

Runtime Terror GDD

“Street Food”

Team Members

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Important Links

1. [WebGL](#)
2. [GitHub](#)
3. [Three Interesting Analytics Insights](#)
4. [Final Video](#)

Analytics Resources

[Wins & Deaths](#)

[Questions](#)

[Levels](#)

Coins - [Sheet](#), [Visualization](#)

Related Documents

[Prototypes](#)

[Game Idea Brainstorm](#)

List of Tutorials Used

<https://www.youtube.com/watch?v=RsgjYqLID-U>

<https://www.youtube.com/watch?v=-GWjA6dxV4&t=184s>

https://www.youtube.com/watch?v=2_V0ZuB2eA

https://www.youtube.com/watch?v=517eJql_zd4&t=9s&ab_channel=JamesBrady

<https://www.youtube.com/watch?v=8Xx6ghSk668>

https://www.youtube.com/watch?v=XZnmMGz_VyU

<https://www.youtube.com/watch?v=0QA2O7juuWQ>

<https://www.youtube.com/watch?v=1saf4ahn-ek>

Game Overview

Game Concept

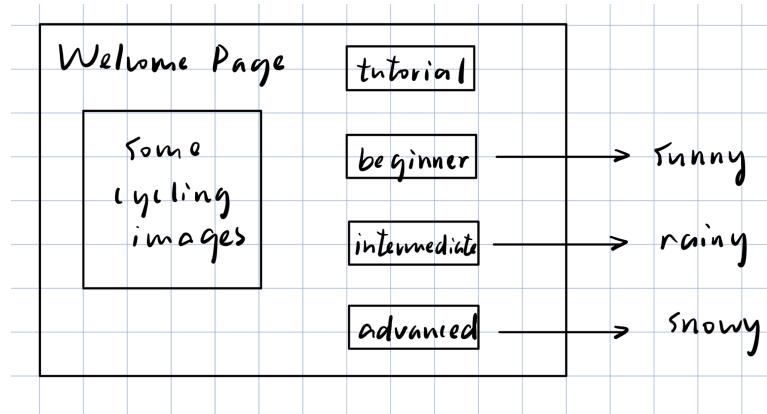
Street Food is a 3D game where the player has to collect ingredients to cook food.

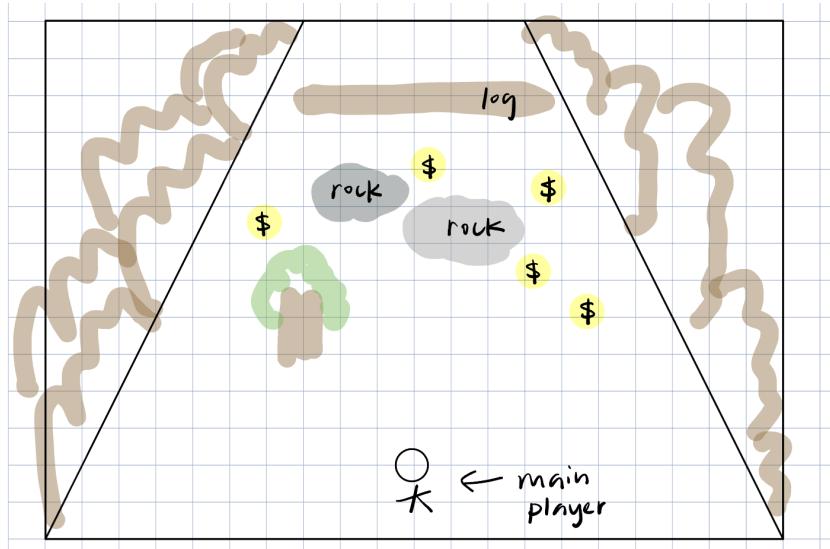
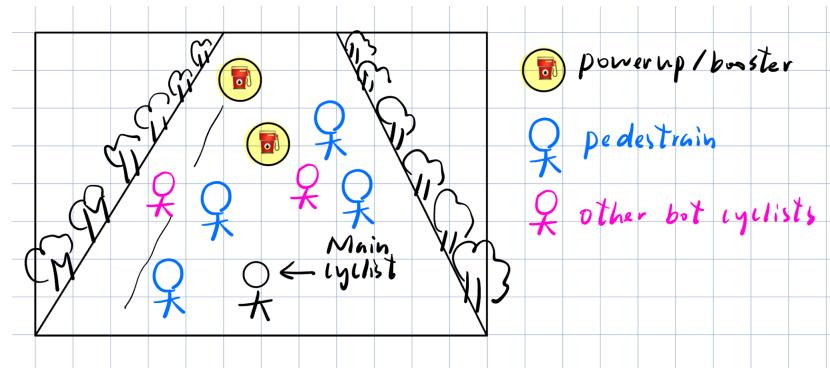
Gameplay

The player begins running on a path. There are obstacles they can dodge or jump over. If the player touches an obstacle, they will lose one heart. There are also ingredients on the path the player is running on. The player has a bag of size 3 - the bag gets updated as the player keeps collecting ingredients with the oldest item being replaced by the newest item. Once the player has the complete set of required ingredients, the player will be able to enter a cooking station (sanctum), which consists of a trivia question. If the player gets the answer right, they will be able to cook the dish. The level ends when the player has cooked the required number of dishes.

Game Progression

Initial Brainstorm





3D - infinite run

\$ - booster, gain points

rocks, trees, logs are obstacles

control: ↑ ← →
W A D

Design 1.0

Tutorial

Who are you and what are your skills?



Space

What will you do in the game?

- Collect coins to use in the Sanctum
- Cross a designated block to enter the Sanctum
- Answer a question in the Sanctum, if correct, get an ingredient, if wrong, either pay certain amount of coins to redo the question or give up and go back to the main dimension
- Collect all ingredient needed to pass this level

OK



go back to main menu

Bag
Remaining: 5
Spales

this quantity will dynamically change, get one more item, the available spaces decreases, drop one more item the

Collected:
x 2
x 2

this is a counter to count whatever has been collected so far, display the total quantity corresponding to different categories,

win scenario:
goal achieved
&&
collected total <= bag size
&&
finish line reached

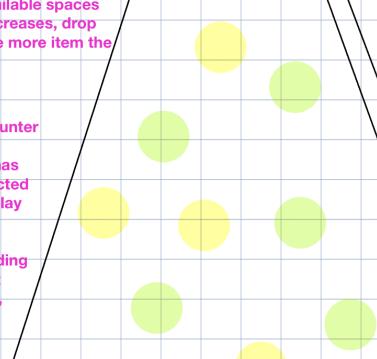
lose scenario:
collected total > bag size
||
(finish line achieved
&&
goal not reached)

Goal: x 3

Distance : 25
Remaining

since the runway length is fixed, distance remaining gives the player an idea of how much more they are

