Programming for Computer Games

Task 1: Game Engines

Research 5 Game Engines. In point form, and in your own words, for each engine list:

- The programming Language(s) used in it
- A game programmed using that Engine
- Whether it is a 2D/3D (or both) Engine

Unity:

- In Unity, while you **can install other languages/ plug-ins it uses C#**.
- A game programmed using Unity is **Ori and the Will of the Wisps**.
- Unity is a 3D engine, but it is possible placing 2D sprites.

Godot:

- In Godot, there are **multiple languages** including **C++ and C#**.
- A game programmed using Godot is **Fluffy Horde**.
- Godot is both a 2D and 3D engine.

GameMaker:

- GameMaker uses a built-in programming language called **GML** or **Game maker Language**.
- A game programmed using GameMaker is **Flappy Birds**.
- GameMaker is both a 2D and 3D game engine.

Solar2D:

- Solar2D uses **integrated Lua with C++ and OpenGL** on top.
- A game programmed using Solar2D is **Designer City**.
- As the name suggests Solar2D is a 2D game engine.

Frostbite:

- Frostbite uses **C++ and C#** for programming languages.
- A game programmed using Frostbite is **Need for Speed Heat.**
- Frostbite is a 3D game engine.

Task 2: File types for media assets

a. Choose 3 types of image formats from SVG, JPG, PNG, WEBP, GIF, BMP and explain each image format, in your own words.

PNG:

PNG supports up to 48-bit images and it is also lossless which means that it will not degrade quality over time, the image will be a true replication with decreased file size.

GIF:

GIF also known as Graphics Interchange Format can be used for small animations and low-resolution film clips. A GIF image is only limited to 256 colors. GIFs are mostly used for games and web design.

JPG:

JPG file format is saved using the method of lossy compression, as a result of the compression, there would be a trade-off between storage sizes and image qualities so if someone adjusts the compression level to achieve the desired storage size they would be sacrificing the image quality and vice-versa.

b. Choose 2 types of audio formats from OGG, MP3, WAV AAC, WMA and explain each format, in your own words.

MP3:

MP3 compresses audio while trying to retain the audio quality comparable to CD. It also uses lossy data compression. It is possible to create sound files ranging from 32 to 32kbps (kilobits per second) with MP3.

WAV:

WAV is a lossless audio format that does not compress the original analog audio film. WAV is mostly used by digital music companies.

Task 3: Compression in multimedia

a. The importance of compression in images

Image compression is basically minimizing the size in bytes of a graphic file while also trying to keep the image quality as high as possible. This also leaves space for more images to be stored in the hard drive. Not only that but compression will reduce the time required to move a file from one to another therefore being extremely efficient and helpful while also being cheaper in the long run thanks to the size reduction. This is why image compression is very important in everyone's lives especially to those who need to move a lot of files in a short period of time.

b. Explain in detail using diagrams how compression in audio file works.