AS919611- Develop a prototype considering fitness for purpose in the broadest sense

# Brief

Recommender systems are most commonly recognised as playlist generators for video and music services like Netflix, YouTube and Spotify, product recommenders for services such as Amazon, or content recommenders for social media platforms such as Facebook and Twitter.

“In October, 2006 Netflix released a dataset containing 100 million anonymous movie ratings and challenged the data mining, machine learning and computer science communities to develop systems that could beat the accuracy of its recommendation system, Cinematch (Bennett & Lanning, 2007).

Given a dataset of movies, users and their ratings, you are to create a recommender system.

You must:

* Be able to add a user
* Search for a movie
* Rate a movie
* Recommend a movie specific to the user based on their rating
* Have a GUI
* Use persistent storage (i.e. store the data in a file)

# Materials, Tools and techniques

## Materials in the context of programming are programming languages. The languages that I will consider are: Python, Scratch, JavaScript and HTML5/CSS & database. In the table below I have evaluated the positives and negatives of each language for this prototype.

|  |  |  |
| --- | --- | --- |
| Language | Positives | Negatives |
| Python (Picked) | I know how to program everything I need in it.  Lots of online resources like Stack Overflow that I can use if I need help.  Everyone else in this class and the other DTC class knows it so it is easy to get specific help for things that websites doesn’t have an answer to.  It is installed on school computers. | Although I know how to program a GUI in it, it is hard to do.  Hard to transfer to other platforms (e.g. android, apple, smart TV). |
| Scratch | Easy to learn how to use.  GUIs are incredibly easy to write in it. | I would have to learn how to use it to a more advanced level than I currently do.  Hard to write complicated programs in because it does not have functions. |
| Java | Could transfer the program to different platforms (e.g. android, apple, smart TV).  Its GUI design would work well for this project, making it easier for me to learn and use it. | I have no idea how to program in Java so I would have to learn fast to be able to complete the prototype in time. |
| HTML5/CSS | I could easily use a MySQL database to store the movies and reviews easily.  I know how to create a nice GUI with CSS.  Since it would be a website, it could be accessed from anywhere and on a multitude of devices and platforms. | I haven’t programmed in HTML5 or CSS in a while so I would have to refresh my memory.  I haven’t programmed something close to this complicated in HTML5 so I would have to learn how.  I would have to manage the database as well as the website. |

Justification: I picked Python as the programming language I will be using for my prototype because it is the program I know the best, and I don’t have the time to learn java or learn how to do everything I need to learn to do in html5/css.

## Tools in the context of programming are the programs I will use. The IDEs I will consider using are: IDLE, Sublime and notepad++. The other programs I will use are: Microsoft Word (Documentation), Google Chrome (Help with the program), and OneDrive. In the table below I have evaluated the positives and negatives of each IDE for this prototype.

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| --- | --- | --- |
| IDE | Positives | Negatives |
| IDLE (Picked) | I am very familiar with it.  It is already installed on school computers.  It is the default IDE that comes with Python which is convenient because it automatically opens when I open python | No way to see what line number something is on unless you click on that line. |
| Sublime | It is already installed on school computers.  There are line numbers on the left which make it easy to navigate and locate errors | Annoying to use on the school computers since it’s not the default IDE. |
| Notepad++ | It is already installed on school computers.  There are line numbers on the left which make it easy to navigate and locate errors | I am not familiar with notepad++  Annoying to use on the school computers since it’s not the default IDE. |

Justification: I picked IDLE as my IDE since I am familiar with it and there isn’t much point to use an IDE that I am not familiar with.

## Techniques in the context of programming prototyping methods. The methods that I will be using are: Wizard of Oz, Storyboarding, Kanban and a Burndown chart. In the table below I have evaluated the different methods.

