CMPT 276 GROUP 11

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Game Title: Pizza Time
A game by 11 boys studio

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1.1 THE PROJECT

1.1.1 Project Information

A. This project will be for CMPT 276 for FALL 2021.

B. The project will consist of a game fully developed and implemented through java.

1.2.1 Project Scope/Goals

A. By the end of the semester the goal of the project is to have a fully working program that will be customized to our specifications.

B. The goal is to be implementing the iteration of the game as the weeks go by to have a fully working game by the end of november/ start of december.

1.1.3 Division of Activities

TBA~

1.2 THE GAME

1.2.1 **Game title:**

- Pizza Time™

1.2.2 **Game Description:**

- The game is a modified version of Pac-Man(1980) with a customized UI design and additional gameplay features.

1.2.3 **Game Objectives:**

- The player will control a car, the objective of the game is to deliver pizzas around the game map. The player wins as soon as he drops the pizza off in all the N houses.

- The barriers on the map will be disconnected roads, meaning the player can not travel between cells since there is no road.

- The player will go around the map collecting pizzas from the source restaurant and taking them to specific locations. Once a pizza is picked up, a delivery point will spawn and the player must deliver it within a time limit.

- There will be a police car that will try to stop the player. The police car will move whenever the player moves.

- The map will be made with nodes and vertices as the cells. We plan to make a NxN map. The map will be randomly generated, and each map will always be fully connected. We plan on using some sort of search algorithm to make sure each map will be connected. Nodes will be houses and vertices will be roads. Each time the map is generated some roads will not be created but there will always be the same amount of nodes/houses.

- The player will control a car and will start with 3 health. The only thing that will reduce the health of the player is the punishment, running into the police car will end the game. The player will spawn at least N cells away from the police car. (note N cell must not be at Car Character Cell and N > 10 cell radius from start node)

- The police car will use a greedy algorithm on each tick to find the shortest path between it and the player. It will move towards the first node on that path. Each time the player moves, the police car will search and move. This continues until the player finishes all the deliveries, loses all its health, or is caught by the police car.

- There will be 5 different difficulties, each time the difficulty is increased the number of deliveries required to complete the game gets increased by n.

- 3 Types of Collectibles will be added to the game: Regular Rewards, Special Rewards, and Punishments (Bad rewards).

- Pizzas are picked up from the Restaurant (starting node 0:0) and will then start a timer.

- Timer will give the Player n ticks and every NWES move is a -1 tick.

1.2.4 **Rewards:**

1.2.4.1 Regular Rewards

- When the pizza is collected the player is given a regular reward, this includes a basic improvement and added time on the player's total timer.
- Once the first pizza node is picked up the delivery location node will spawn and a timer will start.
- If the pizza is delivered within the countdown, the player will receive cash in dollars, total cash will be computed as the final score of the player.

1.2.4.2 Special Rewards

- There will be special rewards that will grant the player with power ups to make the gameplay easier.
- The special reward pops up in n ticks and disappears in m ticks.
- There will be three kinds of special rewards.
- The three special rewards are the following:
    - **Wrench -** will allow the player to gain 1 health
    - **Clock -** will stop the police as well as the countdown for delivering pizza for a given time
    - **Shield -** will grant the player with temporary invincibility from police and negative rewards. Note: it will not protect from penalties

for late deliveries and it will break after running into police or a negative reward.

1.2.4.2 Negative Rewards

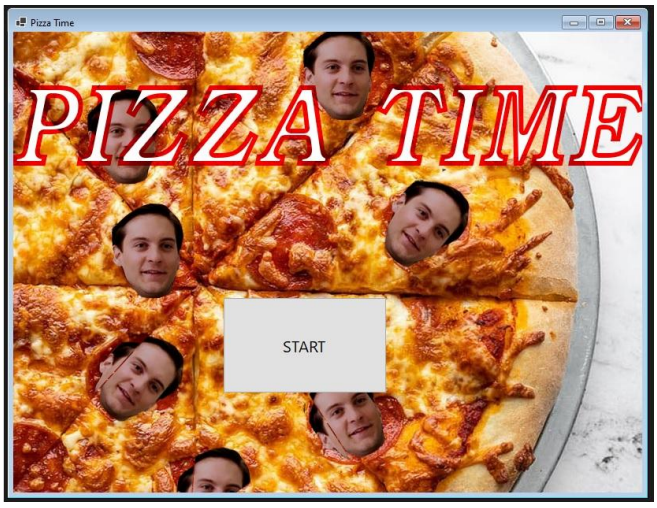
- Negative rewards are rewards that end the game, do damage or slow down the player.
- There will be three Negative Rewards in the game.
- The negative rewards are the following:
    - **Spike Strip**- will reduce the health of the player by 1.
    - **Speed Bump** - will temporarily stop the car n ticks.
    - **Walking Man** - very rare ticks there will be a walking man that if the player hits the game will automatically end and will send the person to a splash screen of “you are going to jail”.

