MCAST Technical College

INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY

ASSESSMENT AND INTERNAL VERIFICATION FRONT SHEET (Individual Criteria)

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	Lucas Zahra	**ID Number**	**240703L**	**Class / Group**	**4.2C**

☑ *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:	Lucas Zahra	**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)

	Name & Surname	Signature	Date
Internal Verifier : Approval of *assignment brief*		For approval signature, please refer to electronic audit trail	
Lecturer / Assessor : Issue of results and feedback to student		For approval signature, please refer to electronic audit trail	
Internal Verifier : Approval of *assessment decisions (Sample)*		For approval signature, please refer to electronic audit trail	
Learner's signature upon collection of corrected assignment.			

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

Unit: IICT4016 -

Programming for Computer Games

Home Assignment 1: Research and Design (24 hours)

Assignment Submission:

On your Assignment Repository, create a folder *Research and Design* and in it upload:

a. **Task 1, 2 and 3 as a single PDF**
b. **Task 4 as a JPG or PNG**

Task 1: Game Engines (KU1) – 5 marks:

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

- Unreal Engine: 1. The programming language used in unreal engine is C++
  2. A game programmed using unreal engine is Gears of War
  3. Unreal engine is 2D and 3D

- Unity: 1. The programming languages used in Unity are C#, UnityScript and Boo
  2. A game programmed using Unity is Lara Croft Go
  3. Unity is 2D and 3D

- GameMaker: 1. The programming languages used in GameMaker are C++, Delphi and C#
  2. A game programmed using GameMaker is Spelunky
  3. GameMaker is 2D and 3D

- Godot: 1. The programming languages used in Godot are C++, C#, Rust, Nim, and D
  2. A game programmed using Godot is TailQuest:Defenece
  3. Godot is 2D and 3D

- AppGameKit: 1. The programming languages used in AppGameKit are AGK and C++
  2. A game programmed using AppGameKit is Rush to Adventure
  3. AppGameKit is 2D and 3D

Task 2: File types for media assets (KU3) – 5marks

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

1. GIF: GIF is a series of images or soundless video that will loop continuously and doesn't require anyone to press play.

2. JPG: JPEG is a commonly used method of lossy compression for digital images. The compression can be adjusted to the user's preference so the user can have a trade-off between storage size and image quality.

3. PNG: PNG is a lossless data compression format. PNG has the ability to display transparent backgrounds also PNG files are capable of containing 24bit RGB colour palettes and greyscale images.

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

1. MP3: MP3 is a compressed audio file format. A typical MP3 file sounds similar to the original recording but requires significantly less disk space.

2. WAV: A WAV file is a raw audio format. The format uses containers to store audio data, track numbers, sample rate, and bit rate. WAV files are uncompressed lossless audio and as such can take up quite a bit of space.

Task 3: Compression in multimedia (KU4) – 5 marks

Research the following in your own words:

a. The importance of compression in images (100 words)

