
Demon's Army:
Blood War

Only the bravest will remain



The Elite Four

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Mechanics of the game

1. Try to shoot as many enemies as they appear.
2. Each kill will reward 10 points.
3. Be on your toes as the enemies will hunt you around the arena.
4. The enemies become more restless and abundant as you progress.
5. You can survive only 3 hits.
6. Have Fun!

Features



Demon's Army: Blood War

- 1 . Background And Design
- 2 . Log In Screen
- 3 . Character Selection
- 4 . Window Resolutions
- 5 . Music
- 6 . Character Movement
- 7 . Aiming
- 8 . Shooting
- 9 . Enemy Spawn
- 10 . Enemy Movement
- 11 . Enemy Variation
- 12 . Pause
- 13 . Boss Key
- 14 . Score
- 15 . Save/Load
- 16 . Cheats
- 17 . Collision Detection
- 18 . Game Over

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Description



Demon's Army : Blood War

Muhammad Ashar Naveed

Backgrounds And Design

Music Tracks and Sound Effects

Scoring Mechanism

Player Health and Game Over

Character Movement

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Game Design and Background

Finding adequate backgrounds for the game and implementing them onto the canvas within the tkinter window.

Furthermore designing the layout of the Main Menu along with button creation. Creating the graphical part of settings menu.

Music Tracks and Sound Effects

Finding and applying music tracks using the winsound module at the Main Menu and Game Over screen to intensify ambiance. Furthermore, applying a gunshot sound and a damage sound at adequate positions.

Scoring Mechanism

Created the scoring mechanism depending upon the number of enemies killed by the player. Also displaying the score using an integer variable.

Player Health and Game Over

Implementation of Game Over using the bounding box(bbox) method.

Later on, addition of a lives mechanism to give the player some room for error. Lives are represented by 3 dark red shapes(i.e. oval) which turn to white when character loses one life.

Character Movement

Developing the character framework which includes:

- Character Spawn
- Character Movement : Implementation of two separate control schemes (WASD and Arrow Keys).
- Character Bounds

Zeeshan later enhanced this function by adding animations.

