

Computer Games Development

TDD (Technical Design Document)

Year IV

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**28/10/2021**

# Declaration

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Software Architecture

Diagram

Description automatically generated

# Features

* Creation of Rectangles & Circles

1. Create inheritance tree of type Shape
2. Create a derived class of type Rectangle
3. Create a derived class of type Circle
4. Have Rectangle class be created via width and height.
5. Have Circle class be created via radius.

* Create ADSR Envelope for physics movement for Shapes

1. Create movement for moving left and right.
2. Create movement for jumping up and falling.
3. Create setters for acceleration, jump height, gravity etc.
4. Having Easing functions to allow for smoother movement.

* Create Collision Handler for Shapes

1. Create collision detection handler for SAT.
2. Create collision detection handler for Diagonals.
3. Create collision displacement handler for SAT
4. Create collision displacement handler for Diagonals

* Create Spatial partition for faster collision detection

1. Create grid for SFML window.
2. Have grid return the types of data within a cell of the grid.
3. Make collision detection utilize the grid for faster collision.

# CRC Cards

|  |  |
| --- | --- |
| **Class Name:** Shape |  |
| **Responsibilities** | **Collaborators** |
| Allow for derived class for different shapes | Rectangle, Circle |
| Handle render of shapes | sf::RenderWindow |
| Handle update of shapes | sf::Time |
| Handle setting of position of shapes | sf::Vector2f |
| Handle setting velocity of shapes | sf::Vector2f |
| Getting the type of shape | Enum class Type |

|  |  |
| --- | --- |
| **Class Name:** Rectangle |  |
| **Superclasses:** Shape |  |
| **Responsibilities** | **Collaborators** |
| Allow construction of rectangles | Rectangle width/height |
| Allow use of setters/getters of super class Shape | Shape |

|  |  |
| --- | --- |
| **Class Name:** Circle |  |
| **Superclasses:** Shape |  |
| **Responsibilities** | **Collaborators** |
| Allow construction of circle | Circle radius |
| Allow use of setters/getters of super class Shape | Shape |
| **Class Name:** ADSREnvelope |  |
| **Responsibilities** | **Collaborators** |
| Allow for handling of inputs | sf::Event |
| Allow for movement in the left direction | Bool isMovingLeft |
| Allow for movement in the right direction | Bool isMovingRight |
| Allow for jump movement | Bool isJumping, bool isGrounded, Shape |
| Allow for falling movement | Bool isfalling, bool isGrounded, Shape |
| Allow for setters for acceleration, height of jump, gravity ect. | Game |

|  |  |
| --- | --- |
| **Class Name:** CollisionHandler |  |
| **Responsibilities** | **Collaborators** |
| Allow for Collision detection/displacement for SAT | Shape |
| Allow for Collision detection/displacement for Diagonals | Shape |

|  |  |
| --- | --- |
| **Class Name:** Game |  |
| **Responsibilities** | **Collaborators** |
| Update Game | Shape, CollisionHandler, ADSREnvelope |
| Check for button presses/mouse clicks | sf::Event |
| Render Game | Shape, sf::RenderWindow |