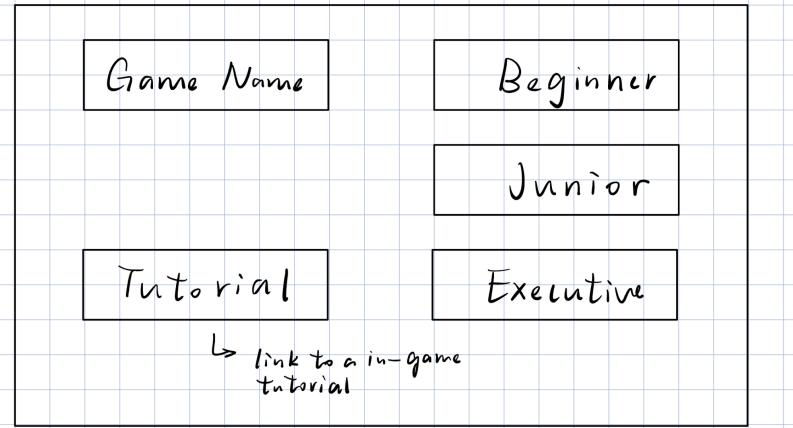
fixed length



destination

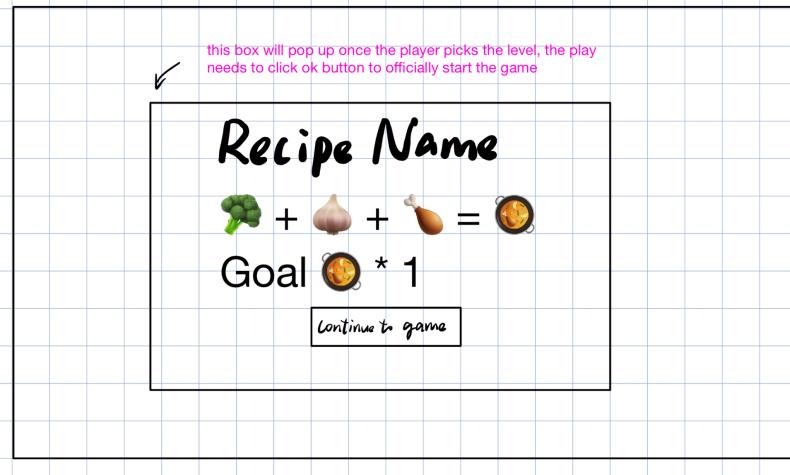
this will later serve as the recipe of the food, displaying

Welcome Screen

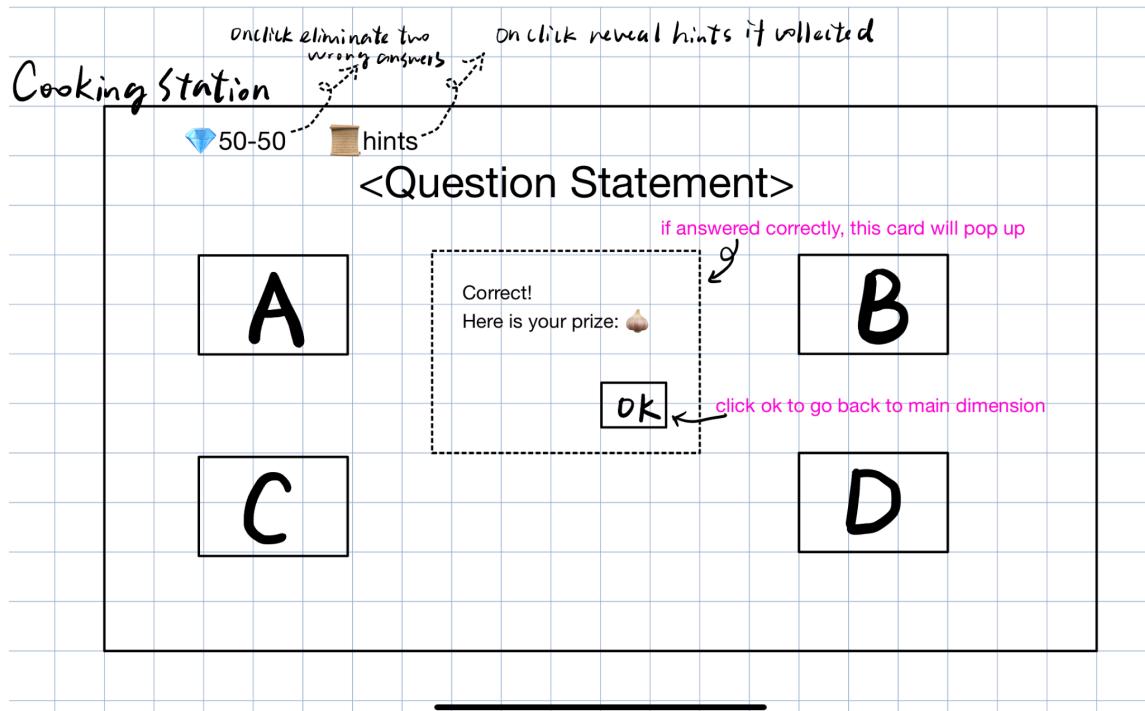


When the player clicks “Tutorial”, they will be directed to an in-game tutorial. They can also click the level (Beginner/Junior/Executive) to start the game directly.

Main Play
after the player picks the level, game starts:



When the player clicks on a level, they are shown what the recipe is. The player has to collect ingredients on their running path. The player has to collect a complete set for that recipe before entering into any cooking station. The player has to cook the food in the cooking station and earn the corresponding reward.

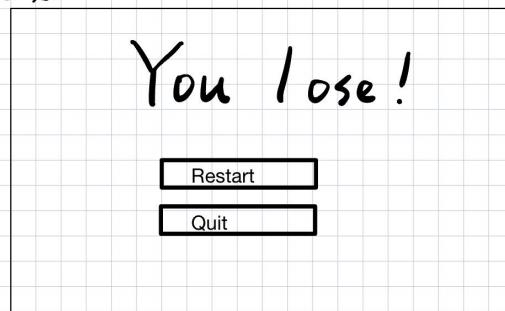


Once entering the sanctum, the player is able to use power-ups such as 50-50 or hints to help them answer the questions. If the player answers the question correctly, then they will cook the food successfully. If the player answers the question wrong, no dish will be cooked.

Finish Screen:
Win:



Lose:



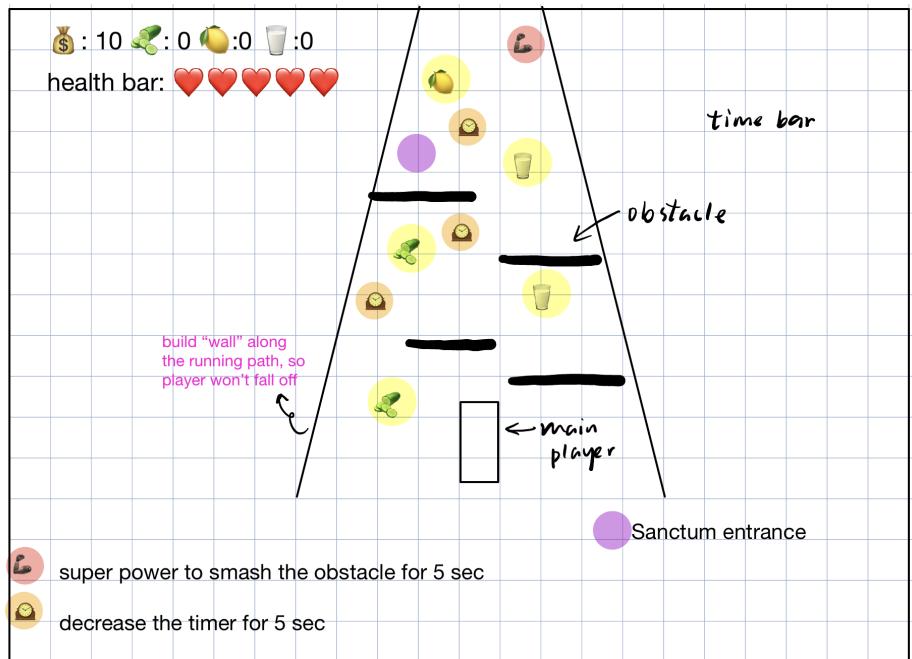
The player completes a level successfully when:

1. They have earned the required quantity of dishes as shown on the recipe screen
2. AND time has not run out

The game is over when:

1. The time runs out
2. OR the player has lost all lives

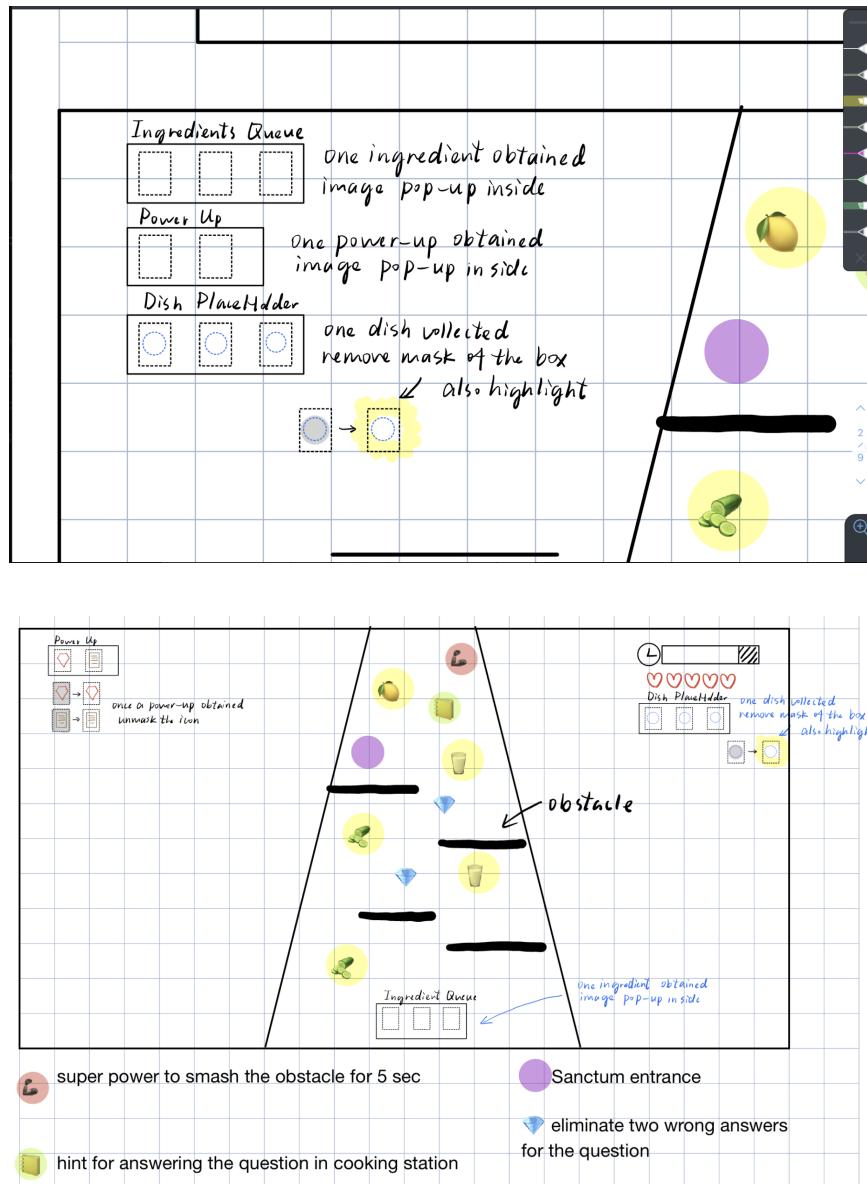
Design 2.0



Modification:

1. Use image sprites to represent ingredients instead of text
2. Add positive and negative power-up for player to play game more intuitively
3. Add health bar to show the current lives for player

Design 3.0 (Final Design)



Modification:

1. Add spirits and bag box to substitute the text
2. Add animation to notify whether collecting enough ingredient to the cooking station or losing life
3. Add different animation to differentiate the power-ups and ingredients

Planned Game Design

Design Feature	Level1	Level2	Level3
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Dish	Tzatziki sauce: cucumber + yogurt + lemon	Tomato basil soup: basil + onion + tomato	Grilled kabob: steak + pepper + mushroom
Time Limit	90s	120s	180s
Goal	1 plate	2 plates	3 plates
Powerups	Hints + 50-50	Hints + 50-50 + Hammer	Hints + 50-50 + Hammer
Obstacles Category	Stationary trash can	Stationary trash can + Moving obstacles (mouse)	Stationary trash can + Moving obstacles (mouse)

Mechanics

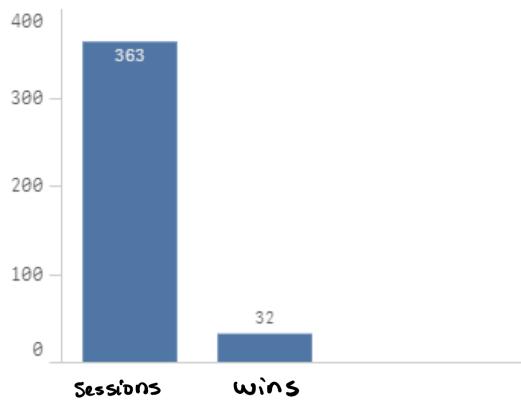
The player moves forward with a constant speed. They can only be controlled by the left arrow key to move left, right arrow key to move right, and space to jump over obstacles. When the player has enough balance, any ingredients players touch along the running path will be collected. When the player has at least one complete set of ingredients (according to the recipe), the bag will be highlighted in green, they will enter the cooking station where they will have to click on trivia questions to answer them and cook a dish. There are also power-ups along the way to help the player succeed in the game.

