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| **IMAT3904 Report Template**  Please write in the boxes below. Expand the boxes as you need to, however this report should not exceed 2 pages. | | | |
| Name: | George Hanks | P Number: | P17173176 |
| Github Username: | geohan98 | Github Repo URI: | <https://github.com/IMAT3904/cw-geohan98> |
| **Please summarise the functionality of your game engine (bullet points are fine):** | | | |
| * Console Logging * Time Keeping * Event Handling * Window System * Input Polling * GPU Buffer Abstraction * Texture Abstraction * Shader Abstraction * Basic 3D Rendering * Basic 2D Rendering / Basic Text Rendering * 3D Camera * 2D Camera * Layers * Composable Game Objects * Components * Model Loading * JSON Level Loading | | | |
| **What testing have you performed and what testing strategy was used?** | | | |
| **Black Box Testing** – Throughout the project I would perform very loose black box testing to verify that new functionality was working as intended, however as there was no detailed specification for much of the functionality it was difficult to design test cases, so most of the time these were not recorded. Examples of black box testing would be when abstraction of the buffers and OpenGL objects occurred, they should output the same result after the abstraction.  **Unit Testing –** I have written unit tests for some parts of the project, they can be used to verify parts of the code work as intended very quickly. However, I did not find them very useful when debugging, as it was usually very apparent when something was wrong and where the program was going wrong.  **Profiling –** I did limited profiling to see the difference from the debug version of the project and the release version. I would the compare the differences between the frame rates of the two versions. | | | |
| **How have you approached your time management for this piece of work?** | | | |
| Time management has always been difficult for me, especially when there is a large amount of work to do, for this project I would try and fit the work in by doing small amounts every day, rather than long session on a couple days a week. This worked around my other university work and personal commitments. However, I still struggled to keep up with the weekly work, so towards the end of the project I did have to put in extra hours in order to complete sections of the project. | | | |
| **What have your learned from whilst building your game engine?** | | | |
| **Engine Architecture** – Before this project I had limited knowledge on how game engines where designed and how all the systems interacted with each other. I now have a better knowledge on how a game engine can be built, but I feel I still have much to learn with respect to common practices in software engineering.  **OpenGL** – I have leant a great deal about building an OpenGL render in this project, I feel that I could independently build a basic rendering system for another project with the knowledge I have gained. I would like to lean more advanced techniques with OpenGL such as batch rendering and deferred rending.  **Premake** – I had never used a build system before this project, so when I leant about premake it really changed how I could work, it was now easier to switch between workstations and continue my work, without the need to upgrade solutions or projects in visual studio, I now try to use a build system for any new projects I have on GitHub. | | | |
| **If you were to undertake this piece of work again what would you do differently?** | | | |
| **Time Management** – My time management for this project could have been better, if I had paced myself better, I think I would have been able to complete more work to a higher standard. I wasted timer early on which impacted the back half of the project.  **Asking Questions** – Whilst I now know how to build a simple game engine, I do not know why we have done things in this way, or why doing this way is better than other solutions. I think I should have asked my tutor more questions about the structure of the game engine, and why we are choosing to do things that way.  **GitHub Commits –** I made frequent use of github during the project however it wasn’t very consistent, some weeks I would not commit at or and other I would commit multiple times. I also think I should have put more effort into the commit messages, as I was working on my own this did not affect me, but if I was in a group this could cause confusion amungst my co-workers. | | | |