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Demon's Army: Blood War

Zeeshan Memon

Animations

Aiming

Shooting

Collision and Kills

Save and Load Mechanism

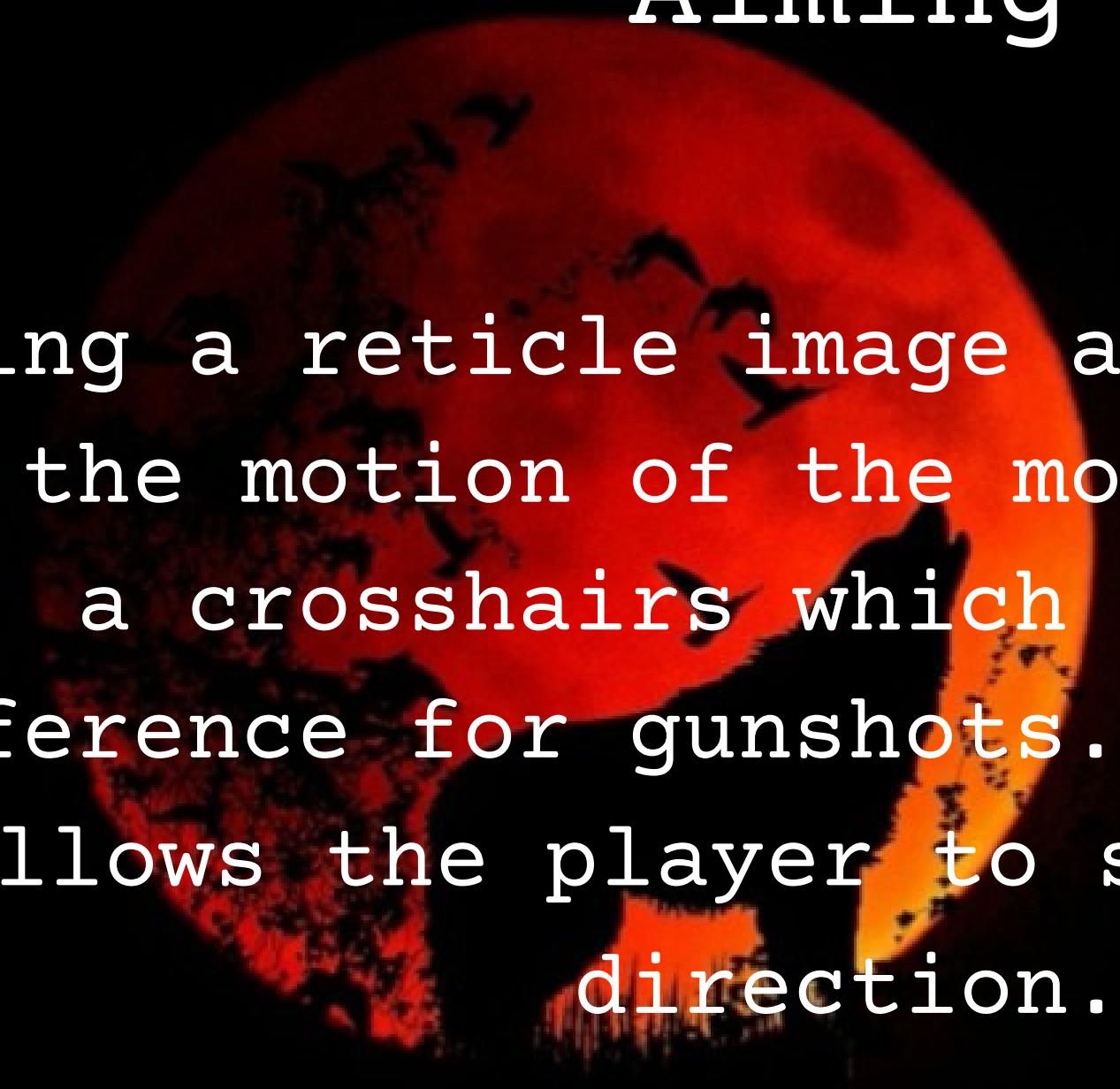
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Animations



Building upon the character framework, adding multiple character frames and alternating between them whenever a lateral movement key is pressed to create an animation.

