Advanced Games Programming

CGP600 – AE1

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*Word limit: 2000 words*

1. *How you and the group analysed the requirements to create the tasks and the process of allocating the tasks. If you reference other group members’ contributions it must be made clear which group member did what.*
2. *How you designed your allocated tasks, along with any problems encountered and the application of additional research performed.*
3. *A critical discussion of the methods, benefits and constraints of group work in the design process.*
4. *Supporting evidence, including Derived Tasks, Pseudocode, Flow Charts, Class Diagrams, Entity Relationship Diagrams, Dependencies, Testing Plans, Critical Elements, and Schedules.*

# Design Theme

[GROUP]

The design theme we chose to create was a space themed game.

*The group should decide on a* ***design theme*** *that the game should try to follow, but as the game design is* ***not being assessed*** *this does not have to be sophisticated or elaborate. Remember, it is the* ***software design*** *for your game that is being assessed in the first coursework.*

*[NOT MARKED]*

# Documentation, Analysis and Design

[INDIVIDUAL]

[WRITE HERE]

*Each member should perform software analysis and design on each task that has been allocated. You do not need to follow a particular formal method for this, but you should show evidence of logical analysis of the problem (e.g. by using pseudocode and flow diagrams to work out the logic of each task) and derivation of classes with methods/attributes required to implement the task.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***CRITERIA*** | ***A1 – A4*** | ***B1 – B3*** | ***C1 – C3*** | ***D1 – D3*** | ***F1 – F3*** |
| ***Documentation, Analysis, and Design***  ***(learning outcomes K1, C1, P1)***  ***(55%)*** | ***Complete design of operations of the game has been derived from requirements, including justification for the design of the classes.***  ***Advanced functionality has been incorporated into the design beyond the core requirements***  ***Design is elegant, and/or justifiably derived from multiple potential solutions.***  ***Optimisation, extensibility and reuse are considered.***  ***Wide ranging discussion of game/OO/3D development techniques and/or design changes.*** | ***Complete design of operations of the game has been derived from requirements, including justification for the design of the classes.***  ***Significant extra functionality has been incorporated into the design beyond the core requirements***  ***Design is complete, clear and justified.***  ***Good discussion of game/OO/3D development techniques.*** | ***Complete design of the basic operations of the game, derived from the requirements.***  ***Design should include a small number of features besides the core requirements.***  ***Basic discussion of game/OO/3D development techniques.*** | ***Mostly complete design of the basic allotted tasks, derived from the requirements.***  ***The design may be vague and inconsistent in parts.***  ***Little discussion of game/OO/3D development techniques.*** | ***Inadequate understanding of theory leading to poor or non-existent problem solving attempt.***  ***Analysis is simplistic with inaccuracies and omissions.***  ***Design not appropriate or does not solve problem.***  ***No discussion of game/OO/3D development techniques.*** |

# Task Breakdown and Rational

[INDIVIDUAL]

[WRITE HERE]

*The group should analyse the game design to initially* ***break it down*** *into a* ***small number of tasks*** *that will contribute to the final full implementation of the design. These tasks describe the functionality of the basic brief and any additional functionality you have decided to implement (e.g. player movement, graphical techniques, collisions, HUD, game states, entity management, and AI). You should carefully consider how the separate tasks will work and/or* ***communicate with each other****. Don't forget you need to keep track of who did what and when and why for the final submission (e.g., keep track of how each member contributed and any problems encountered). Remember you are being* ***assessed on the software design*** *not the game design. Inclusion of the game design as a separate appendix might be useful for context, but it will not contribute towards the final grade.*

