

# CS 210: Final Project Proposal

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### Fall 2024

# TOWER DEFENSE

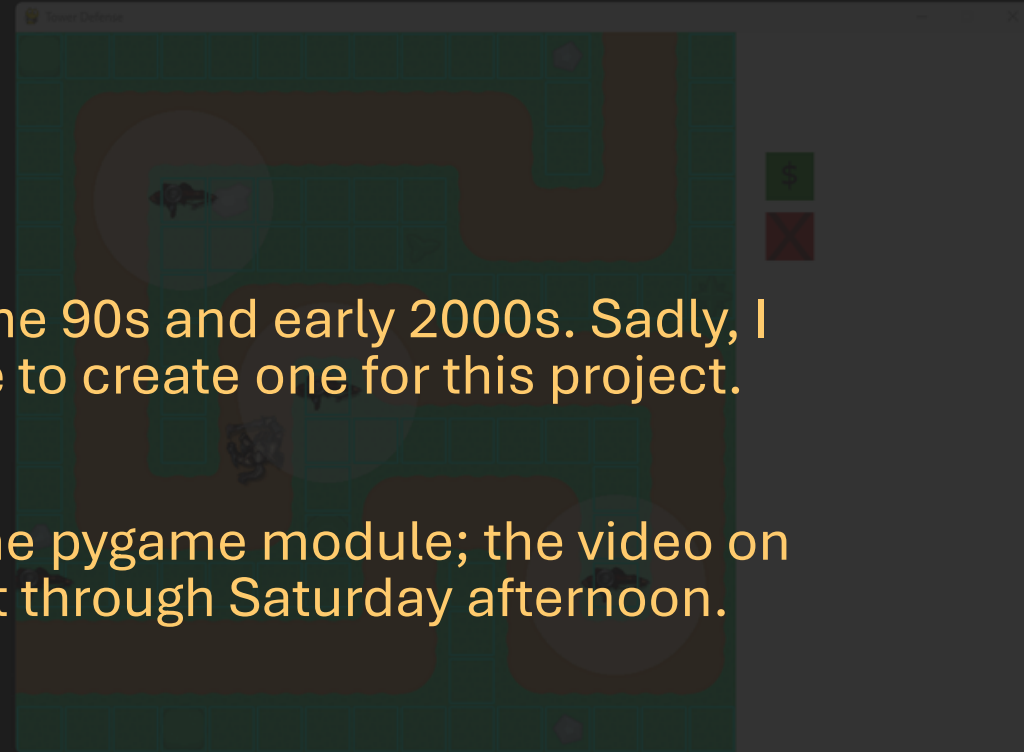


```
14 with open('FinalProj\\levels\\level.tmj') as file:
15     world_data = json.load(file)
16
17 def create_turret(mouse_position):
18     mouse_tile_x = mouse_position[0] // c.TILE_SIZE
19     mouse_tile_y = mouse_position[1] // c.TILE_SIZE
20     mouse_title_num = (mouse_tile_y * c.COLS) + mouse_tile_x
21     if world.tile_map[mouse_title_num] == 25:
22         space_is_free = True
23         for turret in turret_group:
24             if turret.tile_num == mouse_title_num:
25                 space_is_free = False
26                 return
27         turret_group.add(Turret(mouse_position))
28
29 # Create the turret
30 create_turret(mouse_position)
```

Hello from the pygame community. <https://www.pygame.org/contribute.html>  
PS G:\My Drive\School\01\_Fall2024\CS210> & C:\Users\User01\AppData\Local\Programs\Python\Python312\python.exe "g:\My Drive\School\01\_Fall2024\CS210\FinalProj\main.py"  
pygame 2.6.1 (SDL 2.28.4, Python 3.12.4)  
Hello from the pygame community. <https://www.pygame.org/contribute.html>  
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PS G:\My Drive\School\01\_Fall2024\CS210>

# Summary

- I always loved the old tower defense games from the 90s and early 2000s. Sadly, I don't see people making them now days, so I'd like to create one for this project.
- After class last Thursday, I began learning to use the pygame module; the video on the title slide is what I created from Thursday night through Saturday afternoon.
- **Main Objectives:**
  - At least two maps, 10 waves of enemies, 1 set of towers (10 different towers in the set), tower upgrades, a perk tree and player resources.
- **Stretch Goals**
  - Multiple maps, additional sets of towers (10 in each), more enemy waves, selection marquee, audio, hero unit that the player controls.



# Data Structures/Algorithms and Usage

## • Lists

- Map tiles (array)
- Enemy movement waypoints (arrays/List/Sets)
- Tower upgrades (linked list)

## • Stack

- Temporary tower upgrades/enemy downgrades

## • Queue

- High Scores (stretch goal)
- Enemy spawns

## • Hash Table

- Available tiles for the player to build on
- Player resources
- Tower/Enemy properties

## • Tree

- Perk tree

## • Graph

- Uncertain, but relationships between towers and/or enemies will likely be involved

## • Searching

- Linear search to initialize buildable tiles

## • Sorting

- Uncertain, still considering

## • GUI

- Pygame
- Free and paid assets
- Custom assets created/modified in GIMP

