Course Title	**Advanced Diploma**		**Lecturer Name & Surname**	**NEIL AQUILINA**	
Unit Number & Title	**Programming for Computer Games**				
Assignment Number, Title / Type	**Research and Design – Home (24 Hours)**				
Date Set	18/12/2020	**Deadline Date**	**19/12/2020**		
Student Name	Josue` Camilleri	**ID Number**	116303L	**Class / Group**	4.2B

[x]	*Student's declaration prior to handing-in of assignment:* ❖ *I certify that the work submitted for this assignment is my own and that I have read and understood the respective Plagiarism Policy*
[ ] [x]	***Student's declaration on assessment special arrangements (Tick only if applicable)*** ❖ *I certify that adequate support was given to me during the assignment through the Institute and/or the Inclusive Education Unit.* ❖ *I declare that I refused the special support offered by the Institute.*
Student Signature:	**Date :** 18/12/2020

Assessment Criteria	Maximum Mark	Mark Achieved
KU1: Identify and describe different game engines for different tasks	5	
KU3: Describe file types for media assets	5	
KU4: State the relevance of compression settings in media assets	5	
SE1: Design and specify the details of the game to be developed, including a state machine	10	
Total Mark	25	

Assessor's feedback to student
(If necessary, use reverse side of page for IV feedback on assignment brief / sample of assessment decisions)

Home Assignment 1: Research and Design

Task 1: Game Engines

Unity:

- The programming language used in Unity is called C# and C++.
- A game programmed using Unity is “Temple Run”.
- Unity is both 2D and 3D.

Unreal Engine:

- The programming language used in Unreal Engine is called C++.
- A game programmed using Unreal Engine is “Spider-Man PS4”.
- Unreal Engine is both 2D and 3D.

Frostbite:

- The programming languages used in Frostbite are called C++ and C#.
- A game programmed using Frostbite is “FIFA 20”.
- Frostbite is both 2D and 3D.

IW Engine:

- The programming language used in IW Engine is called C++.
- A game programmed using IW Engine is “Call of Duty: Modern Warfare”.
- IW Engine is 3D.

PopCap Games Framework Engine:

- The programming language used in PopCap Games Framework Engine is called C++.
- A game programmed using PopCap Games Framework Engine is “Plants vs. Zombies”.
- PopCap Games Framework Engine is both 2D and 3D.

Task 2: File types for media assets

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

1. JPG
   JPG stand for Joint Photographic Group and it is a compressed image format to make the files smaller in size. It is a quite common file format for photo storage, and it is also popular as they save more storage space than others. JPG can be used with photographs since the detail in the image tends to hide compression artefacts. A drawback is that it struggles with sharp edges and curves.

2. PNG
   PNG stands for Portable Graphics Format and it is a raster-graphics file format that supports lossless data compression. PNG is good for detailed images with high contrast and can display transparent backgrounds or a semi-transparent image. It is often used to design logos since the image can be placed over a background of a picture or block of colour.

3. GIF
   GIF stands for Graphics Interchange Format. It is a lossless format that supports animated and static images, it is also a bitmap image format. They require low bandwidth and are compatible for the graphics that consume solid areas of colour.

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

1. MP3
   MP3 supports compression and is a lossy format, so it prevents good sound quality. It is supported on various computer platforms. MP3 is compressed but still has high quality sound for the use on internet and other portable MP3 players.

2. WAV

   WAV stands for Waveform Audio File Format and is an uncompressed format. It can be played by almost all Windows applications that support sound. WAV files have high quality sound and can be played on both Windows and Mac. It can also be used for digital recordings of the sounds made by any instrument or human voice. A drawback of using this type of audio file format is that it is not practical for portable devices and streaming because of its large files.

3. AAC
   AAC stands for Advanced Audio Coding and it is a lossy format. The file format is the successor to MP3. It produces better sound quality, as well as reduces its file size compared to MP3 files. Many marketable users such as Apple products, YouTube and Sony PlayStation use this standard for their digital audio.

Task 3: Compression in multimedia

The importance of compression in images (100 words)

It is important to compress images so you can save more storage space and have space for more images on your hard disk. When a file is compressed, it becomes roughly half the size of an uncompressed file, and only encodes the original image with a few bits. It does not reduce the physical size of an image, but instead compresses the data that makes up the image into a smaller size. It is also important to compress images, so that the time required for an image to be sent or downloaded via the internet will decrease. It will also reduce the redundancy of the image and store or transmit data in an efficient form.

Explain in detail using diagrams how compression in an audio file works. The diagram must be originally drawn by yourself, and not copied and pasted.

Lossless Compression:

Original Restored

Lossless audio file is compressed without losing any information or degrading the audio quality. It utilizes compression systems that allows a file to be roughly half the size of an uncompressed file. An example of a lossless compressed format is FLAC. Lossless compression is also ideal for storing audio files which the user might Require to eventually convert into other formats.

Lossy Compression:

Original Restored

Lossy compression audio file formats are the most common audio formats, as through the removal of unnecessary and redundant information, it can squeeze an audio file to about one tenth of its size, without loosing too much of its audio quality. A common lossy compressed audio file is MP3.