Escape Dhruv's Maze

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Introduction:

The program we are planning to embark on is a three dimensional maze where the user is in first person and needs to find their way through the maze. This game solves the problem for people who are bored of playing 2d mazes and want to tackle a 3d maze instead. We want to do this game because we want to challenge ourselves with coding something that is three dimensional. People who would like to use our program are people that like strategy games. The game will use people's intuition and their cautiousness as the monsters will be lurking to attack the user and they would have to find the path as fast as they could.

In the maze, there will be walls where the user of the program is unable to see over. Essentially, the walls are the building blocks of the maze. There are only certain paths, one or more, that lead to the end of the maze. There are two types of walls: fixed walls and pillars. Fixed walls serve as a barrier in which the user may not cross through, they can only go through the open parts of the maze. Pillars connect the fixed walls together. There will be a timer that will calculate how long it takes for the user to reach the end of the maze. When the user completes the game, the game will show the leaderboard, which displays the completion time of the game in the order of fastest to slowest. There will also be hostile monsters along the journey which will try to decrease the player's health. In order to complete the maze, the user should knock at least 10 monsters before hitting the end of the maze, represented by a box with a finish line banner texture. On the top of the screen, the user will have a health bar that displays the remaining health, time passed, the number of coins, and the number of monsters knocked.

Throughout the maze, hostile monsters will attack the user when they are in range of the user, which deals some damage. The user can either try to run away from all the monsters, or the user can attack the monsters with a power up (a weapon) that they can buy from coins. There are two types of weapons, a blaster and a sword. Both weapons have infinite uses, however the sword is a short range weapon while the blaster is a long range weapon. The sword deals less damage but has a shorter attack cool time while the blaster deals more damage but has a longer attack cool time. There are also two different types of monsters, represented by the image and the size. The bigger monster has a higher health and damage but its speed is slower and the smaller monster has a lower health and damage but its speed is faster. All monsters will move around the maze and will chase the user. The user initially has a given, fixed amount of health (100 health), and they can be lost if they get hit by a monster's attack. For every 5 seconds, the player naturally heals by a small amount. There are also stores throughout the maze, which is represented by an image box. In the store, the user will be able to either buy weapons or power ups that will be applied to the game that uses their coins. The most recent weapon is what the player uses. Purchased items will go to the user's inventory. Weapons can help the user get rid of the monsters, and power ups include special abilities, such as healing, and faster movement speed.

Instructions:
At the beginning of running the program, there will be a start screen prompting the user to start the game, access the menu, or access the leaderboard. (S - start game, M - menu, L - leaderboard)

Once the game starts, users move around with WASD keys and can move vertically up and down with space/alt.
W - Move Forward
A - Move Left
S - Move Backwards
D - Move Right
Space - Vertically up
Alt - Vertically down

The player will only have an option to enter the store menu when the player enters a store box in the maze and the player can enter the store menu using the keyboard 'T' button. The mouse left key will be used to shoot the attack if they have a blaster(won't do anything if no weapon). If they have a sword, they would hold it out in front of the monster
There will also be coins throughout the maze that the user can go through, and the user can use those coins in the store to buy things.
The things that the user could buy are the ability to move faster, weapons (blaster and sword), and healing. These upgrades only last for one game and go away when a new game is started.

Features List (THE ONLY SECTION THAT CANNOT CHANGE LATER):
Must-have Features:

- Monsters that appear in the maze that the user has to avoid. The monsters will move towards the player's location and will try to attack the player when they are in range.
- Power ups which are in the store which the user could buy. Power ups include the ability to move faster, heal, and weapons (described below).
- The actual 3D-maze with multiple solutions to go through the maze. The maze will include walls, which the user cannot go through, and also pillars which join the walls together.
- Coins will also appear in the maze which the user can collect in order to buy power ups which are in the store menu.
- A timer will also be present on the screen which will track the amount of time that the user takes to complete the maze.
- Weapons will also be there for the user to buy as a power up. Weapons can include a blaster and a sword. The sword has half block range, infinite uses in the game, and deals 30 damage to monsters. The blaster has unlimited shots, has a 4 block wall shot range, and deals 50 damage.
- A person, which is a camera (first point of view game), that represents the user going through a maze and potentially holding a weapon.
- UI with all the different screens, health bar of person, number of coins player has, etc.

Want-to-have Features:

- A blocker is a moving entity that is around the maze. Player or any other entity cannot go past a blocker. Blocker has an extremely high health, so the player should use a power up to go past it.
- A leaderboard records the time whenever the user completes the maze. It displays the records depending on how fast the record is.
- Audio files for the different entities and things that happen in the game. Music plays throughout the game and the different screens with the store and start menu. The audio would change when a monster is in attack mode and fighting with the user. There would also be audio for the collecting of coins.
- Different types of monsters will have different amounts of health, and attack the user in different ways.
- Multiplayer gamemode will allow multiple users to either work together to escape the maze, or compete with each other.

Stretch Features:

- Having different levels of difficulty for the maze. There would be an easy, medium, and hard mode. This would change the dimensions of the cube and also change the amount of pathways possible while also increasing the amount of monsters and other entities.
- Higher level difficulty for monsters would make it harder to either fight and/or escape from them. They would have a higher range of spotting you and chase you for longer. They would be faster and harder to fight with more health.
- Password feature that allows the user to save their progress when they exit the game. This would keep their high score and all the coins they had collected throughout all the games they had played.

Class List:

- Entity >> abstract class
    - Coin >> extends from Entity
    - Monster >> extends from Entity
    - Interactable >> extends from Entity
- Screen >> abstract class
    - StartMenu >> extends from screen
    - Store >> extends from screen
    - Menu >> extends from Screen
    - UpgradeInfo >> extends from Screen
    - GameScreen >> extends from Screen
    - GameEndScreen >> extends from Screen
- DrawingSurface >> extends from PApplet
- Main
- Maze
- Ammo

- Weapon >> abstract class
    - Sword >> extends from Weapon
    - Blaster >> extends from Weapon
- Wall >> abstract class
    - Pillar >> extends from Wall
    - FixedWall >> extends from Wall
- Camera
    - Player >> extends from Camera

Credits:

Internal

- Yujun Lee: Maze, Wall and all subclasses, GameScreen, Interactable
- Dhruv Solanki: Entity, Coin, Monster, Player, Camera
- Ohm Bhakta: Screens, DrawingSurface, Weapons and all subclasses, Ammo

External

- banannablaster.png, coin.png, finish.png, store.png, sword.png (from Google)
- dhruvmogging.png, mugshotdhruv.png, starringdhruv.png, sworddhruv.png (own images)
- natives folder(to run 3d graphics), anoman obong(opentype custom font), processing