Aiming

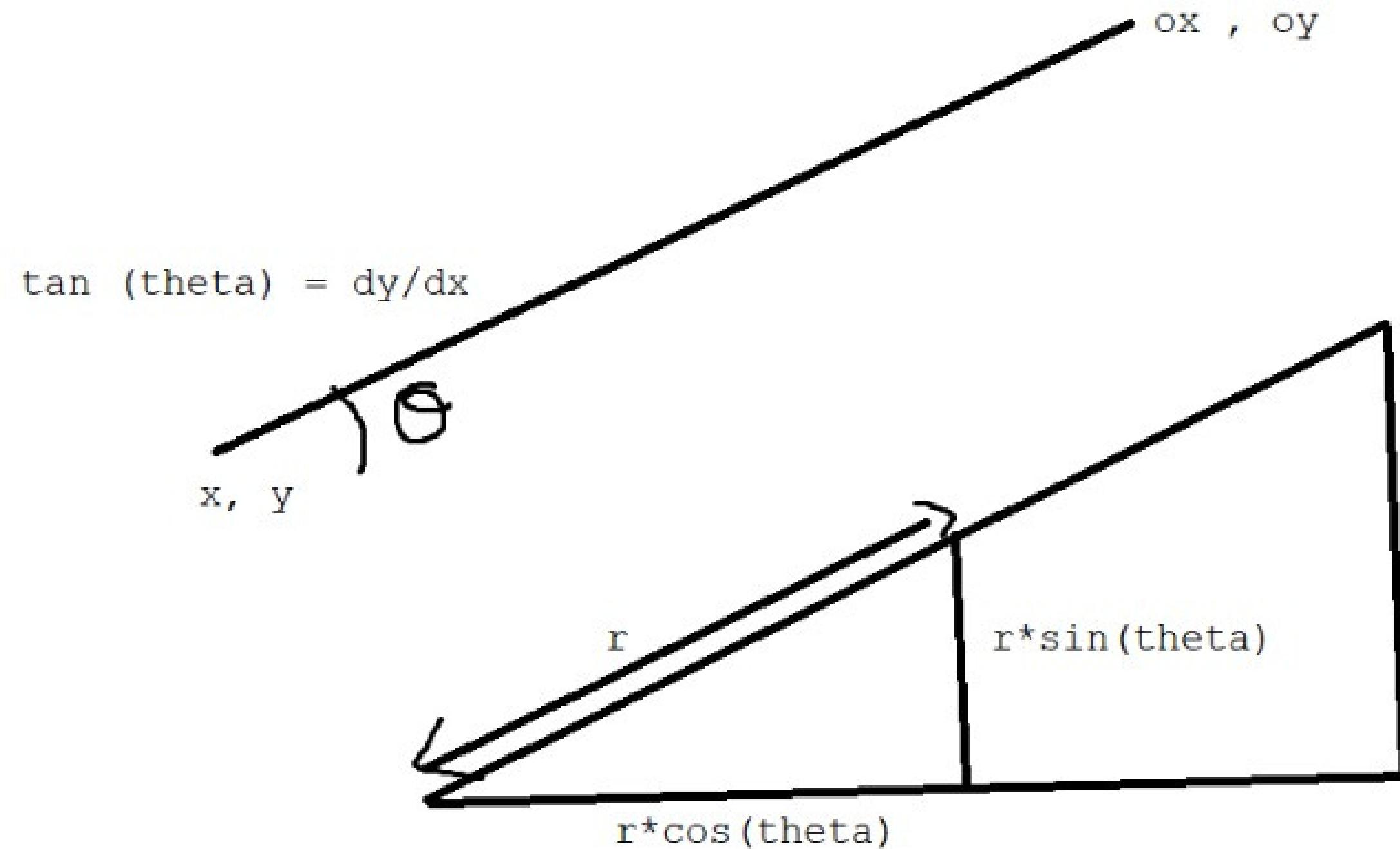


Using a reticle image and binding it to the motion of the mouse, creating a crosshairs which acts as a reference for gunshots. This feature allows the player to shoot in any direction.

