* **Purpose/Overview**

This graphics software is a tower defense game based on the college experience. It consists into shooting down various forms of homework using equations and independent support towers.

* **Requirements**

The application will be able to perform two main functions:

* + - (1) individual shooting – the user controls a student who is able to shoot down incoming enemies with the use of the mouse
    - (2) tower shooting – the user can purchase independent towers able to shoot enemies automatically
* **Classes**

The application will contain ten classes:

* (1) ‘GameObject’ – super class for all of the graphic objects of the game
* Member Data
* “myX”, “myY” (double) – 2D coordinates
* “myVX”, “myVY” (double) – speed of 2D movement
* “myImage” (QImage), “myRect” (QRect) – image and its rectangle for collision checking
* Methods
  + Constructors/Destructors
  + Getters/Setters
  + Move methods
  + Intersect check – bool method that check for collision between two GameObjects
* (2) ‘Enemy’ – super class for all of the enemy objects of the game
  + (7) ‘Problem’ – weakest enemy of the game (heath 1, speed 1)
  + (8) ‘Assignment’ – intermediate enemy (health 2, speed 2)
  + (9) ‘Paper’ – stronger enemy (health 5, speed 4)
  + (10) ‘Midterm’ – strongest enemy (health 18, speed 4)
* (3) ‘Tower – support class that shoots automatically detects enemy thanks to a ‘range’ variable (QRect)
* (4) ‘Bullet’ – projectile aimed at enemies fired of when they are detected or when the mouse is clicked
* (5) ‘Student’ – character controlled by the player; shoots equations at enemies
* (6) ‘TDefense’ – Qwidget inherited class in charge of the timer of the events
* **Global Data/Functions**

The code will revolve around a single global data in the main function:

* “window” (TDefense) – this object will encompass all of the variables and methods used within the classes of the program, which will enable it to perform all operations and interact with the user
* **High-level Architecture**

This program will ensure the flow of data through the use of nested classes within the ‘TDefense’. The event methods provide direct GUI interaction with the user.

* **User Interface**

This software will use a GUI coupled with keyboard input. In order to interact with the console, the user will have to enter commands, as well as click the mouse.