**Problem Statement:**

Using the Unreal 4 engine, I want to create a singular level in the genre of a horde survival game using the standard control scheme and camera perspective of the MOBA Genre. With this project, I will primarily focus on the programming aspect of the process to fully flesh out gameplay mechanics and have a programming portfolio piece for my gameplay programming abilities.

**Deliverables/scope:**

* 1 week (end of week 3)
  + Game design document made.
    - This will give a stronger basis for what I need to program specifically and the initial values of stats until play testing starts.
* 1 - 2 weeks (due by end of week 5)
  + Character objects and stats programmed in.
    - Base player character entity with possible stats
    - Base enemy character entity with possible stats
    - Nexus entity with stats
    - Turret entity with stats
  + Base level layout
* 2 - 3 weeks (due by end of week 8)
  + Pathing system for player character and enemy characters
    - Player character navigates where player right clicks and actions can be queued with shift right clicking
    - Contextual right clicking so that a player character will auto attack when right clicking an enemy
    - Enemies path to the Nexus (the main base that the player defends) and reacts to the player fighting them
* 1 weeks (due by end of week 9)
  + Waves
    - Wave timer
    - Scaling of numbers and stats
* 2 weeks (due by end of week 10)
  + Item System
    - Item shop
    - Gold system
    - Items determine what activatable skills and passives the character has
    - UI work to present these options in a logical manner
* 2 weeks (due by end of week 12)
  + Minion types
    - Have multiple minion types that function differently from an abilities perspective and AI perspective
    - Different coloring to distinguish types
  + 1 Boss variant
    - Extra abilities
    - Passives that modify the minions accompanying them
* 1 weeks (due by end of week 13)
  + Turrets
    - Have slots on the map for the player to purchase turrets to aid in the defense
    - Turrets are targets by minions and turrets shoot minions
* 1-2 weeks of time interspersed throughout project (due by end of project/semester)
  + Debugging and polish
    - Optimization
    - Gameplay balance changes
    - Debugging code in case of roadblocks.
    - If project is in a stable state earlier than expected, the project can be further fleshed out with adding more items, bosses, minion types, ect. to add polish to the product.

**Potential Outcomes & Conclusions:**

* A much higher level of depth of understanding of the unreal 4 code ecosystem
* Further experience in game design
* A portfolio piece showing off my gameplay programming skills
* 1 proof of concept playable level of the horde survival idea

**Additional Notes to professor:**

From a tech stack, I will be both utilizing the scripting functionality of the blueprint system as well as coding in C++ to create the game prototype. I will also be using GitHub for versioning out my project and always having access to a stable build. I will also be implementing the Agile development methodology’s principle of “sprints” of 1-week intervals to keep myself accountable and on task at a level defined smaller than the timeline. Work on the design document has already started as a part of the drafting phase for the proposal but I want to have it as solid as possible which is why I have it due at the end of the 3rd week.