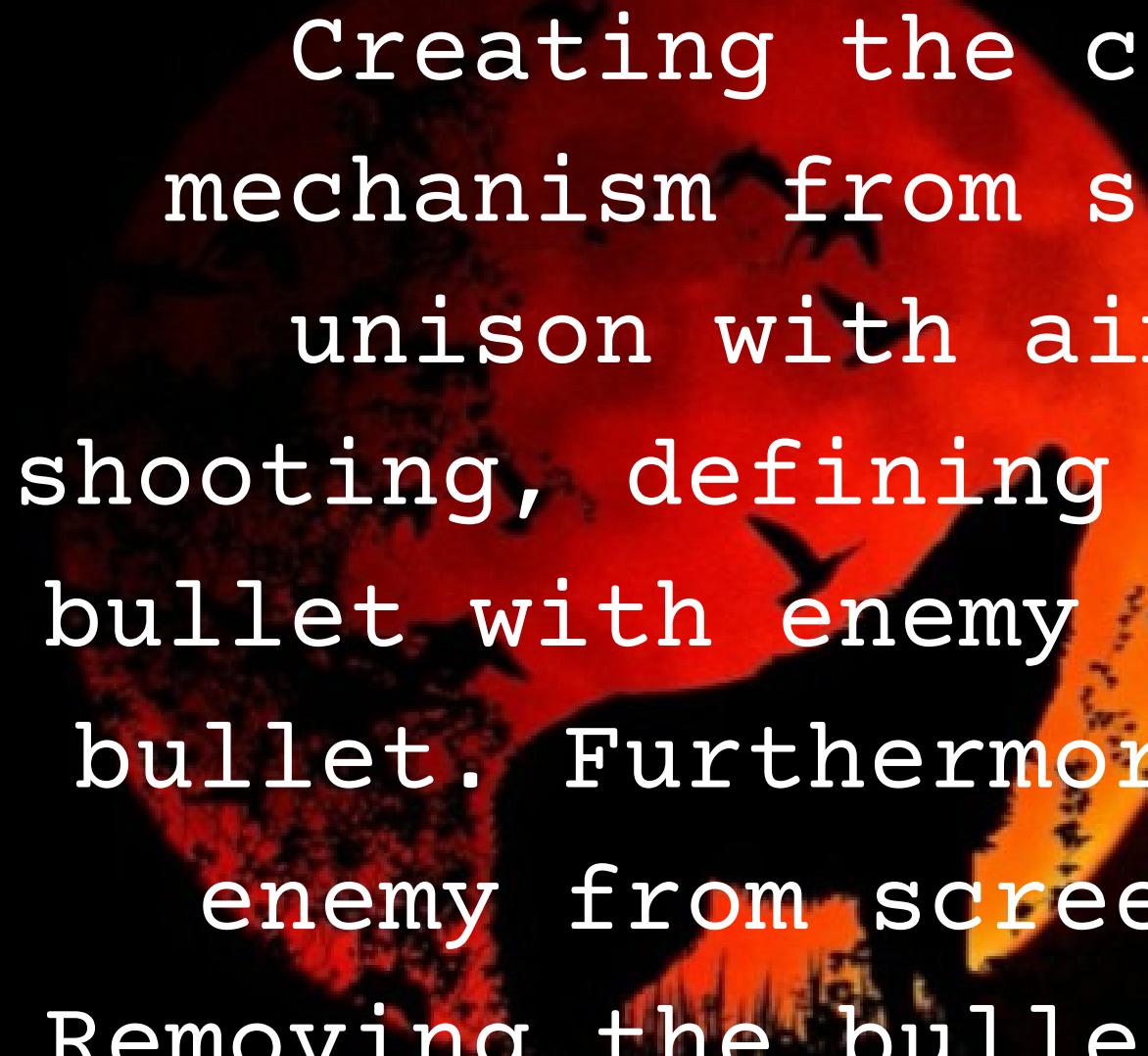
Shooting

With the aim in place, created the shooting mechanism. It had the following parts:

