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	Daniel Cini	**ID Number**	**0194702L**	**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:	Daniel Cini	**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
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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:

1. **Unreal Engine 4**

- In Unreal Engine 4 you can code with: C++, blueprint, Java
- Batman: Arkham City (Return to Arkham)
- Unreal Engine is both a 2D and 3D engine

2. **Unity**

- In Unity you can code with: C#, C++, JavaScript
- Phasmophobia
- Unity is a 2D, 2.5D and 3D engine

3. **Amazon Lumberyard**

- In Amazon Lumberyard you can code with: Script Canvas and Lua.
- The Grand Tour Game
- Whether it is a 2D/3D (or both) Engine

4. **CryEngine**

- In CryEngine you can code with: C++, C#
- Far Cry
- CryEngine is a 3D engine

5. **Urho3D**

- In Urho3D you can code with: C++
- Infested: a survival horror and investigation game
- Urho3D is a 3D engine

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.

- **JPG/JPEG –** JPG (Joint Photographic Group) is a raster format and it is mostly used in photographs as its file size are typically small while having a good quality.

- **PNG –** PNG (Portable Network Graphics) is a raster format and it also supports lossless data compression. It can also show a transparent background. PNG was created to replace GIFs.

- **GIF –** GIF (Graphics Interchange Format) is a raster image type. It uses a bit-mapped graphics file format. It is used by the World Wide Web for various settings.

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

- **OGG –** OGG (Ogging) is an open-Source file format which can contain music, text and metadata. It is optimised for streaming content since it is Copyright-free and free of charge to use.

- **MP3 –** MP3 (MPEG Layer-3) is a compressed audio file format. Usually an MP3 file sound similarly the original audio but it uses less disk space.

- **WAV –** WAV (Waveform Audio File Format) is an accurate and lossless format which means that it loses no audio quality from the original recording. Because of this their file size is big and can take up a lot of space.

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

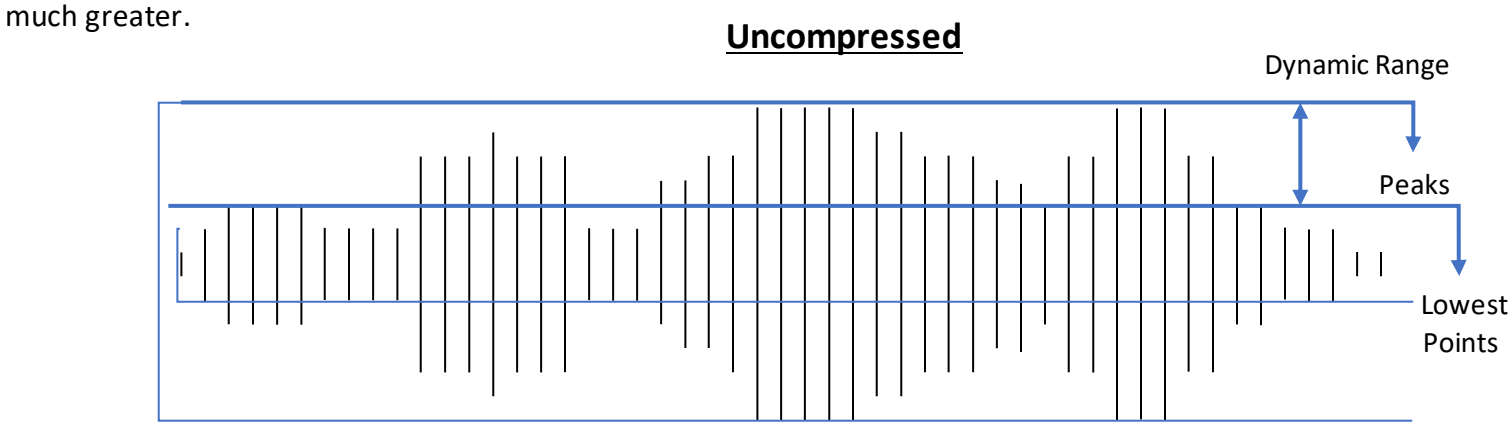
Research the following in your own words:

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

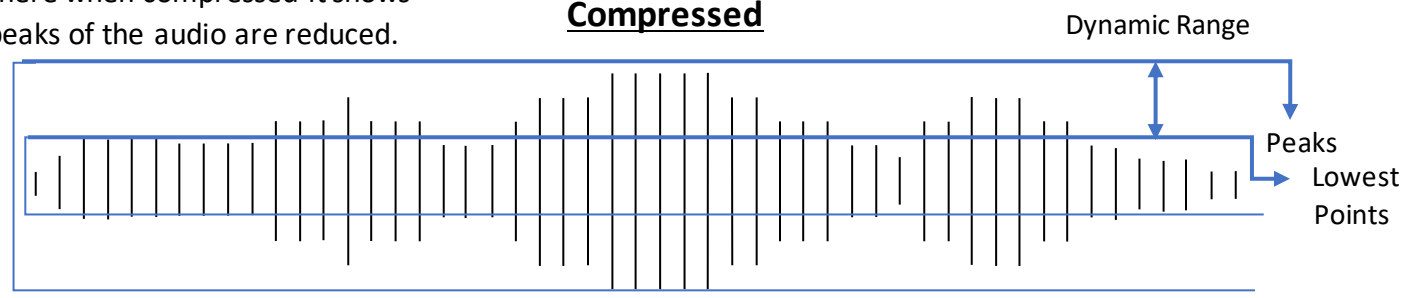
Overall, there are two types of compression methods which are lossy compression and lossless compression. If you do a lossless compression no data will be lost and it is instead preserved, while if you had to do a lossy compression the data is lost as it does not store it. However even though lossy compression loses data when compressed it still might be better to use as its file size is reduced while lossless file sizes are typically bigger and limited to reduce the size of space. Lossy compression can also be controlled to a limit so that the image quality and size is balanced.

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.

Here where the audio is not compressed the wave peak is much greater.



Similarly, here when compressed it shows how the peaks of the audio are reduced.



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**