|  |  |
| --- | --- |
| Technique | Evaluation |
| Wizard of Oz | Wizard of Oz prototyping is a prototyping method where the developer makes a rudimentary emulation of the final outcome, often using everyday objects (pen and paper). The user may or may not be aware that they are using a Wizard of Oz prototype and not the real thing, depending on the functionality of the prototype.  Wizard of Oz is used to give the developer a sense for how users will interact with their final outcome, which gives them a chance to change core aspects before even starting the program.  H:\13DTC\AS91611\wizard_of_oz_prototyping.jpgWizard of Oz would be a good method to use for my program since it will help me find how users navigate around my program, and therefore help me construct a quality GUI that feels smooth and good to use. |
| Storyboarding | Storyboarding prototyping is similar to Wizard of Oz prototyping in the way that the developer makes a rudimentary emulation of the program, which the stakeholders/users interact with. However, unlike in Wizard of Oz, the developer manually changes the emulation, as it is not interactive.  A common method used in Storyboarding is to use a program similar  H:\13DTC\AS91611\storyboard.jpg |
| Kanban | Kanban is the software development method of using a Kanban board, which is made of sticky notes on a whiteboard (or a digital alternative) to help keep track of different tasks in an agile development process. Kanban boards help visualise work and to make it easier for a team to work together on a project since it lets everyone know what stage everything is at. In a normal Kanban board, there are three stages: To-do, doing and done. Sometimes there are extra stages such as emergency or testing, depending on what the project is. Once one task has been completed (done), another task is chosen from the backlog (to-do) to be worked on. The tasks from the backlog are chosen in order of highest importance, so that the most important tasks get done first. This is a big advantage of Kanban since even if the project gets shut down for whatever reason, there is still something to show for it.  Kanban is focused on improving workflow by visualising work and by limiting the number of tasks being worked on at once.  Image result for kanban board |
| Extreme Programming | Extreme Programming (XP) is a software development method based on reducing the cost of requirement changes by quickly doing many software cycles. This creates many “releases”, which makes it very easy for the client to change their requirements mid-way through the project. XP also utilises pair programming, extensive code reviewing and unit testing.  Extreme Programming has four activities that happen during development: Listening, Coding, Testing and Designing. You need to listen and fully understand what the customer wants before you can begin doing anything else. Coding is the next activity that usually happens, sometimes some designing is required before coding is started if the program is too complicated. Testing is the last step; it is needed to make sure everything works. Testing is done for every piece of code before it is added to the main program  Extreme Programming recognizes five values: simplicity, courage, feedback, communication and respect. Respect was added as a value in a later version of “*Extreme Programming Explaining*”.  Simplicity is used in extreme programming so that basic releases can be pumped out quickly and more functionality can be added later. Simplicity also improves the communication.  Courage is needed to support the simplicity aspect of XP, since it encourages a “Designing and coding for the needs of today instead of those of tomorrow, next week, or next month” approach. Often you need courage to trust yourself to be able to be able to program the additional features later. Courage is also needed to throw away useless code as there are many instances where a feature is added that makes the original code obsolete.  Feedback is used to help with simplicity and communication through writing unit tests. Feedback also helps the customer know the estimation for when their desired feature will be completed.  Respect in XP is for both other team members and yourself, as the quality of work should be high. Respect is also needed to make sure nobody feels unneeded or disliked, as that effects work quality  Communication is required in XP since you need to be able to easily and quickly develop iterations, while trying to limit the amount of debugging that must be done. |

Justification: I will be using storyboarding prototyping because I think the program is too simple for the other prototyping methods to be worth using.

# Initial Stakeholder Feedback

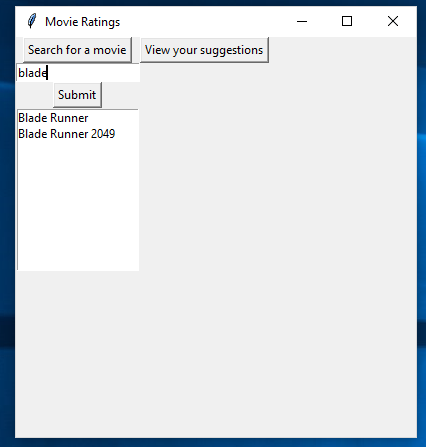
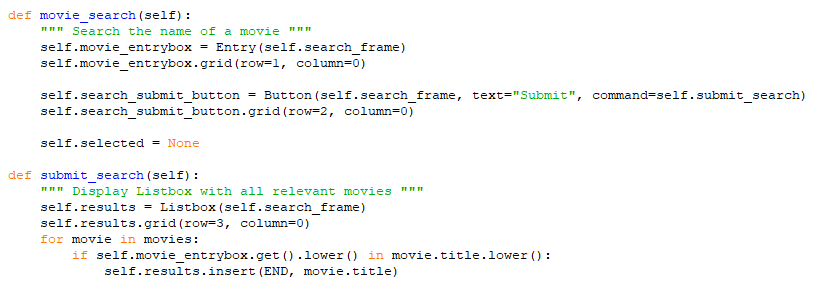
## Storyboard Prototype Initial Feedback

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| --- | --- |
| Person | Feedback |
| Ben Koepele | I like how it works, solid idea. I particularly like how it tells you the percentages. |
| Tavish Dempster | Good initial program and GUI, I like the look of it. |
| Ronan Comeskey | I like how it is all on one screen so the user can see all GUI elements at the same time. I would like to see some information labels that tells the user what movie is selected and what rating they just made to make it clearer. |
| Mr. Ny | This is good for an initial state, however you should develop on it more in later iterations. |