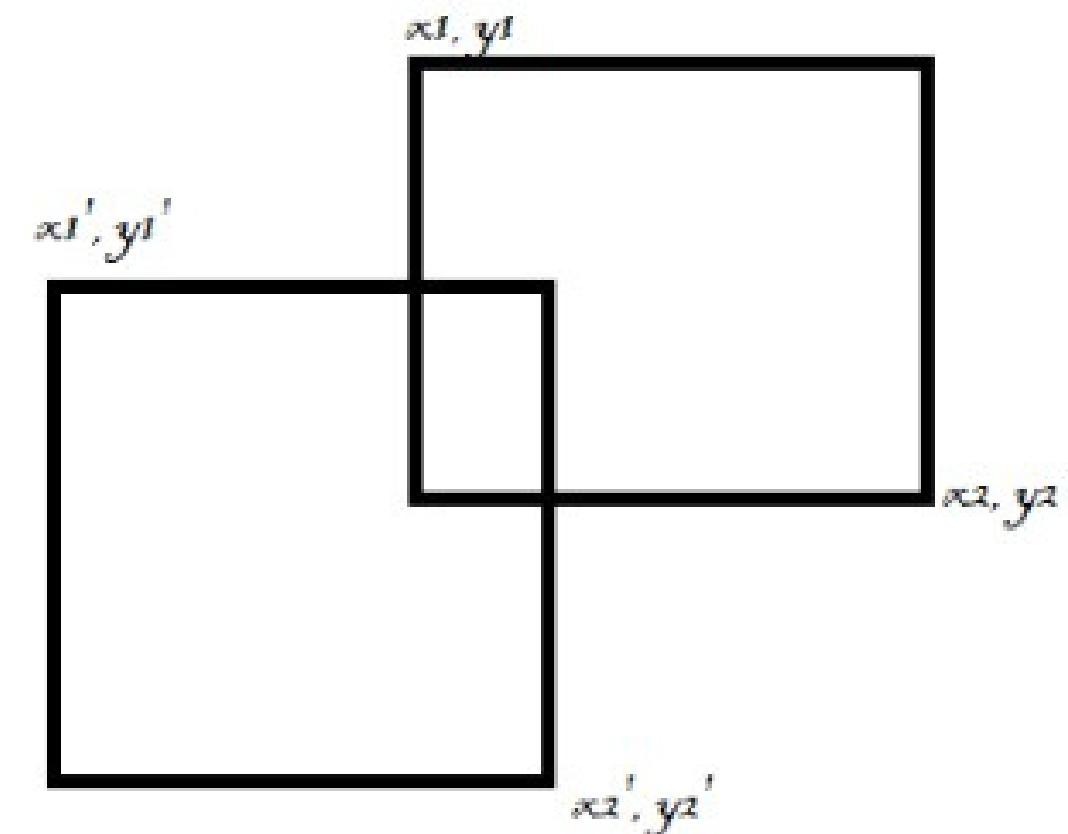
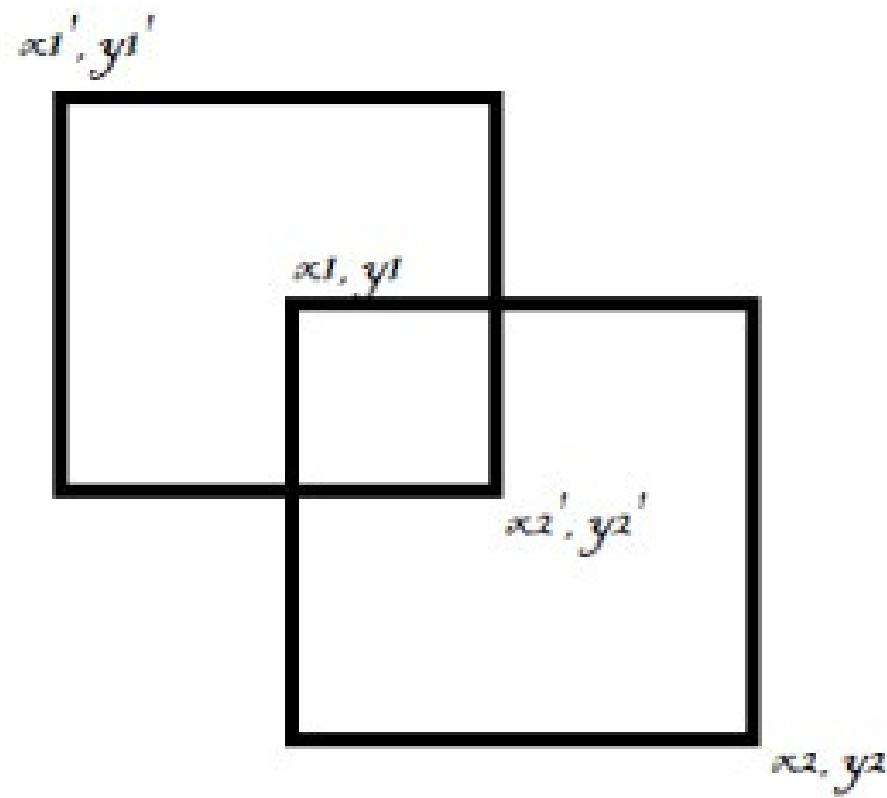
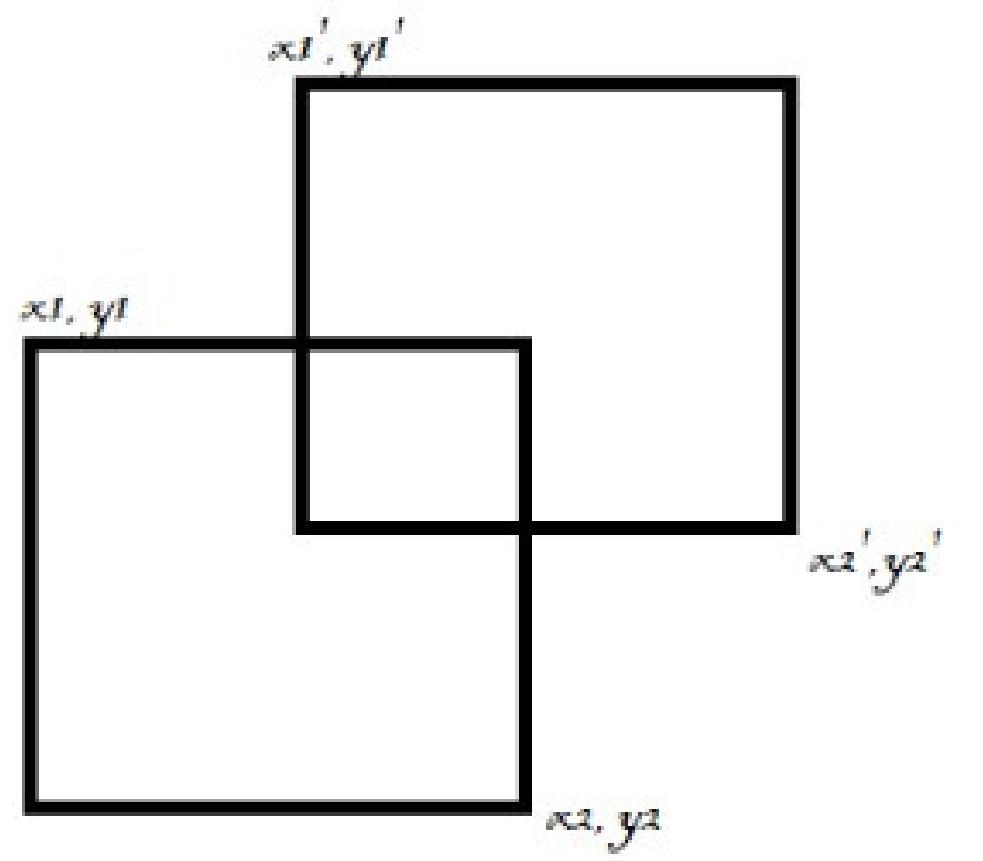
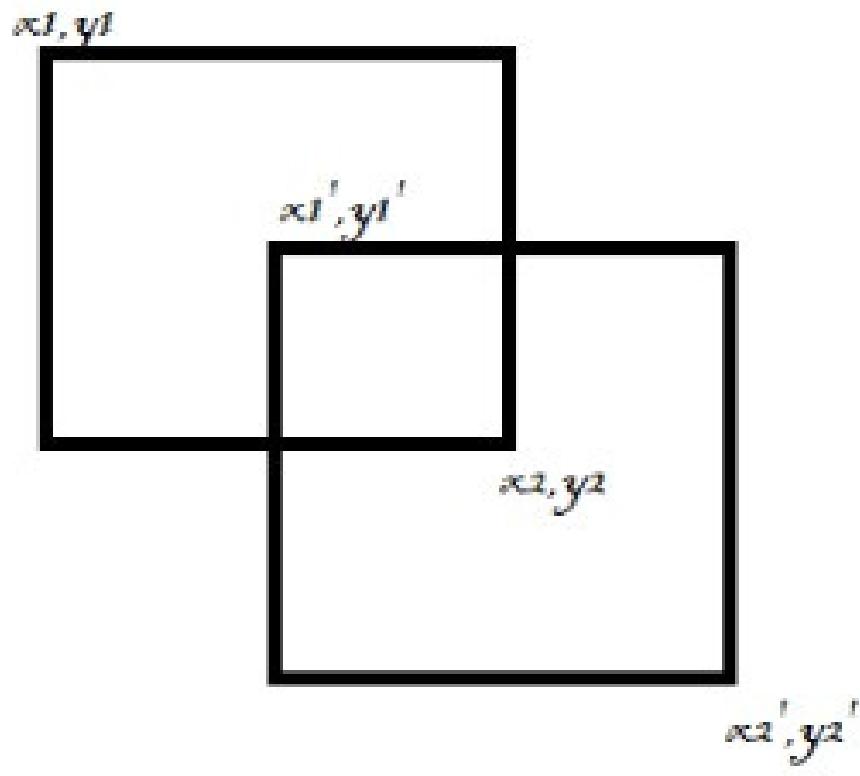
- Bullets : Creating the bullets and their speed.
- Binding : Binding left mouse click to shoot a bullet.
- Trajectory : Using trigonometric formulae to calculate the angle between the character and the click.
- Collision : Modeling the collision mechanism and dealing with misses.