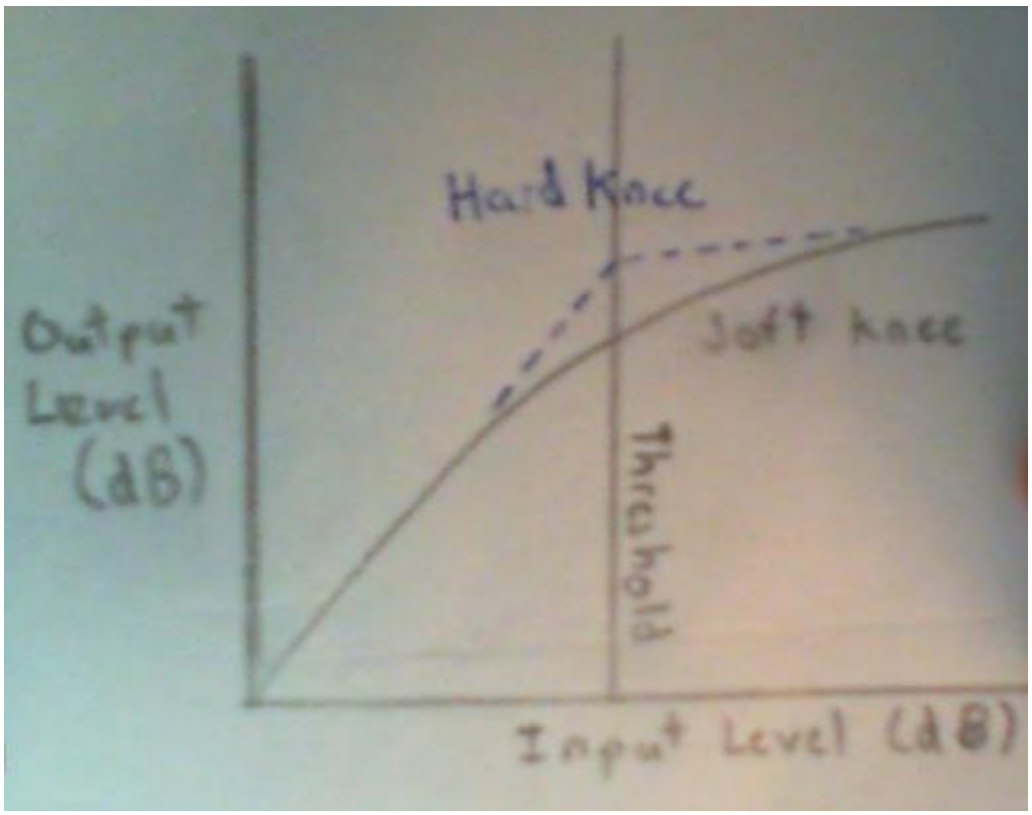
b. Explain in detail using diagrams how compression in an audio file works. The diagram must be originally drawn by yourself, and not copied and pasted.

a. Image compression reduces the image size without degrading the quality of the image to an unacceptable level by reducing the size in bytes of a graphics file. This is extremely important since it reduces the size of image so more images can be stored in a given amount of disk memory or memory space. This also help reduce the time required for images to be sent over the internet or download images from the web.

b. Most compressors use this 4 basic elements of compression Threshold, Knee, Attack Time and Release Time.

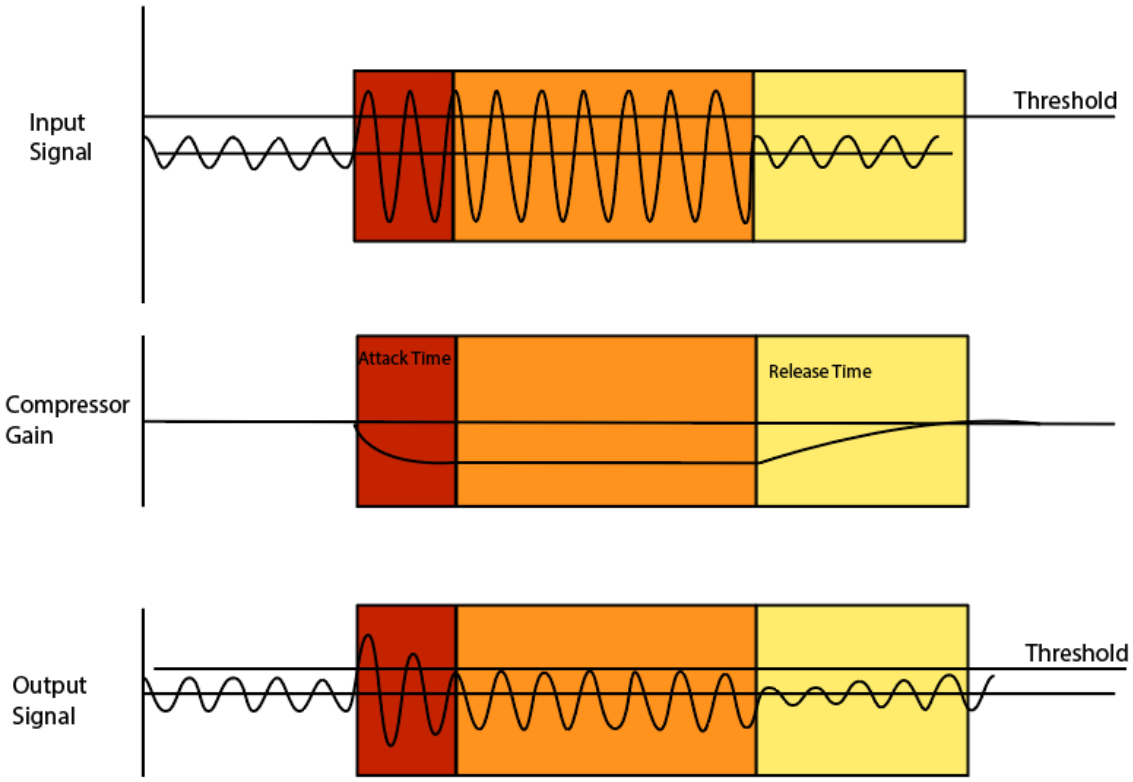
   Threshold: The threshold control sets the level at which the compression effect is used. Only when a level passes above the threshold will the audio compression. The rest of the time, no compression will be taking place.

