Project 3

(Make tasks as small as possible)

1. ~~Blowhole particle system~~

##### ~~Whale Class~~ [Medium, 1-3 hrs] - done, needs polishing

* 1. Water-Surface Movement
     1. ~~Whale moves on surface of water, cannot clip through terrain/obstacles~~
     2. ~~Holding forward moves forward~~
     3. ~~Holding left/right moves to the left/right~~
     4. ~~Holding back goes backwards~~
     5. ~~Jump button causes whale to jump~~
     6. ~~Non-conflicting movement combos move in both directions~~
     7. ~~Conflicting movement combos (forward and back) cancel out~~
  2. Manipulatable Variables In Class
     1. ~~Speed~~
     2. ~~Turn Rate~~
     3. ~~Jump Height~~
     4. Jump Speed
     5. Etc..

1. ~~Race Gamemaster Class~~ [Medium, 3-5 hrs] - Done, needs some testing to ensure checkpoints get hit correctly
   1. Keeps list of checkpoints in map
   2. List of players/NPC Racers maintained
   3. Keeps track of checkpoints passed for each individual
      1. Each character has a variable for “checkpoints passed”, game master is constantly checking that variable vs the “total checkpoints” in each map.
      2. Checkpoints must increment, cannot turn around back and forth on one checkpoint to win
      3. Keep track of laps done for each user vs expected amount, possibly flash laps left when player passes finish point each time.
   4. Ends race when win condition is met
2. ~~User Interface~~[Medium-Difficult (nobody knows this) 5hrs] - Rohan & Austin
   1. Title Screen
   2. Main Menu
   3. Settings Menu
      1. Adjust Controls
      2. Adjust Video Settings
   4. Singleplayer Menu
      1. Choose number of AI
      2. Choose Difficulty
      3. Choose Map
      4. End of Race Screen (Ranking, Play Again, Return to Title)
   5. Multiplayer Menu PUSH TO PROJECT 4
      1. Choose Number of Players
      2. Choose Map
      3. End of Race Screen (Ranking, Play Again, Return to Title)
   6. Link all UI Pages Together
   7. In-Game Pause Menu
      1. Exit to Main Menu
      2. Resume
3. ~~Obstacle Class~~ [Difficult 4 hrs] - Alex if extra time after other tasks
   1. ~~When Whale (player) or Whale (AI) collides with obstacle, Whale is bounced back and stunned for a second.~~
   2. ~~Obstacle breaks when collided with?~~
      1. ~~Destructible mesh?~~
   3. If currently speed-boosted, break object, go through it, do not get stunned.
4. ~~Speed-Boosting Collectible~~ [Easy-Medium, 3hrs] - Alex
   1. ~~Krill Model Imported~~
   2. ~~Disappears when run over by one whale~~, reappears after a set time
   3. ~~When whale runs over it, provides whale a temporary speed boost~~
   4. ~~Does a cool rotate thing~~
5. ~~Oil Slick Obstacle~~ [Medium, 3hrs] - Alex
   1. ~~Placeholder asset/particle if no existing asset~~
   2. ~~While whale is inside its space, slows whale’s speed~~
   3. ~~NEED System for “decals” or particles floating on water surface~~
      1. ~~Temporary solution - static floating object~~
6. ~~Basic AI~~ [Difficult, 5hrs] - Quinten
   1. Whale AI Inherits from Base Whale Class
   2. Fine-tune Navmesh Navigation
   3. Sensor Radius That Detects Objects with Certain Tags
      1. Avoid Obstacles (Oil Slicks, Destructibles)
      2. Navigate towards Collectibles
   4. Stop Moving when Race is Won
   5. Tune Values so AI is Nominally Competitive With Player
      1. For final version - AI seriously competitive with player
7. Art Assets & Animation [Depends on assets needing work] -Austin [Ongoing for P4]
   1. Make Sure (Nearly) Every Action for the Whale has a Corresponding Animation Playing
   2. ~~Create wooden box texture (will be placed on normal cube)~~
      1. NOTE: May need to model a box it in separate parts to be destructible
      2. Or <https://www.assetstore.unity3d.com/en/#!/content/7193>
   3. Upload Static Krill Model (Doesn’t need animation)
   4. Replace Austin’s Unoptimized Ocean Library
8. Sound [Easy 2hrs (premade), Medium 5hrs (recorded)] -All [Ongoing for P4]
   1. Record/Import Sound
   2. Implement Sound Based on Triggers
9. Design Actual Level Using Components Above/Balance [Difficult, Ongoing] -All? [Pushed to P4]
   1. Plan and Draw Level Map, with Optional Paths
   2. Sculpt Level in Unity, Place Assets
   3. Implement Collectibles and Obstacles to Cause Players to Make Meaningful Choices
   4. Test Level for Fun