Collision And Kills



Creating the collision mechanism from scratch. In unison with aiming and shooting, defining collision of bullet with enemy and range of bullet. Furthermore, removing enemy from screen if hit. Removing the bullet if it hits or even misses.



```
if (x1>=x1' and x1<=x2') or (x2>=x1' and x2 <= x2'):  
    if (y1 >= y1' and y1 <= y2') or (y2 >= y1' and y2<= y1'):
```

Save And Load

Building the save and load mechanism. It has the following features:

1. Using JSON, dumping the character co-ordinates, score, number of enemies, types of enemies and co-ordinates of enemies in a file.
2. A Guest can not save his/her game as save files are based on the name of the player.
3. If a person logs in with the same name he saved the game as, only then can he load his save file.

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Muhammad Affan Zahid

Window and Game Resolutions

Hostile Framework:

- (I) Hostile Spawn
- (II) Hostile Variation
- (III) Tracking

Cheats

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Window And Game Resolution

Designed and developed the different resolutions of the game.

It has the following features:

1. There are 3 preset resolutions from which you can choose.
2. A Drop-Down Bar has been created in the Settings Menu of the Main Menu.
3. Each widget is manually remade in accordance with the screen width and screen height.
4. All images in the game have been resized to fit within the pre-defined resolutions.

Hostile Framework

This framework is the amalgamation of various functions as all of them combine to form the behavior of the enemies. It has the following functions:

- Spawning Hostiles
- Multiple Enemies
- Enemy Movement
- Tracking

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Spawning Hostiles

- The enemies are spawned at the right side of the screen at random positions.
- Enemies can not spawn on the left side of the screen as that will be too close to the character.
- The number of enemies spawning is related to the amount of enemies killed.
- Each enemy dies from a single shot.

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Multiple Hostiles

- There is not a single type of enemy but multiple enemies
- Each enemy spawn is random from a list of 6 different enemies.
- All enemies are selected randomly by using a randint function which gives the index of the list.

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Hostile Movement

Making all enemies move towards the player.

- At first, the plan was to make the enemies move in straight lines. This was done by using the move function and just giving it a constant 'x' value
- This plan was quickly scrapped as the game became just about dodging. So, a new strategy was employed. i.e. Tracking

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Tracking

- Enemies hunt down the player around the screen.
- Instead of moving one-dimensionally, enemies move in 2 directions simultaneously.
- The basis of tracking are the rectangular components of a vector.
- Obtaining the coordinates of both character and enemy using the coords method.
- Finding the horizontal and vertical distance between them using distance formula.

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Tracking - Continued

- Now, we calculate the trajectory using trigonometry.
- Using Pythagorean Theorem to calculate the length of hypotenuse (trajectory).
- Dividing horizontal distance and vertical distance by diagonal distance. This results in us getting the sine and cosine function.
- Now, we know that the sine and cosine function are the vertical component and horizontal component of a vector respectively.
- Replace 'x' and 'y' by these values in the move method to get the enemy to always move towards the character.

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Cheats

Creating a Cheat Bar which can only be accessed in the Pause Menu. Adding the following cheats to the game.

1. speeddown : Halves the speed of the next 10 enemies.
2. scoreup : Increase your score by 100.

Eisha Fatima

Log In Screen

Character Selection

Leaderboard

Pause

Boss Key



Log In Screen

Creating the log in screen. Creating an entry box which takes the name of the player. You can also play as a guest. This function lays down the basis of two important functions:

1. Leaderboard
2. Save/Load

A Guest can have his place in the leaderboard but can not save his game.

Character Selection

Modeling the Character Selection Menu and also creating the back-end functions of character selection. Using an IntVar to give both characters a number, whichever is selected is saved in the game.

Pause

The Pause function is created by saving the character type, character position, number of enemies, position of enemies and score in variables. When the game is resumed, everything is placed in it's correct place and resumed. Upon resuming, you have a 3 second gap to get ready.

The Pause Function is the basis of :

1. The Save Option
2. Back to Main Menu
3. Cheats

BOSS Key

The BOSS Key is simply the implementation of the Pause with an added on feature of displaying a Google webpage. It is done by displaying the picture atop the game screen whenever 'b' is pressed. It pauses the game and shows the webpage.

Leaderboard

For creation of leaderboard following things were used:

- An external file called "leaderboard.txt"
- Two lists i.e scorelist and playerlist

Sorting of scorelist is done by implementing bubble sort algorithm and playerlist solves simultaneously.

Thank You

