can read this document from 0 to 10 Likert scale both inclusive and then save offline.

Here is the another button; that means, if you like this document and if you want to save this document then it will basically give this. When you click this it will find the save location and then name of the file that you want to save it, you can do it and then save button can be clicked and then it will save the document in your own machine. So, this document whenever it is saved; it will saved with it is rating values also. So, the two things are to be maintained so; accordingly the saving pattern should be created.

So, it is not the simple saving as the windows operating system or other saving, other ways does for you. So, you have to do little bit how the two things can be maintained. It is not a very big job you can maintain one simple lock file and in the lock file you can include all these information live.

So, this is basically the idea about document browser and I hope you have understood it. In case of some difficulties to understand you are feel free to approach to me, to my team

also, they are constantly will be available for your support. So, this is the idea about two projects and we will discuss few more projects in the next session.

Thank you for your attention.