Project 4 - Prioritized and Annotated for Final Sprint

1. Gameplay Design Alex
   1. ~~Level Design~~ 
      1. Three Different Main Levels [Medium, 8hrs]
         1. Level 1 - Aduloo
         2. Level 2 - “Shipyard”
         3. Level 3 - “Minefield”
      2. Secret Space Map [Medium, 2hrs] CUT
      3. Multiple Paths [Implement for future maps]
         1. One long but easy, one short with hunters/obstacles?
         2. Choice between surface and underwater is clear
         3. Why might you choose one over the other?
      4. Incentivize path choice with power-ups, and obstacles
   2. ~~Design More powerups/collectibles [Medium, 3hrs, depends on #]~~
      1. ~~Speed-boosting Krill~~
   3. ~~Obstacle design~~ [Medium, 3hrs, depends on #]
      1. Oil Slicks slow you down
      2. Floating objects
      3. Whale hunters (see below)
   4. Multiple Whale Characters with Different Stats [implementation - Easy 2hr, balancing -Difficult 3hr] CUT
   5. ~~Gamemode Types (Optional) Just MP~~
2. ~~Multiplayer Functionality~~ [Difficult, 10hrs - splitscreen possibly easier] Jakob, Austin
   1. Networked Gameplay
   2. Split-Screen
3. ~~Fully Tune Movement Mechanics~~ [Difficult, 2hr] Austin, Rohan
   1. Swim Speed
      1. Sprint?
   2. Rate of Turning (Whale drifting????)
   3. Strafes? Rotate underwater
   4. Jump
   5. Underwater Movement
      1. 360, or flat? Dive to any level
      2. Jump brings you to surface?
4. ~~Polish UI~~ [Medium once UI learned, 3hrs] Rohan
   1. Title Screen
   2. Main Options (Settings, Play Game, Exit Game)
   3. Settings Menu
      1. Adjust Controls
      2. Adjust Video Settings?
      3. Audio settings?
   4. Play Game
      1. Brings User to Next Menu (Singleplayer, Multiplayer, Return to Main Menu)
   5. Singleplayer
      1. Choose number of AI Focus on 2P only
      2. Choose Difficulty
      3. Choose Map
      4. End of Race Screen (Ranking, Play Again, Return to Title)
   6. Multiplayer
      1. Choose Number of Players 2P Only
      2. Choose Map
      3. End of Race Screen (Ranking, Play Again, Return to Title)
5. ~~Whale Master Class~~ [Easy, 1hr] Adapt base whale - Jakob
   1. Parent class of all player whales and all AI whales
   2. Facilitate multiple opponents, differing stats
   3. Player Class
      1. Movement control enabled, AI disabled
      2. Multiple children of player class for multiple player characters
   4. Better AI [Difficult, 10hrs] Quinten - Focus on improving NavMeshAgent pathing
      1. Better Pathfinding
         1. Look for Unity plugins
         2. A\* and/or Dijkstra pathfinding algorithms likely not necessary
         3. Must avoid obstacles and hunters
         4. Turn Around if disoriented
         5. Uses powerups, alt routes once available
            1. Changes route/strat between plays
6. Asset Creation [Difficult, 8hrs] Austin
   1. Multiple Whale Characters Modeled and Rigged CUT
   2. Whale Hunters Modeled and Rigged CUT
   3. More Variation in Static Background 3D Assets
   4. ~~Music Creation~~
   5. ~~Sound-effect creation~~
      1. Mandatory whale-sound recording session
   6. ~~User Interface 2D Design~~