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	Kyle Attard	**ID Number**	**0140702L**	**Class / Group**	IT-MSD-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:	Kyle Attard	**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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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

Task 1: Answer

1. Unreal engine:
    - Unreal engine uses “c++” as programming language.
    - A game programmed with unreal engine is “ Gears of War **“.**
    - This is a 2D and a 3D engine.

2. GameMaker:
    - GameMaker uses “GML (GameMaker Language)” as programming language.
    - “Spelunky” is a game programmed with GameMaker.
    - This is a 2D engine.

3. Godot:
    - Godot uses “ c++ and c# “as programming language .
    - “Dog Mendonça & Pizza Boy” is a game created by Godot.
    - Godot creates 2D and 3D games.

4. Unity:
    - As programming language Unity uses,”c#”.
    - A game programmed with Unity is “ Lara Croft Go”
    - This is a 2D and 3D engine.

5. AppGameKit:
    - AppGameKit supports “c++” and also has a build in script language called ” AppGameKit “.
    - “ Rush To Advantage ” is a game made with AppGameKit.
    - AppGameKit is a 2D 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.

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

Task 2: Answers

A)

JPG:

JPG It stands for Joint Photographic Group and is a commonly used raster format for web photographs. Since files are usually smaller, JPEG files are web friendly. The downside to JPEGs is that the image's original quality is reduced as it discards digital data through compression to keep the image size tiny. When using JPGs for high quality printing, this may become troublesome.

GIF:

A GIF or Graphical Interchange Format is a type of highly compressed image. Owned by Unisys, GIF uses the LZW compression algorithm that does not degrade the image quality. For each image GIF typically allow up to 8 bits per pixel and up to 256 colours are allowed across the image.

BMP:

BMP stands for Bitmap Image files that are used to store digital images of bitmaps. These files are independent of the graphics adapter and are often referred to as the DIB file format (device independent bitmap). The aim of this independence is to open a file on multiple platforms, such as Microsoft Windows or Mac. In both monochrome and colour formats with differing colour depths, the BMP file format can store data as two-dimensional digital images.

B)

MP3:

An MP3 file consists of MP3 frames, where a header and a data block consist of each frame. The frames are not independent and at arbitrary frame limits can typically not be removed. The file data blocks provide audio information in terms of frequencies and amplitudes.

AAC:

AAC (Advanced Audio Coding) refers to the standard of digital audio coding which represents audio files based on lossy compression of audio. It was introduced as a successor to the MP3 file format, taking into account the lateral problems facing the implementation of new ideas in the encoding process cantered on the advancement of data compression methods.

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

Research the following in your own words:

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

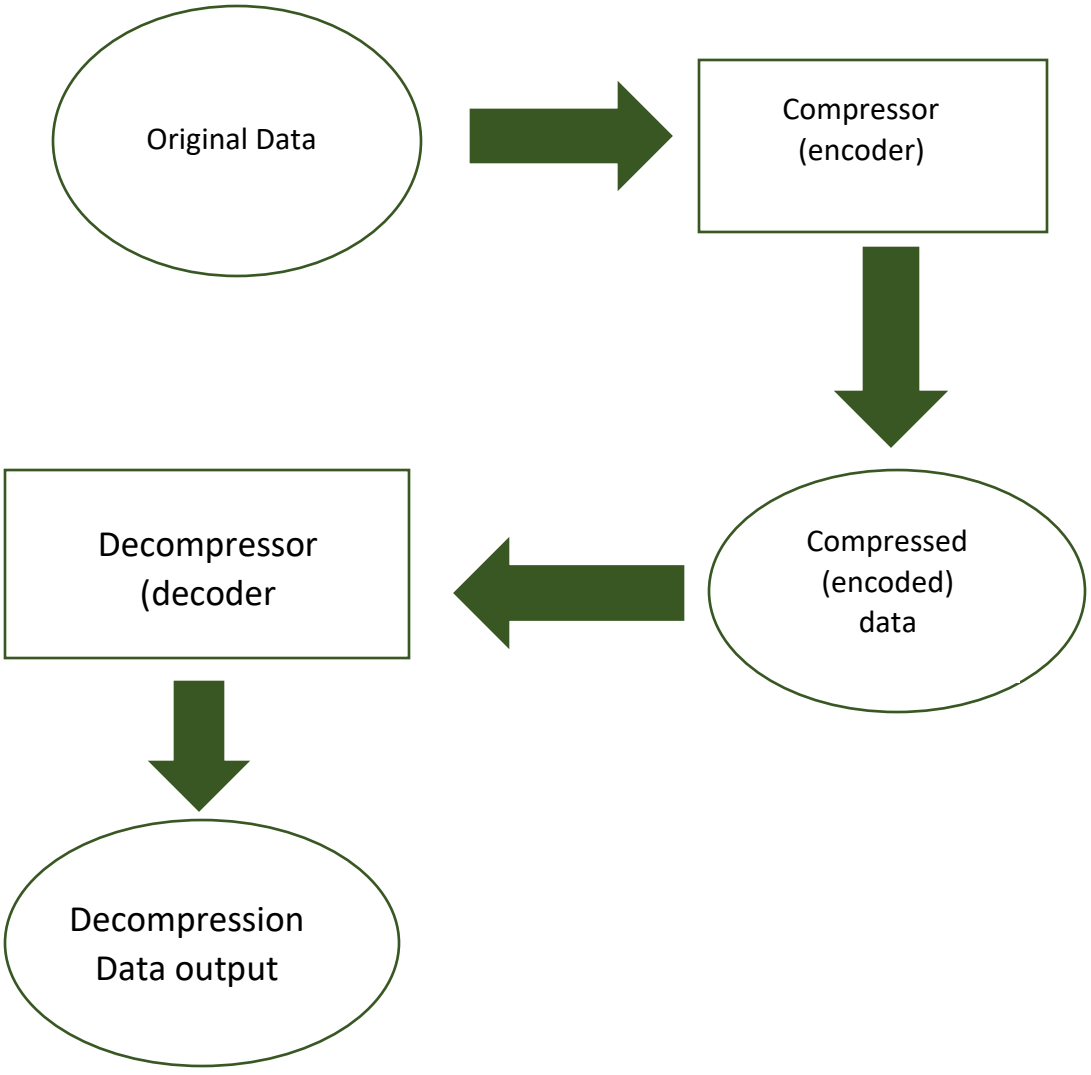
b. Explain in detail using diagrams how compression in an audio file works. The diagram must be originally drawn by yourself, and not copied and pasted.

Task 3: Answers

A)

Image compression minimizes the size of a graphics file in bytes without reducing the image quality to an inappropriate point. The file size reduction makes it easier to store more images in a given volume of storage or memory space. The time taken for photographs to be submitted over the Internet or accessed from web sites is therefore decreased. There are many ways in which it is possible to compact image files. For Internet use the JPEG format and GIF format are the two most popular compressed graphic image formats. For photos, the JPEG technique is most frequently used, whereas the GIF technique is widely used for line art and other pictures in which abstract forms are relatively plain.

B)



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**