**Duke University Java Programming Course Journal**

Throughout the 5 courses of Java that I took from Duke University on Coursera, I have learnt an exuberant number of things about Java and have grown to become confident in making different programs, methods, and classes in Java. During my first course, the professors at Duke University taught me how to make attractive websites using HTML, CSS, and JavaScript. We created websites on Codepen which helps novices make websites by providing a powerful editor. This was the first time I started making things using code so it was a bit challenging at first, however when I got the hang of how programming languages work, the struggle gradually metamorphosed into enjoyment. In this course, we learned the basics of how websites are designed as well as the how algorithms are devised to solve one or multiple problems. These objectives were fulfilled by creating a website that implemented the green screen algorithm along with several other filters that manipulates a picture’s pixel according to need. In addition to all this I did an honors week which taught by steganography which is hiding the information in pictures so that only a code written to decode a picture would be able to retrieve the message. This was a fun experience as I got to learn about how messages are hidden in the real world!

In the second course, we were introduced to Java and its object-oriented concepts. The main purpose of this course was to clear the basic Java concepts, so that the user would be able to solve the problem with software. We then learned how to process data files like a CSV file and use it in our programs. One of the main projects that we made during this course was the Baby Names program. In this project, we wrote methods that would tell your name in a particular year based on your gender as well as your Name Rank. Regardless of the constant problems I had during the development of this project, it was really fun as I got to experiment with the different ways you creatively use data to show something exciting which may have taken a longer if done by hand.

In the third course, I looked at how data is stored in Arrays, Lists, and other different Structures and when to use it. To meet this goal this course was mostly based on cryptography which taught us how encrypt and decrypt information and how hackers exploit week encryptions to retrieve information in a system. First, we looked at the Caesar Cipher which was the first type encryption used by humans and was considered easy to decrypt. And then we looked at the Vigenère Cipher which is a much more advanced type of encryption and was considered unbreakable by many people around the world. We also looked at how Web Server Logs are stored and then how the data is queried through Java. And finally, we made a very fun random story generator program which created a random story based from a template. This project was one of my personal favorite projects as I loved the funny stories the program created each time I ran it.

In the fourth course, we started looking at the principles of software design. The two-main principle we looked at were Efficiency, and the Open for extension and closed for modification principle. We tested this code by make programs which can sort earthquake data based on the given parameter, and by creating a N-Gram predictive text which used the MarkOv Models to predict the next few letters or words after one. These same approaches are used by google and other Tech Giants to predict the next few words before we complete a sentence. To make these programs more efficient we used Hash Maps to store data which can decrease speed immensely. And for making the program as flexible as possible we used multiple different Filters and Abstract classes, so that the code is not replicated and thus minimal modification is required to extend the program. In the Final week of this course we looked at other Java Tools and Libraries and how to create Java programs outside of novice friendly editors such as BlueJ, and move to more professional editors such as eclipse. In this week, I learned how to make the code as efficient and flexible as possible we need to create increasingly connections between the different objects of Java. This proved hard to me but as I completed the course I became more confident with my Java skills.

For this final course, we were supposed to create a recommended movie system based on the viewer’s movie preference and ratings. The main goal of this course was to create a system that combined all the skills that I had learned over the past 4 courses, thus this whole course was based on a DYI project. For this system, I first started off my giving a recommended list of average ratings, or by genre or director, etc. Until here my code was work fine as I was getting the desired output. After this we moved on to giving the recommended list based on weighted average, meaning that the movie in which the movie rater’s ratings are most like the viewer would be displayed first. This was the most difficult part to achieve for me as it required you to do a lot of Math and to have a very clear understanding of all the components of the Java program. I was stuck on the problem for several days until I asked one of Java professionals about what I am doing wrong and they helped me fix serval mistakes in my code. When I finished the code that one of my major flaws was that I would always solve a simple problem in a very complex way and that is the reason I struggled for this problem. Anyway, not that I am done with all courses, if I reflect, I realize just how much I have learnt. I have gone from making a simple website to making an entire system. Though challenging, this project has been one of the interactive, creative, and amusing projects of my life. For that I would like to thank all the professors at Duke University for giving me a chance to improve my Java skills to such extent.