*Each member of the group should be allocated a number of the tasks. Care should be taken to* ***distribute these fairly****.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***CRITERIA*** | ***A1 – A4*** | ***B1 – B3*** | ***C1 – C3*** | ***D1 – D3*** | ***F1 – F3*** |
| ***Task Breakdown and Rational***  ***(learning outcomes C1, T1)***  ***(35%)*** | ***Highly detailed list of User Stories, including story justification, refinements, task derivation, time scales, dependencies, priorities and critical paths.***  ***Task breakdown well thought out and balanced, with good rationale.*** | ***Detailed list of user stories, including derivation of required tasks, time scales, task dependencies and priorities.***  ***Task breakdown reasonably well thought out and balanced, with some basic rationale.*** | ***Well defined list of user stories, including derivation of required tasks and time scales.***  ***A small number of tasks may be missing or ill-defined, or the task breakdown is suboptimal.*** | ***Basic list of User Stories, but lacking in detail.***  ***Partial derivation of tasks of the core requirements of the game. The tasks may be vague and inconsistent in parts.*** | ***Inadequate understanding of problem leading to poor or non-existent attempt at designing user stories and deriving tasks.*** |

# Critical Discussion of Group Work

[INDIVIDUAL]

[WRITE HERE]

*Each group member should individually reflect on the group work that has been done, including the processes used, problems encountered and solutions found. Some discussion of strengths, weaknesses and improvements that could be made to the process should be considered.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ***CRITERIA*** | ***A1 – A4*** | ***B1 – B3*** | ***C1 – C3*** | ***D1 – D3*** | ***F1 – F3*** |
| ***CRITICAL DISCUSSION OF GROUP WORK***  ***(learning outcomes C2)***  ***(10%)*** | ***A thorough and detailed reflection on the group work design process with detailed explanation of what problems occurred and how they were or could have been resolved.*** | ***Detailed evidence of reflection on the group work design process, including what has been learnt and what improvements could be made*** | ***Evidence of reflection on the group work design process, including valid strengths and weaknesses.*** | ***Some evidence of reflection on the group work design process. May be brief or unclear in parts*** | ***Inaccurate and/or largely incomplete reflection of the group work design process.*** |

# Appendix

[INDIVIDUAL]

*The following requirements* ***must be met****:*

1. *It should be a 3D game, written with Object Oriented C++, using Visual Studio and DirectX.*
2. *The player should be able to move around an environment (real-time & interactive).*
3. *The environment should be quite large, and must have static and moving obstacles (e.g., blocks, statues, and rolling rocks). These must be models (though they can be simple if you like). Some of these objects should be able to be pushed by the player, and others should be collectable.*
4. *The objects in the environment should have textures and some form of lighting.*
5. *The player should collide with objects; either stopping for static objects, or pushing them if they are moveable, or pick them up if they are collectable.*
6. *The environment must contain non-player entities represented by a model, or at least a series of connected 3D shapes, using textures and lighting.*
7. *The entities should move around the environment in some fashion (e.g., patrol an area, chase or run away from player, and fly).*
8. *The entities should collide with objects. This should cause the entities to perform an action (e.g., random, predefined direction change, and fly away).*
9. *There should be some form of interaction between the entities and the player based on collision detection (e.g. player/entity damage/death, change of behaviour, and start conversation).*

*Additional grades are achieved through enhancements to the basic game requirements (e.g., innovation and robustness).*

*Examples of such enhancements include:*

* *extending the game to use advanced features, such as, procedural content, physics, or AI;*
* *using advanced DirectX/Windows/Shader techniques;*
* *using more sophisticated techniques for core game features, such as, managing the scene and collision detection;*
* *optimising game performance;*
* *good object-orientated design, with the game and its constituent objects extensible and reusable.*

*These are just a small set of possibilities, look at what other games do and use your imagination to come up with others. Some of these enhancements will require additional research of 3D, object-oriented and game programming techniques not explicitly covered in the unit.*

## Appendix A

Derived Tasks

Appendix created by Sean Khanna

## Appendix B

Pseudocode

Appendix created by James Coyle

## Appendix C

Flow Charts

Appendix created by James Coyle

## Appendix D

Class Diagrams

Appendix created by Sean Khanna

## Appendix E

Entity Relationship Diagrams

Appendix created by

## Appendix F

Dependencies

Appendix created by

## Appendix G

Testing Plans

Appendix created by James Coyle

## Appendix H

Critical Elements (Gantt Chart?)

Appendix created by Sean Khanna

## Appendix I

Schedules (Gantt Chart)

Appendix created by Sean Khanna