**Advanced Digital Media Projects:**

Gameplay Programming project in Unreal 4 engine

Use of a mixture of C++ and blueprint

**Overview:**

The goal of this project is to do all the gameplay programming to make a wave based, horde style survival game prototype with MOBA style controls/dynamics.

**Baseline Mechanics/dynamics.**

The game will be a solo experience with the player starting as a basic character with no abilities predesignated. The idea of this is that the abilities will be allocated to the player character through the items the player chooses to buy throughout a match so that they can adapt their character on the fly in reaction to the waves and not be stuck in a role.

The goal of the game is to last as many waves as possible defending their Nexus from destruction from the oncoming waves of varying minions. With each wave, difficulty will scale to meet the player with a challenge as their character progresses with items, levels, and purchasing of turrets in designated areas. Each wave lasts 2 minutes at maximum or whenever the last minion is destroyed.

Starting the match, the player will start off with a basic item shop requiring them to choose either a ranged item or a melee item to start them off with a passive and how their auto attack functions (hence the ranged or melee item). The player will have no turrets to start out forcing them to face the first minions head on at the start.

After 15 seconds after game start, the first wave of minions is called out to attack the Nexus. These minions are very simple, do lower damage, and ignore everything in their pathing besides the nexus. This provides the player a simple way to learn the ropes of the game or the basic archetype of combat that they chose through their first item choice.

Every 2 waves a new enemy type is rotated into the fray adding variety while allowing the player to adjust and learn from mistakes. With this, enemy types like Healer minions, Assassin minions, Tank Minions, and siege minions are introduced in (reasonably) growing quantities forcing the player to figure out optimized builds and even entire restructuring of their character build to come out on top.

Every 10th wave a boss minion is sent in to play as a test for the player to apply what they’ve learned and prove they are worthy of continuing to the next set of waves. Each defeat of a boss leads to a buff to the enemy minions being introduced to keep the player on their toes and resets the number of minions to a comparable level of the first wave to allow adjustments to the buffed versions of the minions to be made.

The first Level type is a basic lane that splits and recombines 2 times, once in the middle of the map and then once at the nexus. With each split of the lane there are corridors between the lanes allowing the player to rotate between lanes and react to pressures fast.

**Stats:**

**Player**

* Health: Life points that sustain the character. If depleted the character dies.
* Armor: Accumulates for a percentage negation of hits
* Move Speed: The speed that the player character will move
* Attack damage: damage for auto attacks
* Attack speed: speed of auto attacks
* Spell power: increased effect of spells of player character (i.e. increase of damage, time, armor, or healing)
* Slots: Each item purchased by the player resolves to an ability slot that the player can activate.
  + Players have 4 of these bound to the standard QWER keys
* Passive: Gained by first item modifies the play style of character in some manner by giving them a unique passive ability that plays into how all of their abilities function
* Gold: Gained through defeating enemies and surviving waves. This currency can be used to buy items to fill out your ability slots.
* Level/exp: Gained through defeating enemies. Each level provides a stat boost to a character

**Ability**

* Cooldown: Depending on the effect, each ability will have varying times that the user will be unable to cast the ability for to maintain

**Weapon**

* Skill
* stat enhancements.

**Turret**

* Health
* Armor
* Attack damage
* Attack speed
* Passive (i.e. Poison, explosive, multi-shot, etc)

**Minions:**

* Health
* Armor
* Attack Damage
* Attack speed
* Spell power: much more simplified for scaling
* Ability slot: singular ability if a specialized unit

**Bosses:**

* Health
* Armor
* Attack Damage
* Attack speed
* Spell power: much more simplified for scaling
* Ability slots: equivalent to the player skill limits
* Passive: auras that enhance minions around them in the wave that they’re a part of

**Item shop:**

* **Starter Items:**
  + Melee
    - Ebon Bulwark
      * Increases armor
      * Increased health
      * Passive: Gives player temporary shield health when low on health
  + Ranged
    - Thorium blaster
      * Faster starting attack speed
      * Increases base crit rate
      * Passive:
* Ability Items:
  + Basic ability items
    - Magister’s might (levels 1-3)
      * Ability: Throw a fire ball which explodes on hit in an AOE
        + Damage scales (50 – 100 – 200)
        + Mana costs (40mp – 80mp – 100mp)
        + Range: need to test
    - Hell-fire axe (levels 1 – 3)
      * Ability: damage in an AOE spinning around the character 3 times
        + Damage per hit (25 – 55 – 85)
        + Mana cost (35 – 65 – 95)
        + 3 characters in a row length
    - Quantum booster
      * Ability: dash in a forward line damaging all minions between dash start and end points
        + Damage (40 – 80 – 120)
        + Mana ( 20 – 40 – 60)
        + Range: need to test
    - Paladin’s plate-mail
      * Ability: Activates a shield which provides temporary shield health to mitigate damage to player
        + Health (150hp – 250hp -400 hp)
        + Mana (50 – 75 – 125)
    - Smuggler’s contingency
      * Ability: fires a piercing projectile hitting every enemy in its path
        + Damage (40 – 80 -120)
        + Mana ( 20 – 40 – 60)
        + Range: need to test
    - Vampiric dagger
      * Ability: attack and sapp the health of one target reviving your own health bar
        + Damage (60 – 120 – 180)
        + Healing (30 – 60 - 90)
        + Mana (30 – 60 – 90)
        + Single target
  + Ultimate ability Items
    - Singularity cannon
      * Ability: Creates a large AOE DOT that explodes at the end of its duration
        + Damage over time ( 30/sec – 45/sec -60/sec)
        + Explosive damage (200 – 300 – 450)
        + Mana (120 – 160 – 200)
        + Size and range need to be tested
    - Frost beam
      * Ability: fires a beam that does damage over time and slows/freezes minions based off of time in laser
        + Damage over time ( 40/sec – 70/sec - 100/sec)
        + Mana (120 – 160 – 200)
        + Size and range need to be tested

**Minion Variants:**