1.2.5 **How to Play:**

- Once spawned the player will make their way to collect a pizza.
    - There is a running timer, so the player must collect the pizza.
    - After picking the pizza up, time will be added to the timer.
- The player must deliver the pizza within that time, after picking the pizza up.
- If delivered on time a player will gain score and 1 health.
- At the same time the player is spawned, a police car will spawn N cells away from the player.
    - If caught by the police car the game is over.
    - The player must avoid the police car while delivering and collecting pizzas.
- If they do not, they will lose a life and will not gain any extra score and a new pizza will spawn and the player will repeat the previous steps.
- There will be different difficulties, each will determine how many pizzas a player will have to deliver to finish the game.
    - Higher difficulties will give the player less time and more deliveries.

1.3 UI LAYOUT SAMPLE

Intro:



LEVEL SAMPLE:

WINNING SCREEN SAMPLE:

1.4 Programming Technicals

1.4.1 Use Cases

1. **Game Objectives**

Use Case: Deliver Pizza

Actor: Gamer/User

Basic Flow: Player will be moving around the map going from the restaurant location to n locations. Player will have to deliver pizza within countdown timer. Once delivered the player will gain score and 1 health

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Use Case: Fail to Deliver Pizza

Actor: Gamer/User

Basic Flow: Player will be moving around the map going from the restaurant location to n locations. Player will have to deliver pizza within the countdown timer. If player fails to deliver within the countdown timer, player will lose a life and not gain extra score.

Should we add incentive for delivering pizza after timer runs out? Maybe more punishment the later the pizza is delivered. Like -10 points for every tick or something

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Use Case: Deliver all pizzas

Actor: Gamer/User

Basic Flow: Depending on the difficulty, the player will have to deliver n pizzas to different locations. Upon delivering n pizzas successfully, the game will end, and the player will win and see their final score.

2. **Descriptions (layout, UI design)**

Use Case: Get Map

Actor: Main

Basic Flow: Main method will load an object map according to the player's corresponding level. KeyID in this case will be the identifier for the map creation.

If the player starts the game the level will be 1. keyID =1.

Alternative Flow: special easter egg map if the user presses the car logo in the middle of the start screen 20 times in a row.

Use Case: Get Characters

Actor: Main Method

Basic Flow: Main method will load an object delivery cars, enemy cars, and rewards onto the map vector.

Conditions: when placing object delivery cars, enemy cars, and reward nodes

-placeCharacter(Map (I,j)),

-placeEnemy(Map (I,k)),

-placeRewards(Map (n,m)), is loaded in the vector[a,b] Map where (I,j) != (I,k) != (n,m)

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3. **Technical gameplay**

Use Case: Start Main

Actor: Gamer/User

Basic Flow: User presses start on the game and the game loads with a car loaded on a map vector. The user will have 3 lives to begin with and the game will end as soon as lives = 0.

Use Case: Moving around the game.

Actor: Gamer/User

Basic Flow: Each level will iterate more destinations at a rate of n + 1. The player can move up, down, right, left around the board. The board will have boundaries depending on their level. It will become more complex (maze like).

Use Case: Player runs into the police enemy

Actor: Gamer/User

Basic Flow: While moving on the map, the player can run into the police. If the player runs into police, the game will end, and a busted screen will pop up.

Use Case: Player Loses All Health

Actor: Gamer/User

Basic Flow: While moving on the map, the player can lose all their life. If the player's health goes to zero by failing to deliver pizzas on time or by running into a spike strip the game will end and a broken car will pop up.

Use Case: Getting Wrench Reward

Actor: Gamer/User

Basic Flow: While moving around the map, the player moves over the wrench reward. Once moved over, player health increases by 1 and the wrench disappears.

Use Case: Getting Clock Reward

Actor: Gamer/User

Basic Flow: While moving around the map, the player moves over the clock reward. Once moved over, ‘time stops' and the police car will stop moving and the countdown for the delivery will also stop for a short period and the clock will disappear.

Use Case: Getting Shield Reward

Actor: Gamer/User

Basic Flow: While moving around the map, the player moves over the shield reward. Once moved over, the shield icon disappears and the player is granted temporary immunity from negative rewards and police enemy. Although immune from direct attacks, the player is not immune from losing health for not delivering the pizza on time.

Use Case: Getting Spike Strip Reward

Actor: Gamer/User

Basic Flow: While moving around the map, the player moves over the spike strip reward. Once moved over, player health decreases by 1 and the spike strip disappears. If the player has no health after this happens, the game ends.

Use Case: Getting Speed Bump Reward

Actor: Gamer/User

Basic Flow: While moving around the map, the player moves over the speed bump reward. Once moved over, the speed bump disappears and the player is temporarily unable to move. If the countdown reaches zero or the police catch the player, the game ends.