## Are there any other important features I should add to my program?

|  |  |
| --- | --- |
| Person | Feedback |
| Ben Koepele | I think having a ‘generate recommendations’ buttons would be good. It’s good to keep it simple though because you shouldn’t have too many crazy things happening. |
| Tavish Dempster | I think that you should be able to choose when you get the recommendations rather than it being an automatic process. Also maybe clear the entry box once the user has rated the movie. Otherwise they will have to manually delete the things that are in the box which makes the process less streamlined. |
| Ronan Comeskey | See above |
| Mr. Ny | How it is now is fine. |

# First Iteration

For my first iteration, I have created a GUI that lets the user search for a movie, then returns relevant movies. It uses a listbox to display the searched movies.

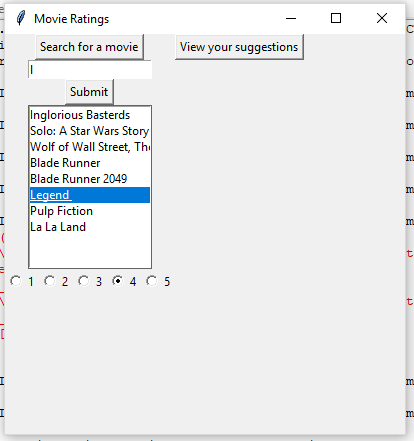
Although it doesn’t do anything, I created a button called “View your suggestions” that shows the user their recommended movies. I did this because multiple stakeholders requested it not be automatic.

In the next iteration, I will let the user rate selected movies. In future iterations I will make the suggestions button actually work, add labels and clean up the look of the GUI.

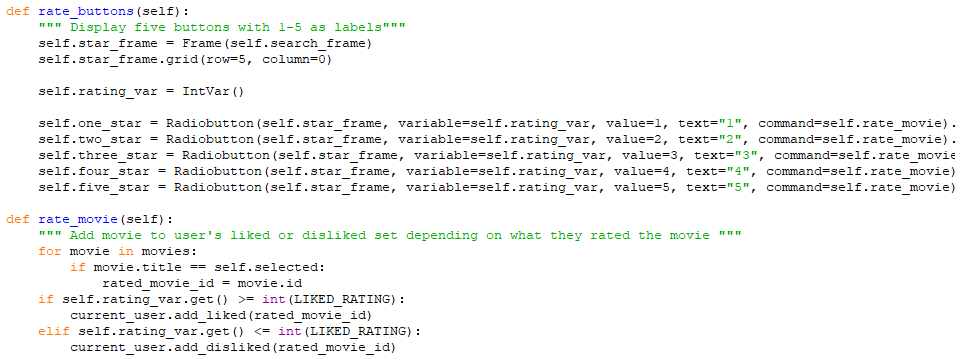
## Do you like how my search function works? What should I change/work on next?

|  |  |
| --- | --- |
| Person | Feedback |
| Ben Koepele | I like how you can search anything and it will come up with all the movies that contain what you searched, like if you search “s” it will come up with every movie containing an s in the title. I also like how you used a listbox. |
| Tavish Dempster | It’s good, clean. I think you should add a label to let you know what you have selected once you select a movie. |
| Ronan Comeskey | I like how it works but I think you need to add labels to let the user know what is going on. |
| Mr. Ny |  |

# Second Iteration

For this second iteration, I added a rate method, which allows the user to rate the selected movie 1-5 using radio buttons. I used a method that I [found online](https://stackoverflow.com/questions/15672552/python-tkinter-listbox-get-active-method), which finds which item in the listbox the user has selected.

During the proccess of coding the rating buttons, I received stakeholder feedback from T. Dempster and R. Comesky to use radiobuttons instead of regular buttons.

In the next iteration, I will add some labels to let the user know what is happening, as per my stakeholder feedback.

## Do you think my rate function works well? What should I change/work on next?

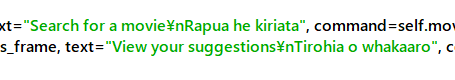
|  |  |
| --- | --- |
| Person | Feedback |
| Ben Koepele | What Tavish said, but also you should explore adding a bilingual option to your program to make sure you are not marginalising the Maori people. |
| Tavish Dempster | You should have a submit button for when you rate so if people miss click, it’s all good. |
| Ronan Comeskey | I think you should add a label or something to let you know what movie you have selected and are currently rating. You should also add a submit button for when you are rating because it isn’t clear if your rating has gone through. I also like how the radiobuttons reset when you click on a new movie. |
| Mr. Ny |  |

# Third Iteration

For this iteration, I simply added more labels to tell the user what they are doing and to add more feedback to prevent confusion.

