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	NEIL CASHA	ID Number	350203L	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*
☐ ☐	***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:	N. Casha	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)

PCG Research & Design

Task 1 - Game Engines

Unity

The Unity game engine uses the **C++** and **C#** programming languages; **Hearthstone** is a game which was made with this game engine. Unity is both a **2D** and **3D** game engine.

Frostbite

Frostbite uses **C++** and **C#** programming languages; the **Need for Speed** was created using Frostbite. The engine supports both **2D** and **3D** imaging.

DUNIA

This engine uses **C++**. **Far Cry 5** was one of the games created with **DUNIA**. This game engine only supports **3D**.

Source

This engine uses the **C++** language; **Half-life 2: Lost Coast** was made with Source. This game engine also only supports **3D.**

RE Engine

AnvilNext uses **C++** and **C#**. This engine was used to build **Tom Clancy's Rainbow Six Siege.** It also only supports **3D.**

Task 2 - File types for media assets

2A

SVG – stands for Scalable Vector Graphics; it is a vector image format which supports 2D graphics and it is an open standard developed by the World Wide Web Consortium. SVG images and their behaviours are defined in XML files.

WEBP – is a modern file format which provide both lossless and lossy compressions. It is used for images on the internet. Using this file format, webmasters and developers can create richer images which can make internet applications faster because of their small size. Images of WEBP which are lossless, are known to be 26% smaller than the PNG file format.

BMP – also known as the bitmap file format, provide raster graphics and is not dependant on a device. It can store two-dimensional digital images both monochrome and colour. This format supports Various Colour Depths, alpha channels, colour profiles, and optional data compression.

2B

WAV - Waveform Audio File Format is an audio file format standard, developed by IBM and Microsoft, for storing an audio bitstream on PCs. It is the main format used on Microsoft Windows systems for raw and typically uncompressed audio.

WMA - The WMA format is a lossy audio file — like MP3. The file format is an acronym for Windows Media Audio and was first released in 1999 by the Microsoft company for use with their Windows Media Player program in their Windows operating system. The file extension has evolved since its initial launch but has continually retained the WMA file extension.

Task 3 - Compression in multimedia

A

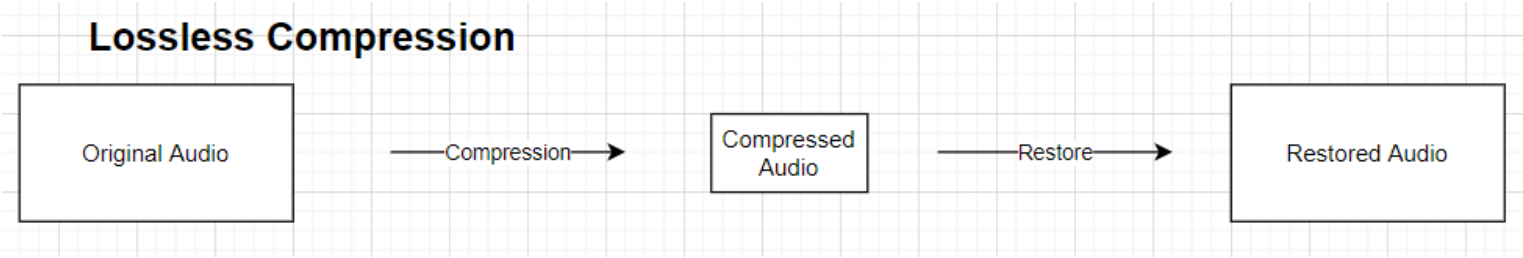
As most people know, image file compression is done to reduce the size which the image file takes from whatever location is placed. This can be done to an extent to which the quality of the image is still acceptable. This can be important depending on the location where the file is saved. If the storage location has very limited space available, this is where file compression can make a big difference. On the other hand, however, if the image files are being used for a different scenario, such as being embedded in a website or web application, file compression is much more important, because of the file size is rather large, the image may load slower than website, which depending on its structure, may appear very different than intended.

B

The goal in audio compression is to reduce the number of bits required to accurately reproduce an analogue sound. Audio file compression can be explained in 2 parts lossy compression and lossless compression.

In technical terms, the audio data, which is recorded in waveform, is reduced to differing extents for transmission respectively, which may cause in loss or no loss of data.

For **lossless compression**, the size of the digital file is reduced without affecting the sound quality. You get the same quality as the original audio, but it takes up less storage space on a storage location.



Therefore, when restored, the outcome will be the same as the original audio with no loss in quality.

For **lossy compression** however, when the audio is compressed, there is already some loss in quality in order to reduce to file size more drastically than lossless compression. Therefore, when trying to restore the audio, the outcome will not be identical to the original file, because the quality lost during compression cannot be retrieved.