ID1110 COURSE PROJECT
TANK SURVIVAL GAME

B.TECH PROGRAMMING PROJECT REPORT

SUBMITTED BY

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1 INTRODUCTION

Background and context:
Basically games have the ability to entertain, educate, facilitate interaction, and promote expression. Games have a positive impact on various aspects of society, including personal development, entrepreneurship, and technological innovation. It helps in creative expression, personal growth, and business opportunities. As games continue to evolve it will continue to shape the future of interactive entertainment and other industries.
In the game a Tank is used which shoots the enemy tank. The tank's movements are handled by 'A' to go forward,'S' to go backward,'D' to go right,'W' to go left and the mouse is used to set the direction of the cannon. To shoot the nuke left click is used.You have a certain amount of health every time you get hit by the opponent it reduces. As your health gets over the game end's and again starts and if you kill the enemy then the enemy again shows up from a new position.

Problem statement and objectives:
To make a game in python using pygame.

Significance and motivation:
Games are a popular form of entertainment and have a significant impact on various aspects of society. This game helps in reducing the reaction time of the individual and also helps him to have a better control on its consciousness.Thus keeping us mentally healthy. It also helps in entertainment and recreation. This can be employed in various areas, such as health and fitness apps to track our progress, and maintain healthy habits. Additionally, games can be used as therapeutic tools for rehabilitation and cognitive training.
We got motivation from YACC Godot Game engine session to make a game.
Game development provides an outlet for creativity, allowing us to express our ideas, imagination, and artistic vision. It offers a unique platform to combine various art forms, such as visual design, and programming, into an interactive and immersive experience.Creating a game serves for a personal and professional growth opportunity. It allows developers to enhance technical skills, problem-solving abilities, project management, and teamwork. Game development is a driving force for technological innovation. It pushes the boundaries of hardware capabilities, graphics rendering, artificial intelligence, and user interfaces.

2 PROJECT OVERVIEW

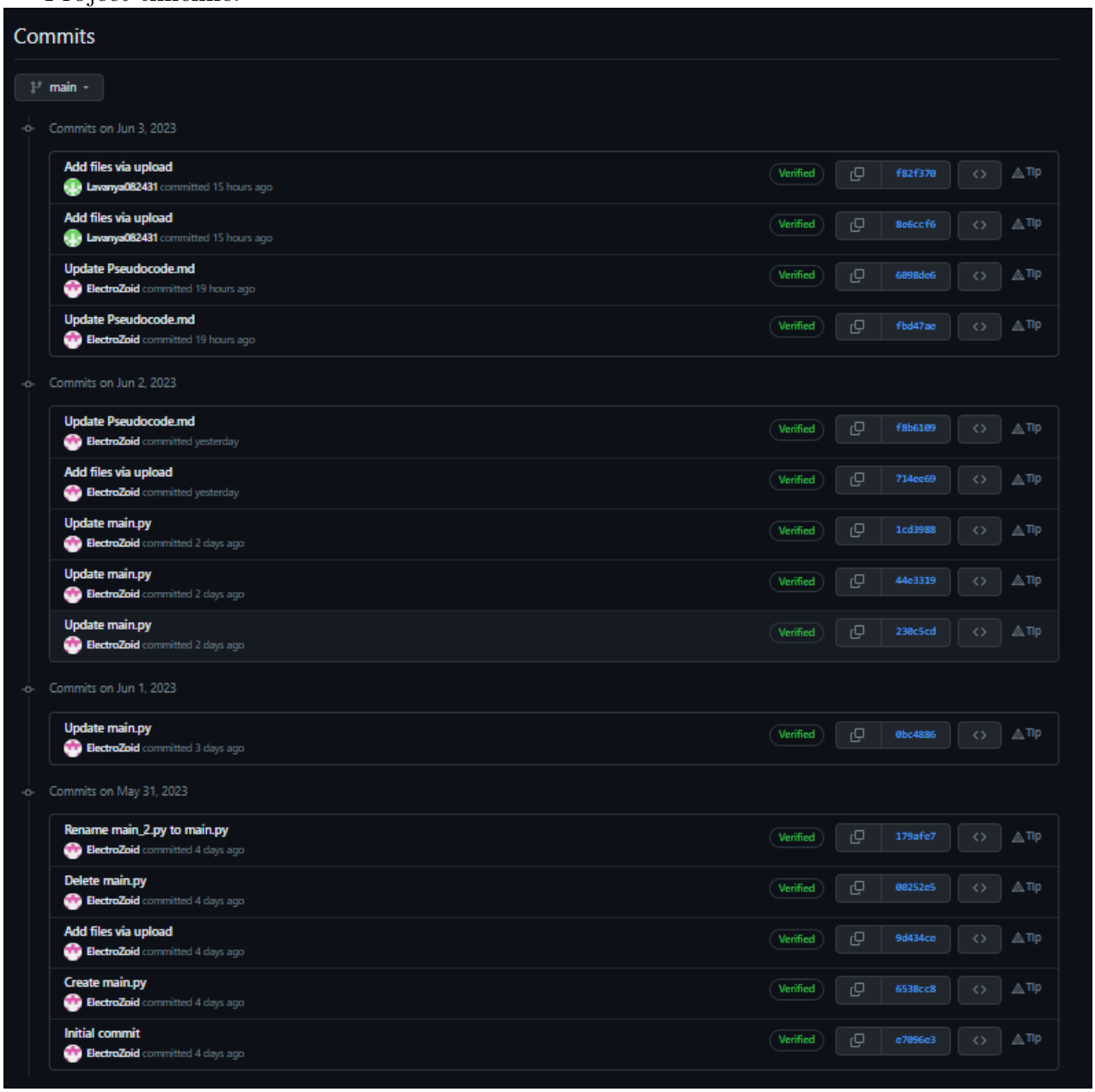
Project goals and scope:
It can be played by anyone as it's easy and understandable.In the game a Tank is used which shoots the enemy tank. It's a mind relaxing shooting game. The main aim is to make as many kills as you can.