I also added a secondary label for all text (except the movie names) in Maori, to make sure I am being inclusive. This was requested by a stakeholder.

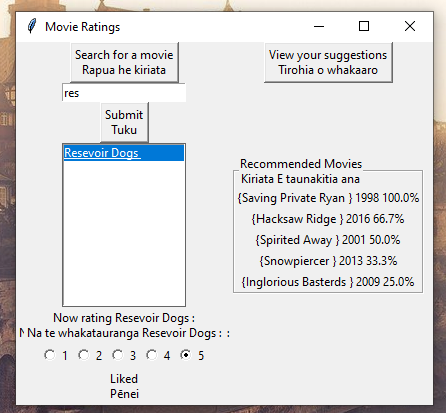
In my next iterarion I will create movie suggesstion methods so that the ‘View your Suggestions/ Tirohia o whakaaro’ button acually works.

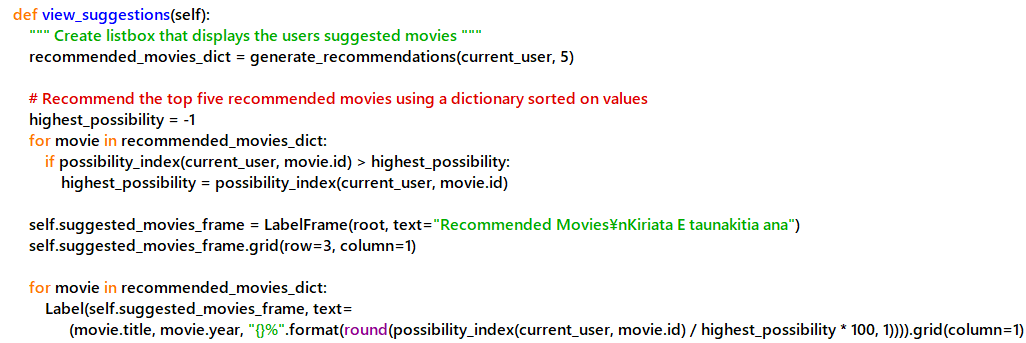


## Are my labels and buttons clear? What should I change/work on next?

|  |  |
| --- | --- |
| Person | Feedback |
| Ben Koepele | This makes it much clearer what movie I have selected and what I have rated the movie. I really like how you have incorporated the Maori language into the program. |
| Tavish Dempster | The program is much nicer to use now because I can easily tell what my current action is. I like how when you rate a movie, it tells you whether you have liked or disliked it. This eliminates the need for a submit button and makes the program more streamlined. |
| Ronan Comeskey | I like how it is obvious what the user is doing because of the labels and that it tells you whether you liked or disliked the movie after you have rated it. I also really like the Maori translations; you are making sure that your program is bicultural just like New Zealand. |
| Mr. Ny |  |

# Fourth Iteration

In this iteration I made the reccommended movies button work. It displays the user’s top five most reccommended movies, sorted using the possibility index. It also displays the possibility index in a fraction, in terms of the highest rated movie(s).



## Are the suggestions movies you would watch? Is there anything I should change in the suggestions area?

|  |  |
| --- | --- |
| Person | Feedback |
| Ben Koepele | Yes, the recommended movies are movies I would consider watching. I think the suggestions are fine how they are and other than a visual change to make the program look nicer, there is nothing that needs to be done to improve it. |
| Tavish Dempster | The movies aren’t ones that I would watch, but I think that that is because there aren’t many movies in the data sets and the ones you have are mostly ones that I have already watched. In the future, you should use a larger data set. I like how the program gives you the possibility index as a percentage, it makes it much more readable. |
| Ronan Comeskey | The recommendations are good, but I think that you need more movies in your data set to make the results more reliable for different types of users. For example, there are no children’s, superhero or horror movies. However, I like the use of percentages for the possibility index instead of decimals. |
| Mr. Ny |  |

What should I work on in a future iteration of my program?

|  |  |
| --- | --- |
| Person | Feedback |
| Ben Koepele | In the future, you should consider redoing some of the layout of the program to make it more aesthetically pleasing. You should also consider changing from a like/dislike system to a proper 5-star system, where each star has a different weight. |
| Tavish Dempster |  |
| Ronan Comeskey |  |
| Mr. Ny |  |

# Evaluation

yup