Analytics

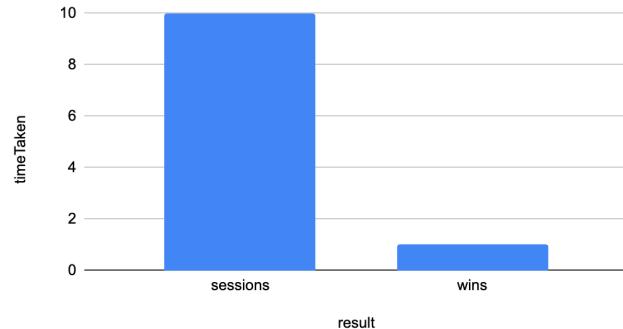
Graphs

Sessions and Wins

Sessions and wins



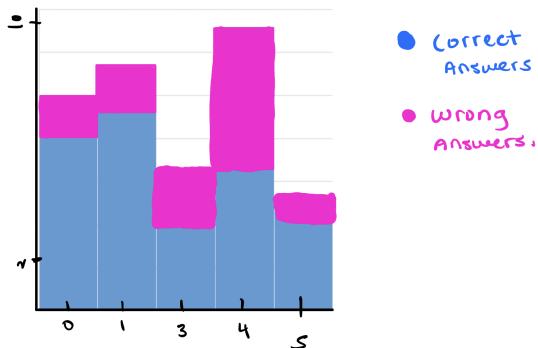
Sessions and Wins



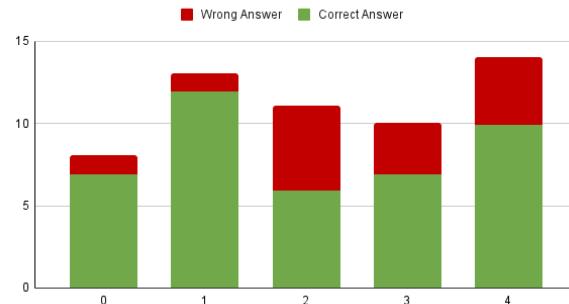
The graph above will help us understand the overall difficulty of our game. It will indicate how achievable winning in our game will be. We can make changes accordingly. It will give us a hint if the game is working properly as well.

Questions vs. Submitted Answers

Question index vs. Submitted Answers.

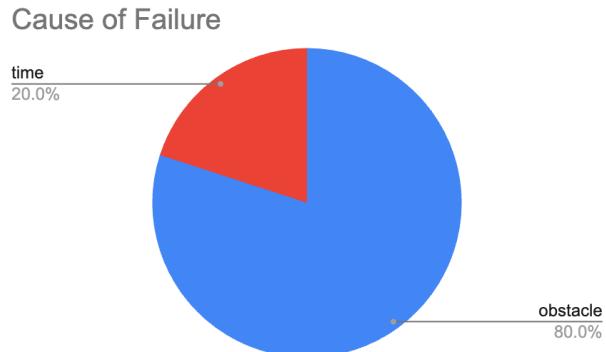
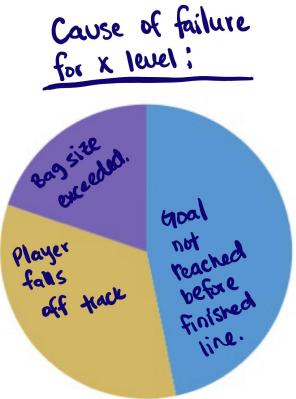


Question Index vs Submitted Answers



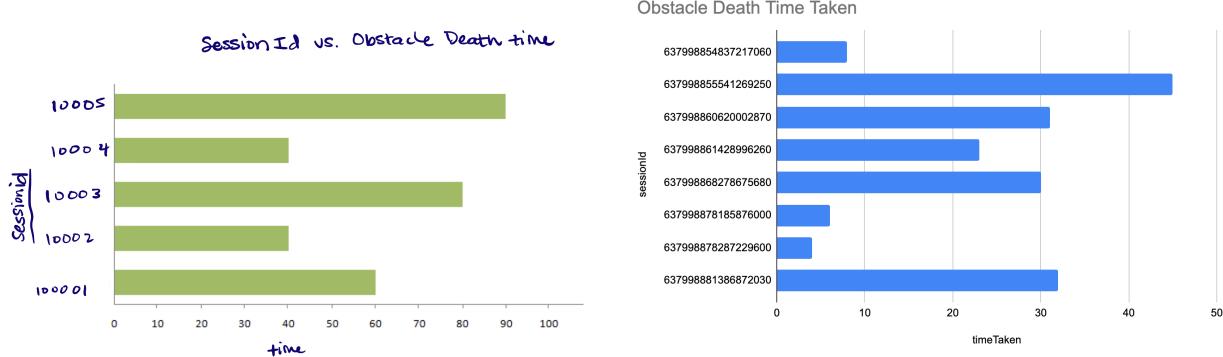
Observing the question index vs submitted answers will help us understand the questions being asked in the sanctum. Specifically looking at the difficulty per question. This can help us reorganize/reconsider some of the questions being asked in the sanctum.

Cause of Failure



Our pie chart will indicate what might need some possible adjustments. If the majority of the players are dying due to the obstacles we can fix the frequency of obstacles thrown at a player. If players are running out of time, more time can be provided so more players are able to complete a certain level.

Obstacle Death Time Taken



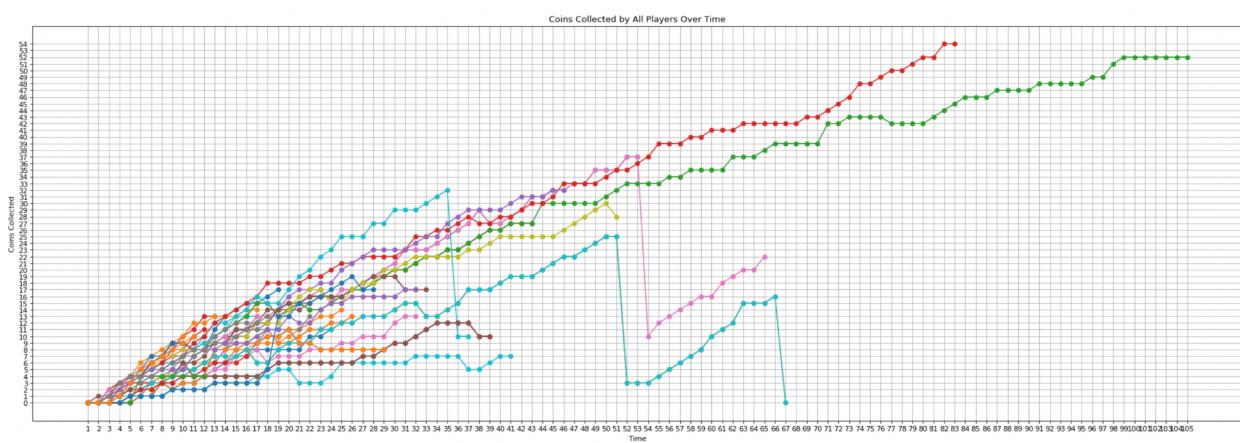
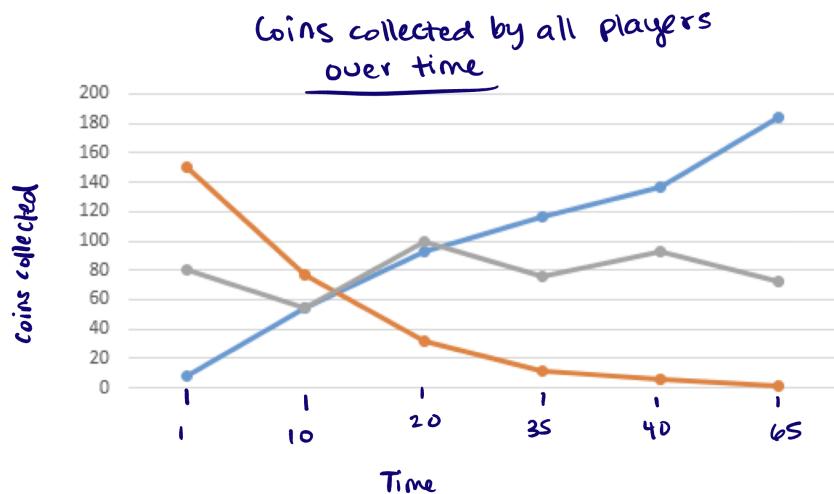
Observing the time it takes a player to die from an obstacle within the game will be great to understand if we are placing too many obstacles at the beginning, and how long it takes a player to die because of hitting an obstacle.

