**JRAT**

Within this project JRAT analysed the code by inserting two lines of code.

java **-javaagent:shiftone-jrat.jar** [your java ops] [main class]

The first line is inserted, is a single java command that is placed in the code to launch the program. Now the user should run the code as much as possible and iterate as much of the functions coded as possible, so that JRAT give as much potential feedback and analysis as possible. After this exit/turn off the program and JRAT should produce a few files.

java -Xmx256M -jar shiftone-jrat.jar

These files are saved but are not human readable and to have to be viewed in the JRAT desktop app. These jar files are saved in the same container as the JRAT desktop app, as this is needed to open and analyse those files. Navigate to a subfolder called JRAT output and file->open one of the JRAT files.

**SCRUM**

This process occurred twice to three times a week for the team. Meetings often on Monday, Wednesday and Thursday. The scrum was used to evaluate the work used within that week by asking 3 simple questions, what did a team member do? What problems they encountered? And what was that member going to do next?

These meetings were essential in developing the product, as it helped the group to work as unit, become integrated in each other’s work and planning the scope of the project in all areas from database, java backend and the Angular front-end making the new approaches and technologies easier to use.

**CONCLUSION**

Within this module I learned and developed a lot of new and key skills, that in my own believe aided my own personal growth, new and useful technologies that are used widely in industry and how collectively work within a team and simulate a real world software development task.

Within the product development a list of new and interesting technologies where used, I helped develop the front-end development of the project and was tasked with adopting a new and fun approach, ANGULAR. Angular is a framework that helps implement a dynamic web apps. I had used HTML and CSS previously and had a high proficiency in both but I wanted to help develop my range of skills further and adopted angular framework into the project, by doing this I used bootstrap, typescript, HTML and CSS, these all give the front-end a much more detailed and in-depth appearance, and also a much more appealing visualisation to the product user. Typescript and bootstrap were new concepts to learn but I believe although a learning curve was necessary, they were much easier to develop in comparison to a website solely coded in HTML and CSS. The frontend was connected to a java backend which referenced the classes and then communicated with the MONGODB. These 3 software types implemented smoothly together. Mongo dB was a new concept in addition to bootstrap and typescript. Mongo dB is a NOSQL language and has a lot of added benefits over the MySQL skills I had before, two of the most obvious being its faster at reading operations and more dynamic in development.

In addition to the technologies used within the team project a lot of team collaboration skills and real-world industry experience was gained.

The team adopted the AGILE approach for the project over the traditional waterfall method. This approach aided in software development, reduced paperwork, and communicates with the product owner more efficiently adapting and making changes throughout with the software development aspect a priority.

Adaptive processes where iterated throughout the production, the team members communicated with each other very regularly and with the product owner to achieve the best possible results.

Engagement with the product owner was a necessity for a more accurate representation of their desired product. Meetings would happen weekly and on two separate occasions the product owner came and evaluated progress in production and implementation of the website.

The concept of Scrum was new to all of us and at first it was a difficult to work it correctly into the product, which showed in our production at that early stage. After a few weeks and between 2-3 scrums a week it became an easy and fluent process.

In addition to this the use of Jira helped in planning and detailing tasks for each individual team member. Each team member could see each other’s tasks for that time, issue tasks and complete tasks. This constructive method of planning aided in the software development cycle.

Another thing I liked about this subject was the use of new tools within the product development for example Jira already mentioned but JRAT, Jacoco, GIT and Junit.

These tools helped make the software as efficient as possible without the guidance of lecture and helped give an experience of tools used in industry for a software process like this.

Overall I enjoyed my experience simulating an industry process and feel I gained a lot of useful knowledge for my own personal development moving forward. Although I do believe time was a major factor in development I was happy with experience and knowledge gained.