The tank's movements are handled by 'A' to go forward,'S' to go backward,'D' to go right,'W' to go left and the mouse is used to set the direction of the cannon. To shoot the nuke left click is used.You have a certain amount of health every time you get hit by the opponent it reduces. As your health gets over the game end's and again starts and if you kill the enemy then the enemy again shows up from a new random position.After 5 kills the number of enemy becomes two after 10 it becomes 3 after 15 it becomes 4.

Project repository: https://github.com/ElectroZoid/Tank$_g ame$

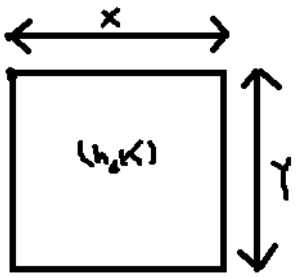
Team Members and Contributions:
[VISHAL RAHANGDALE]: [Logic, Code and Pseudo code][45 hours]
[SWADHA SWAROOP]: [Text Rendering, README.md file and Project Report][20 hours]
[LAVANYA MOGILI]: [Game assets and Game Testing to find bug][10 hours]

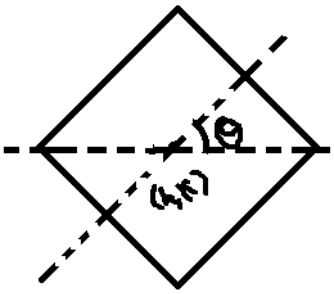
Project timeline:

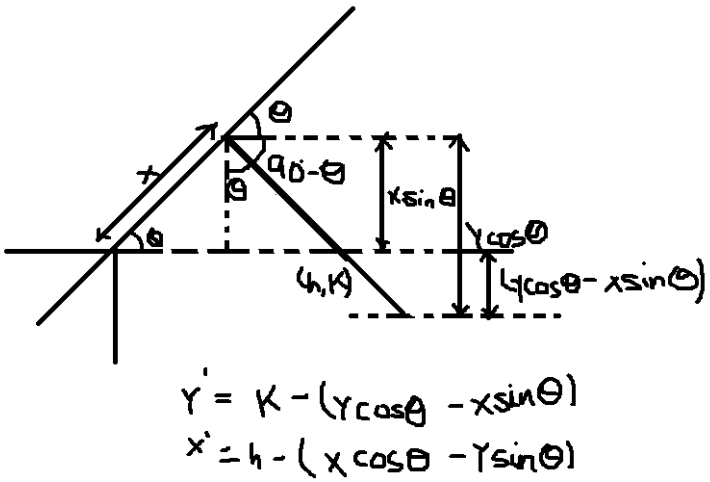


3 METHODOLOGY

Approach and methodology employed:







Tools, technologies, and frameworks used:
We have used
*object oriented programming
*concept of projectile motion
*Libraries: Random, Math, Pygame

4 CONCLUSION AND FUTURE WORK

Summary of outcomes and contributions:
We have successfully created a game using pygame in python which have not been possible with our team spirit. It can be used for recreational work. Also as Python is an easy and readable language also it has a large community it would be easy to develop it at an alarming rate . We learned a lot of things while doing this. It was fun to create a game and we grasped and enhanced our knowledge a lot.

Lessons learned and recommendations for future improvements:
We learned about different python libraries. Also we applied the basic maths and physics in our program creation.
We will try to make this game multiplayer in future using secure socket programming. and also we will try to include levels, options for various difficulty levels and try to use other fields also in the game to improve it , make it interesting and more adventurous

Team Members' GitHub Accounts:
[VISHAL RAHANGDALE]: https://github.com/ElectroZoid
[SWADHA SWAROOP]: https://github.com/Rocky0204
[LAVANYA]: https://github.com/Lavanya082431

5 APPENDICES

PSEUDO CODE:

```
importing various libraries and modules

defining constants
pygame window initalisation
custom events
accessing assets for game

class projectile:
    initalisation function:
        setting projectile attributes
    draw function:
        draw projectiles for player/enemy
    handle movement function:
        if player is hit:
             place the projectile again into enemy body
             reduce player's health
        if enemy is hit:
             place the projectile back into player body
             remove the enemy from the set
        if next movement of projectile doesnt lead it outside window:
             continue movement of projectile in the direction in which it is initially moving
        else:
             place the projectile back into player/enemy body

class enemy:
    initalisation function:
        setting enemy attributes
        making an object bullet belonging to class projectile for enemy object
    draw function:
        draw the enemy cannon on the basis of player location
```

```
draw function:
    call global constants
    fill the background with an image
    draw player's projectile
    draw projectile for every enemy in the set
    draw player's tank body on basis of current angle
    draw player's tank cannon on basis of current angle depending on location of  mouse
    draw player health
    draw kill count text on top left corner

movement function:
    call global constants
    if a is pressed:
        rotate the tank body in anticlockwise sense
    if d is pressed:
        rotate the tank body in clockwise sense
    if w is pressed:
        if the next movement of tank doesnt lead it outside the window:
            move it forward along the direction in which it is facing currently
   if s is pressed:
        if the next movement of tank doesnt lead it outside the window:
            move it backward along the direction in which it is facing currently
     call player's projectile handle movement function
     call enemy's projectile handle movement function for every enemy in set
```

```
main function:
    call global constant
    creating projectile object and an enemy set
    while True:
        if health of player is greater than 0:
            if total kill>=0:
                create an enemy object
                add object to enemy set
            if total kill>=5:
                create an enemy object
                add object to enemy set
            if total kill>=10:
                create an enemy object
                add object to enemy set
           if total kill>=15:
                create an enemy object
                add object to enemy set
            if lmb is pressed:
                shoot projectile from player
            if any enemy belonging to set doesnt have active bullet on window:
                shoot bullet towards player
            accessing the keys pressed on the keyboard
            accessing mouse location
            call draw function
            call movement function
         else:
             draw game over menu with total kills at the center of window
 call main funtion
```

References

[1] https://youtu.be/jO6qQDNa2UY

[2] https://youtu.be/tJiKYMQJnYg

[3] https://www.geeksforgeeks.org/python-display-text-to-pygame-window/