Completion Rate by Level



Observing the rate of completion by level can help us to determine if a level is too hard due to the speed of the player, obstacle counts, time limit, or difficulty of questions.

Coins Collected Over Time



Each of the lines above is for a particular play session. This graph will help us understand how players are collecting coins and using them. If the line stays horizontal for a long time, that means the player is moving along without collecting coins. If the line keeps going up without falling down, that means the player is not entering the ingredient sanctum. A large drop indicates that the player retried questions in the sanctum. Overall, this graph will provide insights into the decisions the player is making.

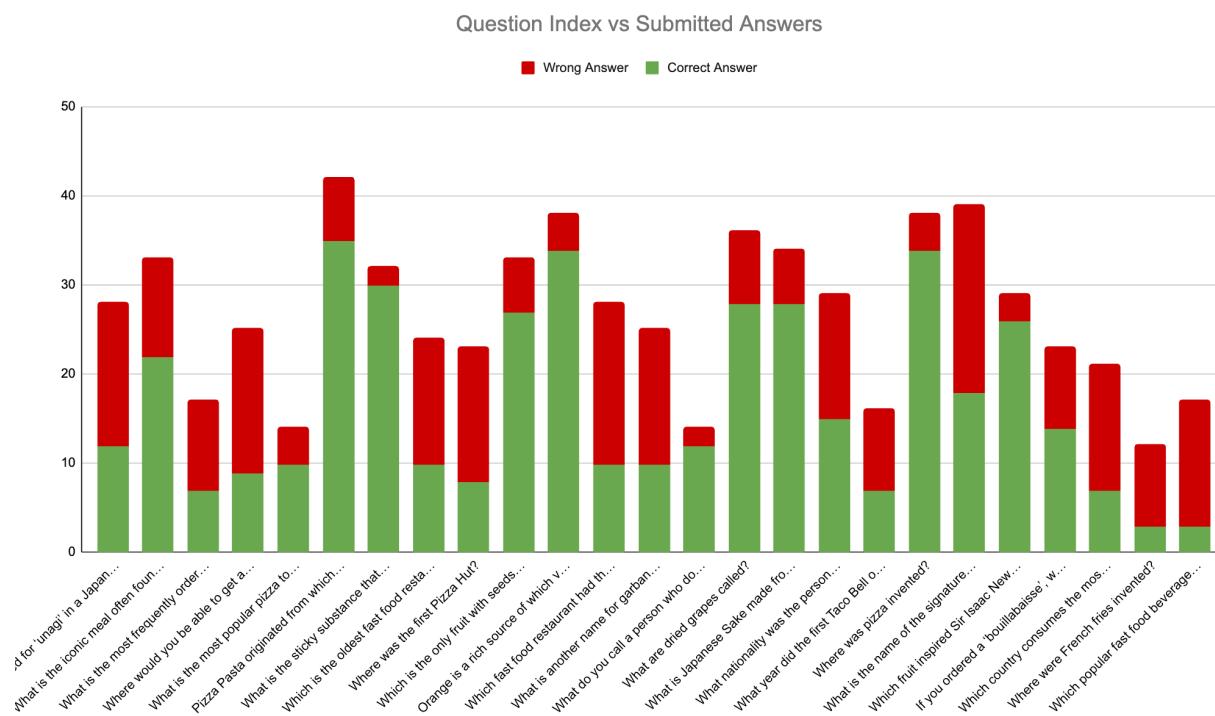
Methodology

To collect the analytics data, we have created a Google Form with fields for the information we are tracking. We are using a Session ID (Timestamp) to track unique plays of the game. In Unity, we have added code to make a POST request to the Google Form with the data. The POST request is made when the player wins or dies. We have followed the Analytics Methodology Example 5 shared in the class. Additionally, for the “Coins collected over time” graph, we have written Python code in Google Colab to generate a graph from the Google Form data.

Analytics & Feedback

Mid-term Analytics

Question Difficulty Analysis Graph

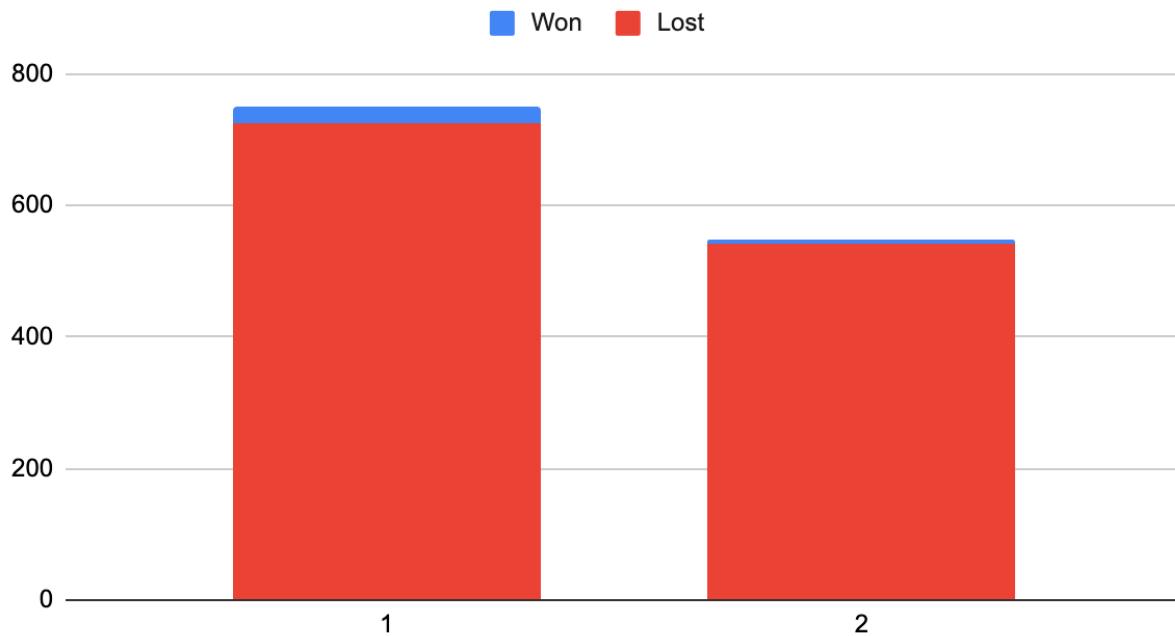


We can see that the questions that are related to historical facts (years) or related to very specific fast-food chains, are the ones that the players got wrong. Questions related to popular, daily items such as pizza, dried grapes, or honey are gotten right most of the time.

