Work breakdown

Week 3:

- Set up a modified game environment tailored for agent training
    - Ball resets after it drops outside of game
    - Make sure paddles can’t move outside the walls
- Design Agent functions for paddle to find ball object before ball object goes out of bounds
    - Observe ball object function
    - Reward/penalty function
    - Action function

Week 4:

- Implement Agent functions
    - Observe ball object function
    - Reward/penalty function
    - Action function
- Test Agent functionality
    - Ensure agent will actually find the ball
    - Ensure agent doesn’t go outside of the walls (should be covered by modified game environment)
- Train an Agent

Week 5:

- Train Agent with multiple Prefabs (use Tensorboard visualization)
- Integrate trained Agent into actual game board and review performance
- Modify Agent if needed and re-train if needed

Week 6:

- Improve training:
    - Use modified config file in training
    - Add randomness? (ie random ball starting position?)
- Train Agent with multiple Prefabs

Week 7 (if needed):

- Modify agent functions to compare performance against the first, trained agent

Current Tasks:

- Assist with gameboard development
- Research ML agents in Unity
- Determine platform to train model on
- Determine model structure
- Determine edge cases, if any, that agent needs to account for (ie can't find the ball)
- Design Agent class
- Design agent methods
- Begin creation of ML agent structure
- Define observations for agent
- Define reward/loss function framework
- Buildout agent movements
- Buildout penalty/reward functions for agent
- Integrate agent into paddle object
- Begin training
- Train and test agent with multi-epoch approach
- Source sample data to train model
- Source brain file
- Integrate brain file into main gameplay/game functionality
- Test/train split of sample data
- Refine training/learning parameters
- Fully integrate agent into agent performance
- Work on 2 player side by side mode
- Adjust penalty reward if needed
- Finalize agent.player structure
- Final model adjustments