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project description:
The project is a game consisting of a tank that the user operates. There will be a line of fixed canons
on the top of the window that would fire at the user. The goal of the user is to dodge the projectiles
fired toward them and shot back at the cannons. As the user dodges projectiles and destroys the canons,
their score will go up increasing the firing rate of the cannons. Walls would be placed for the user to
take cover behind and power ups would be included. The user loses the game once their tank is destroyed.

structural plan:
-Each screen such as the start menu, leaderboard, and game screen would be in separate files
-The projectiles will be organized in a class that stores their positions and change in movement
-The points for the tank will be stored in app started
-The walls will be stored in a dictionary where the key is a tuple(x,y) and the key points to the amount
of hits that the wall can take
-The health of the tank is stored in app started
-a class would be made for enemy tanks

algorithmic plan:
-Tank Rotation:
    -Each corner of the tank is stored in a 2D list
    -The tank is drawn using canvas.create_polygon
    -Each point is moved to the origin and a new point is calculated given the angle of rotation
    -The new x is calculated by using x*cos(angle)-y*sin(angle)
    -The new y is calculated by using y*cos(angle)+x*sin(angle)
    -link to equation in resources folder
-Turret Rotation:
    -The end point of the turret is based on the location of the mouse relative to the tank
    -The angle formed between the center of the tank and the position of the mouse is determined by using math.atan()
    -The variable t stores the distance between the two points divided by how many times 30 goes into the distance
    -The x in between is determined by using app.tankX+t*cos(angle)
    -The y in between is determined by using app.tankY+t*sin(angle)
    -link to equation in resources folder
-Enemy turret rotation:

-The enemy turret would be drawn in a similar way as the tank turret
-The turret will be drawn using the points of the turret and the points of the tank

-Projectile intersects wall
-The closest point in the wall is found
-Then the distance between the closest point and projectile center is found
-If the distance is less than the projectile radius, then they intersect
-If they intersect the projectile is removed from the list of projectiles
-Link to equation in resources folder

-projectile intersects tank
-Different cases are created where the projectile can be found intersecting the dot
-If one of the cases are True then the tank health is decreased

-map generation
-a certain number of tanks generate on the top based on the current level

TP2 update:
-created a scroller so the player keeps driving forward instead of the map resetting each level
-enemyTank class was made to spawn enemy tanks that have different movement properties(side to side, top to bottom, and tracking)
-bullet speed increases as level increases
-after level 20 bullets start to move toward user instead of in a line
-map starts to automatically shift down after level 10
-leaderboard system has been made
-a cheat mode has been made that allows a user to skip levels(for testing)

TP3 update:
-Force Field power up
-Double Barrel power up
-New Cheat Mode option: I added a new cheat mode option that makes the game never end even if the tank loses all of its health. This can be used to show off the difficulty of really high levels without having to worry about dying.

version control plan:
-For version control files will be backed up on google drive.

Folders

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Folders Name

__pycache__ resources

Files

cmu_112_graphics.py dessert.jpg game.py leaderboard.py pause.py proposal.txt