Level Analysis Graph

Level	Lost	Won
1	726	25
2	542	6

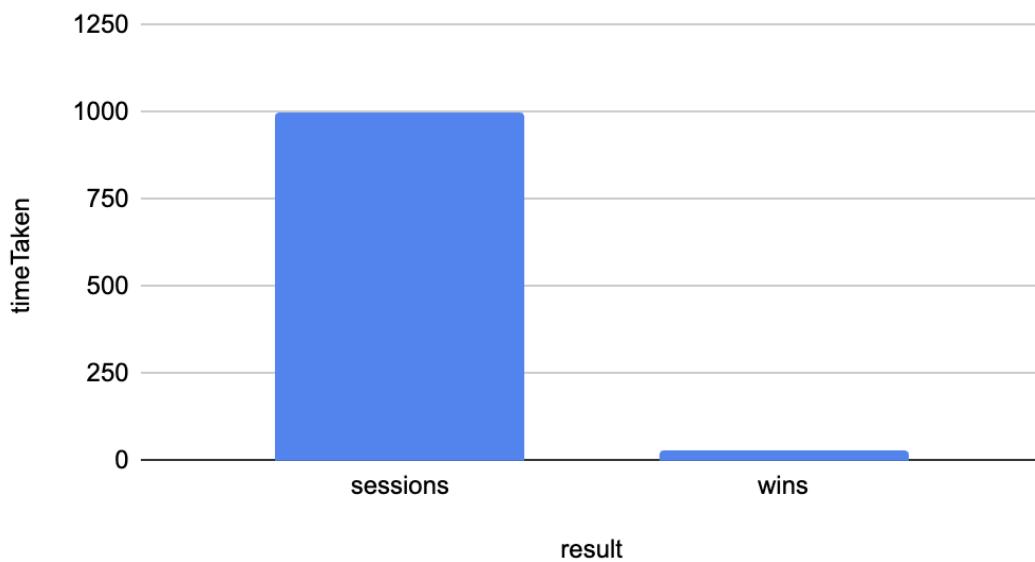
Games Won and Lost by Level



Fewer players tried Level 2 compared to Level 1. Only 3% of the players who played Level 1 won it, and only 1% of people who played Level 2 won it. There is no significant difference in difficulty between the levels.

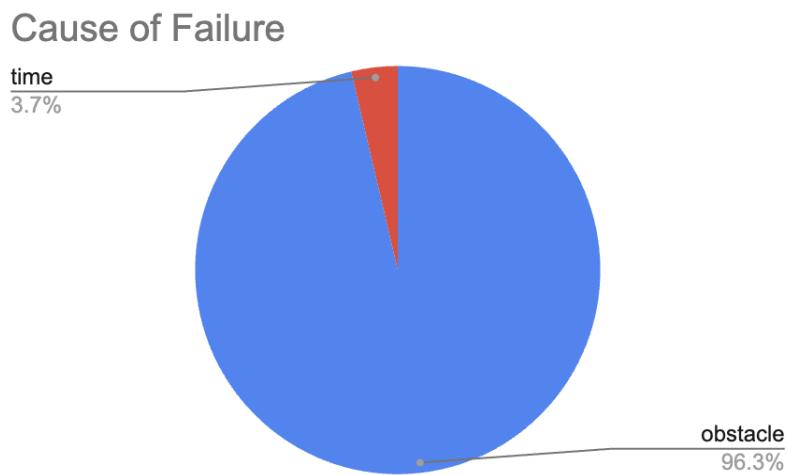
Sessions and Wins

Sessions and Wins



It can be seen that the number of players who successfully complete a level is negligible compared to the number of people who started the game. This can be attributed to the fact that a lot of players lose because of touching the obstacles.

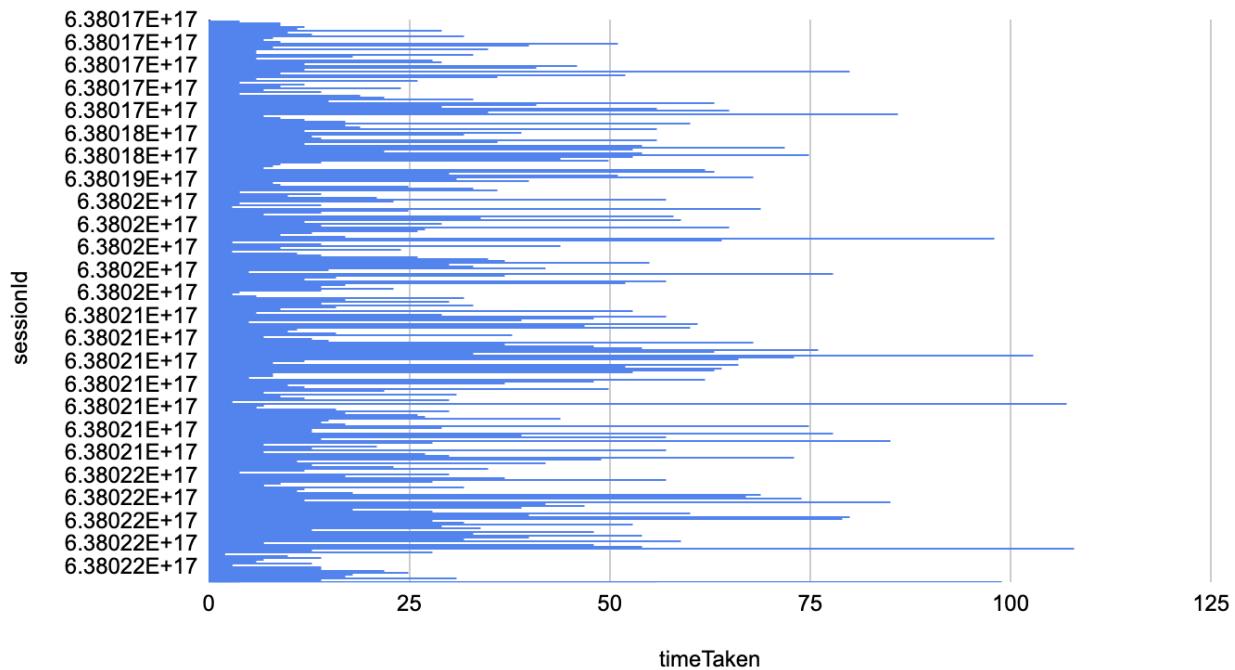
Cause of Failure



This graph shows that players almost always lost because of hitting an obstacle, but there were also players who kept going ahead but lost because of time.

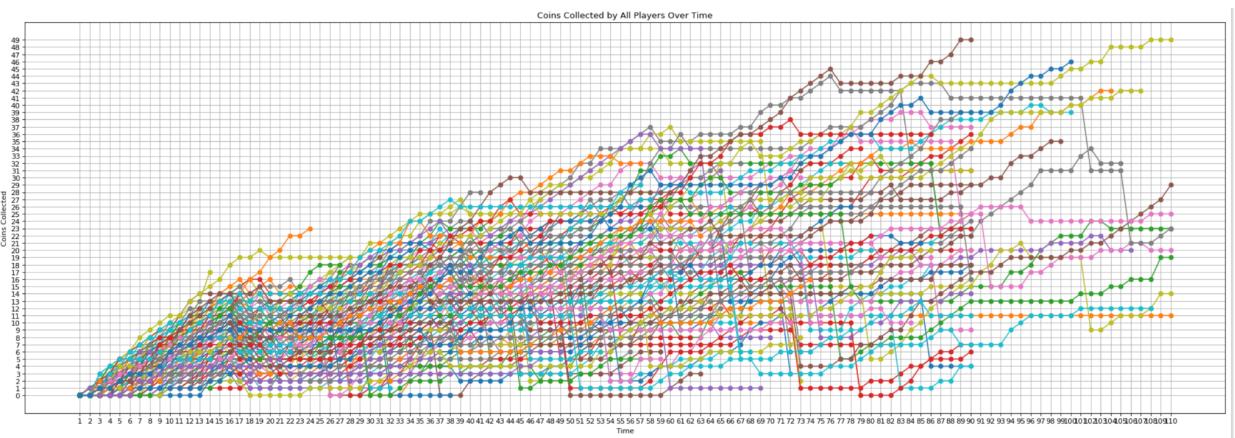
Obstacle Death Time Taken

Obstacle Death Time Taken



The density of the graph in the left corner shows that most players die in the first 12 seconds of the game due to hitting an obstacle. This tells us to better design how the obstacles are placed, and also underscores the necessity of a health system instead of a default loss on touching an obstacle.