   Knee: The “knee” refers to how the audio is compressed between the non-compressed states and compressed states of an audio signal running through it. There are two types of “knee” a “hard knee” and a “soft knee”. “Hard knee” is a sudden conversion while “soft knee” is a more gradual conversion.



Attack Time: Attack Time is the time it takes for a signal to become fully compressed after exceeding the threshold level. Faster attack time depend on the type and brand of unit. Fast attack time create distortion by modifying inherently slow-moving low frequency waveforms.

Release Time: Release Time is the opposite of attack time, it is the time it takes for a signal to go from the compressed state back to the original non-compressed state. Release Time will be longer than attack times depending on which unit the user is working with.



Made with illustrator.

Task 4 – Design using State Diagram (SE1) – 10 marks

For this task you can use *https://app.diagrams.net/* or any other drawing program you like. Save the final diagram as a JPG or PNG and upload on Github as instructed.

Scenario: MCAST Break

The following is a scenario of an Adventure Game. You are to read it carefully and create a State Diagram for it. Different states can be accessed by pressing the Capital Letter of the State in brackets. Each state will give you a description of what you can do:

You wake up in the middle of the night and find yourself in an MCAST classroom on the top floor. The only things to be found are: an old PC with some cables, a table, a broken chair and a door which is locked.

You have to escape and return home before the sun rises up.

You start in a (R)oom. You can go to any of the 4 things found in the Room:

(T)able, (C)hair, (L)ocked Door, (P)C

If you go on the (T)able, the only thing you find is dust! You can return to the (R)oom.

If you go to the (C)hair, you can see a lot of borer holes.

If you search the (P)C closely you can find a number of wires and a small thin Screwdriver. You can take the Screwdriver and go back to the (R)oom or to the (L)ocked Door.

You try your luck and go to the (L)ocked Door and try to pick the lock with the screwdriver and…. voila, the door can now be opened and you are (F)ree to go home.

Assignment Rubric:

Criteria and tasks	**Marks**
KU1: Identify and describe different game engines for different tasks	
For 5 Game Engines list:	**5**
The Programming Languages used in it	
A game programmed using each Engine	
2D/3D Engine	
KU3: Describe file types for media assets	
Explain 3 image formats	**3**
Explain 2 audio formats	**2**
KU4: State the relevance of compression settings in media assets	
Research the importance of compression in images	**2**
Explain in detail using diagrams how compression in an audio file works	**3**
SE1: Design and specify the details of the game to be developed, including a state machine	
Create a good State Diagram for the scenario	**5**
All states must be listed in the State Diagram	**2**
All triggers must be correct in the State Diagram	**3**
TOTAL MARKS:	**25**