Coins Collected Over Time



The long drops show that players are retrying questions by using their coins. Players who play the game for longer, stop collecting coins as shown by the horizontal lines towards the end on the right.

Mid-term Feedback Action Items

Sr. No .	Issue	Analytics/Feedback Source	Tasks to Resolve Issue	Feasible Within the Time?	Progress	Deadline
1	Players don't know about powerups	Through the feedback, we got to know that players do not know what the "hammer" and "clock" (powerups) are used for. We can see the graph for Cause of Failure and see that obstacle death is responsible for over 96% of game losses, in spite of there being a powerup that can prevent these deaths. This shows us that the players are not aware of what the obstacles are or what they are used for.	<ul style="list-style-type: none"> - Add power-ups in tutorial - Add intuitive animation when player collects the power-up - Differentiate power-ups from ingredients on the ground by adding spinning or bumping up and down effects to them 	Yes	Completed	Week 10
2	Players find the tutorial difficult	The feedback tells us that the tutorial is "too hard". When we see the Question Difficulty Analysis Graph, we observe that for some questions, half the people get it wrong. Even for the easiest questions, at least 6% of the players get it wrong. Therefore, for the tutorial, we need to ensure that we use an easy question.	<ul style="list-style-type: none"> - Make all elements in tutorial intuitive, remove all unnecessary stops - Give intuitive instruction in tutorial cooking station to help player understand how they could use 50-50 (red gem) and hints when answering questions in the real game 	Yes	Completed	Week 10
3	Players cannot control the character easily	A majority of the players in the feedback talk about how they find it difficult to control the player when pressing the right and left key. They have also mentioned dying easily when trying to jump over the obstacles. In addition to this, they have also pointed to a bug where going to the extreme sides of the track slows down the player. Difficulty in controlling the player is a major reason why most of the	<ul style="list-style-type: none"> - Increase jump force - Reduce horizontal speed - Fix speed decrease when player goes to the side of the track 	Yes	Completed	Week 10

		obstacle deaths occur in less than 12 seconds (see graph for Obstacle Death Time Taken).				
4	Players die easily	In the feedback, players mention that it was very disheartening to immediately lose when they touched an obstacle. We can see in the Sessions and Wins graph that out of ~1000 play sessions, only ~20 of them were completed. Obstacle death accounted for 96% of the deaths (Cause of Failure graph), and players died within the first few seconds of gameplay and had to restart (Obstacle Death Time Taken graph). Some players who played for 50 seconds or more died due to hitting the obstacles. This tells us that we need to have a mechanism where players do not die immediately upon contact with an obstacle.	- Health Hearts + Obstacles Modification: - Add 5 health hearts in each scene. - Add logic to decrement hearts at each collision and kill the player after 5 collisions.	Yes	Completed	Week 10
5	Players find questions too difficult	As we can see in the Question Difficulty Analysis Graph, out of 25 questions shown in the graph, more than half of them have been gotten wrong by more than 50% of the players. Some players mentioned in the feedback that the questions were too hard, and they had to Google them to find the answers. This calls for a mechanism to make the process of answering questions easy.	- 50-50 Power-Up -> Add intuitive instruction in tutorial cooking station to let player understand how 50-50 works - From the current list keep questions that are easy. Refer Questions Analytics chart to decide which questions are easy - No repeating questions -> Each question should be displayed to the player only once during their game session - Hint Power-Up: the player collects hints power-up and store in	Yes	Completed	Week 12

			bag, after entering the cooking station, they will be provided hints regarding the specific question if they click the hint power-up collected			
6	Players are not sure what happens when they answer a question in the Sanctum	In the feedback, players mentioned that they do not see what answering a trivia question does in the game. In the Coins Collected Over Time graph, we notice that relative to the number of players playing the game, the number of dips is low, suggesting that players are not entering sanctums. In the Sessions and Wins graph, we can see that only 2% of the players collect all ingredients successfully. This means that we need to find a way of telling the player why they should enter a Sanctum and what they will get when they answer a question.	- [1] Add animation when the player answers correctly to explicitly show that a dish is made. - [2] Add message/pop-up when player answers incorrectly and no coins are left to retry to explicitly show that the dish was not cooked.	Yes	Completed	Week 13
7	Players cannot access the pause menu easily	The feedback mentions that players cannot pause or exit the game easily because they have to use the mouse for it. This tells us that the players would prefer having a shortcut key to access the menu.	- Shortcut for pausing the game (P key)	Yes	Completed	Week 13
8	Players are confused when the character is at the start again after they exit the sanctum	This is mostly mentioned in the feedback. Players say that they would like it if they can continue from the same location because they saw another ingredient nearby but cannot go to it as the character restarts in the beginning of the path after exiting a Sanctum. In the analytics, we can see this in Coins Collected Over Time, even though players already have a lot of coins after entering one sanctum, they are	- Add checkpoints, so when a player exits the sanctum they resume from the same spot they entered the sanctum. To make sure that the player does not collide with obstacles or other sanctum entrances directly after the player exits the sanctum, we could give 1-3 sec immunity to the player.	Yes	Completed	Week 12

		forced to keep collecting coins and wait until the next Sanctum to use it.				
9	Players find the obstacles difficult and boring	In the feedback, players say that it was difficult to jump over the Trash Can obstacles. As can be seen in the Cause of Failure and Obstacle Death Time Taken graphs, a lot of players die due to hitting obstacles. One way to resolve this is by improving the movement of the players (point 3 above), but players had also suggested through the feedback to reduce the number of trash cans. Some other players found the game to be too monotonous with the same kind of obstacle and suggested to include other types of obstacles.	- Reduce Number of Trash Cans - Add other street obstacles, tailored for each level - Add moving obstacles in higher level	Yes	Completed	Week 12
10	Players are unsure about the differences in the two levels	In the feedback, players said they found the Beginner and Junior levels to be almost the same. 751 players played Level 1, and 548 players played Level 2, which is not a large gap, which leads us to believe that most people who played Level 1 also tried Level 2. The feedback tells us that we need to distinguish the levels from each other - right now the only difference is in the number of ingredients collected and the time.	- Each level corresponds to 1 recipe: So we collect related ingredients. - Each level corresponds to different power-ups - Add moving obstacles for both level 2 & 3 - Use different UI for each levels - Have different number of dishes as goal for each level	Yes	Completed	Week 12
11	Players think there is too much freedom of movement	In the graphs, we can see that only about 2% of people who play the game win it, and over 96% of players die due to obstacles. Some of the feedback mentioned that they would like the movement of the player to be restricted to 3 lanes (which is reminiscent of Subway Surfers).	- Restrict player movement to three lanes	No*	N/A	N/A

*This would require changing the spawning logic for all objects and the logic for interaction of the player with the objects. This would be a large design change. In the interest of time, we believe that the current game can be modified in other ways (controlling player speed, frequency of spawning objects) which offer the same advantage in ease of player control and movement.

Weekly Feedback

Date	Feedback	Changes
Sept 13, 2022	No time to read the text	Added welcome screen and start key
Sept 13, 2022	Don't know what the goal is	Displayed the goal on main game screen
Sept 13, 2022	Don't know what bag size is	Displayed the bag size on main game screen (later deleted this feature based on new game design)
Sept 20, 2022	Player touches the wall with jumps	Increase jump height
Sept 20, 2022	Player falls off left and right easily	Limited Player movement to tile space
Sept 20, 2022	Player not sure what the pink things (sanctum entrances) are	Changed Sanctum entrance to the ingredient it will give
Sept 20, 2022	Instructions at the beginning were a lot	Changed word instructions at the beginning to a playable tutorial level instead
Sept 20, 2022	Player doesn't know if it matters when she collects coins	Explicitly stated in the tutorial what does coins do
Sept 27, 2022	Class presentation - improve delivery of information.	Practiced delivery of presenting the game

Oct 4, 2022	When the player is trying to read the prompts in the tutorial, they get interrupted by something they encounter on the road.	Adjusted tutorial instruction: No instruction at the start of the tutorial for 1 sec, show instruction and pause the game until the player performs the action explained in the instruction.
Oct 4, 2022	The player said they can go most of the distance without having to jump with space, and can dodge obstacles only by moving left and right, but they would like to jump too.	Added randomness to the orientation of the obstacles, and made the obstacles longer in shape.
Oct 4, 2022	Player saw the same question again. Level difficulty is the same for the other level.	Fixed the sanctum questions issue. Added all questions to the sanctum quiz.
Oct 4, 2022	Looking for evolution and exploration of the game.	Added two types of power-up: break obstacles & slow timer.
Oct 11, 2022	Prepare for mid-term	Developed level 2, improved visuals of the game, and fine-tuned the analytics.
Oct 18, 2022 (Mid-term)	N/A	N/A
Oct 25, 2022	Listed in “Mid-term Feedback Action Items” (above)	Listed in “Mid-term Feedback Action Items” (above)
Nov 1, 2022	Game win-lose purely depends on luck (depends on whether the player knows the answer to the question or not).	Add new power-ups (50-50 & hints) to make answering questions fair to all players.

Nov 8, 2022	Explain modifications made by showing the game, and not just the analytics.	Presenting the game in the next class.
Nov 15, 2022	Some text is not visible, hard to read, too many red (color) on screen, format should be consistent, player would feel the information is important if they were stopped, vice versa	Applied uniform assets and text. Changed tutorial instructions, make the player stop when giving information instructions in tutorial.
Nov 22, 2022 (Email Feedback + Playtesting Feedback)	<p>[1] Game art is confusing,</p> <p>[2] Flooded the player with requirements of what to do, very few are intuitive.</p> <p>[3] Loads the player down with constant instructions in tutorial, and later adds collecting ingredients of a recipe that the player has to remember</p> <p>[4] Fixes provided more text, more explanations, more instructions. Give the players less to do, let them focus on core gameplay.</p> <p>[5] Game is disconnected - both a confusing endless runner, a cooking game and a trivia game</p> <p>[6] Balance concept seems irrelevant</p>	<p>[1] Polished up the UI, both 2D and 3D, made all background and text easy and clear to read.</p> <p>[2] Added intuitive tutorial for the game mechanism and power-ups: added animation such as arrow, changing character's skin when using a pan or losing heart; added intuitive instruction in cooking station to help player understand how they can use 50-50 and hints powerups</p> <p>[3] & [4] implemented queue-fashion bag, provided intuitive animation to show players whether they have all required ingredients for the recipe or not (emphasize the bag with special effect, instead of giving text); took off coin concept and timer power-up, let players to focus more on the core of this game</p> <p>[5] Tried to make it as</p>

		<p>relevant as possible: changed questions to be more related, intuitive animation after successfully cooking a dish, replace hammer power-up to a pan (cooking ware)</p> <p>[6] Took off the balance concept, change the goal for each level to make certain amount of dishes, implemented the queue bag so player has to strategize how they collect ingredients (not just a random collecting game)</p>
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High-level Changes to the Game Progression After Week 11

Old Design	New Design	Status
Player collects coins to spend on ingredients	Player collects ingredients	Completed
Player collects coins on the ground and pays an amount at the sanctum	Player collects ingredients, but the bag is queue-fashion, only three ingredients in the queue can count as owned items	Completed
Player enters sanctum to answer a question and receive the ingredient	Player can only get into the cooking station when they have a complete set of ingredients for that recipe; Player will successfully cook a dish after answering a question correctly.	Completed
The goal is to collect one count of each ingredient	The goal is to earn make certain quantity of dishes for each level	Completed

Only stationary obstacles	Moving obstacles/enemies in level 2 and level 3, replaced static obstacles in level 2 and level 3 according to different UIs	Completed
Trivia-based questions	Player can collect hints to answer the question, as well as using 50-50 (red gem) to eliminate two wrong answers in the cooking station	Completed

Supplemental Materials

List of Played Games

Name	Game	Genre
Christian Alcala	1. Stumble Guys 2. Call of Duty Warzone 3. Apex Legends	1. Indie 2. Action 3. Action
Atharva Agwekar	1. Red Ball 2. Fruit Ninja 3. Angry Birds	1. Arcade 2. Arcade 3. Strategy
Sanjana Baliga	1. Dots & Co 2. Lapse 3. Underhand	1. Puzzle 2. Strategy 3. Strategy

Vedika Jadhav	1. Candy Crush 2. Watersort 3. Pacman 4. Flappy Bird	1. Strategy 2. Puzzle 3. Arcade 4. Arcade
Gaurav Makasare	1. Brain it on 2. Magic Tiles 3. Chain Reaction 4. Block Sudoku	1. Puzzle 2. Casual 3. Arcade 4. Puzzle
Richa Maurya	1. Yummy Gummy 2. Flowfree 3. Bubble Shooter 4. Manuganu	1. Puzzle 2. Strategy 3. Strategy 4. Action/Adventure
Jiayu Pu	1. MemoryCards 2. Taiko no Tatsujin	1. Memory 2. Music video game
Niu Shang	1. Cut the rope 2. Carrot Defense	1. Puzzle logic 2. Strategy
Devang Sharma	1. Paper Toss 2. Doodle Jump 3. Slither.io	1. Arcade 2. Action 3. Action/Casual
Jiangyun Wang	1. 2048 2. Honor of Kings 3. Love and Producer	1. Puzzle 2. Action 3. Simulation

Nicky Wang	1. WHATTHEGOLF 2. Neko Atsume/Kitty Collector 3. I Love Hue	1. Casual 2. Simulation 3. Puzzle
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