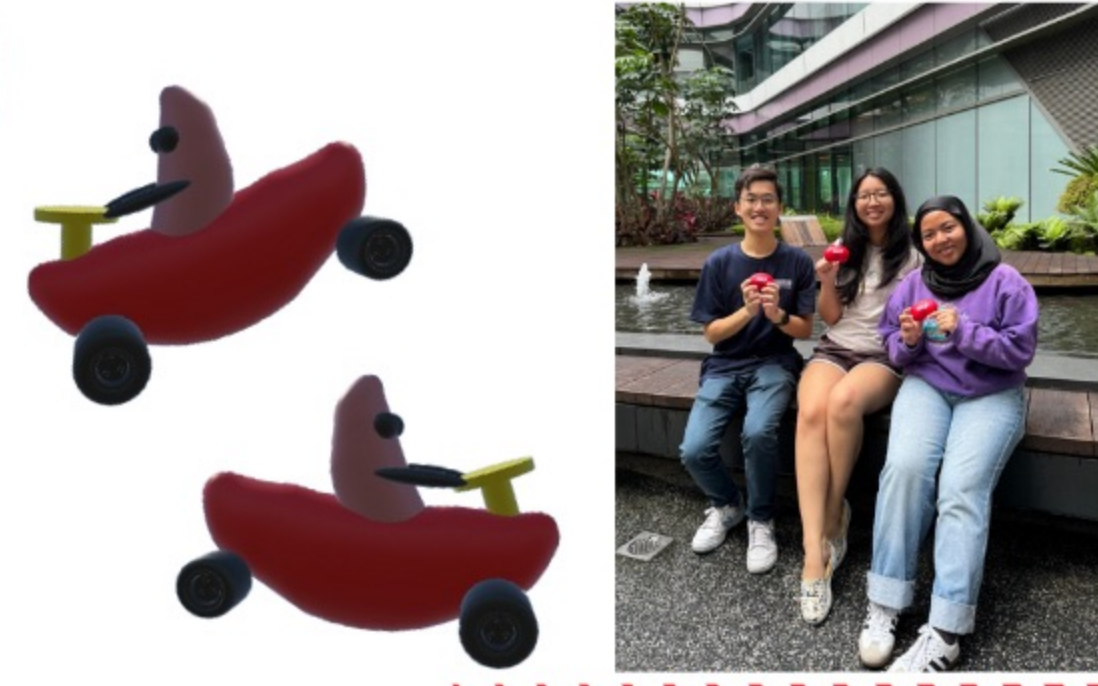


RENAL RACING

A game inspired by Mario Kart where players can compete with friends for the first place in go-kart races while using various power-up items.



Course: 01.101 Technologies for Sustainable Global Health

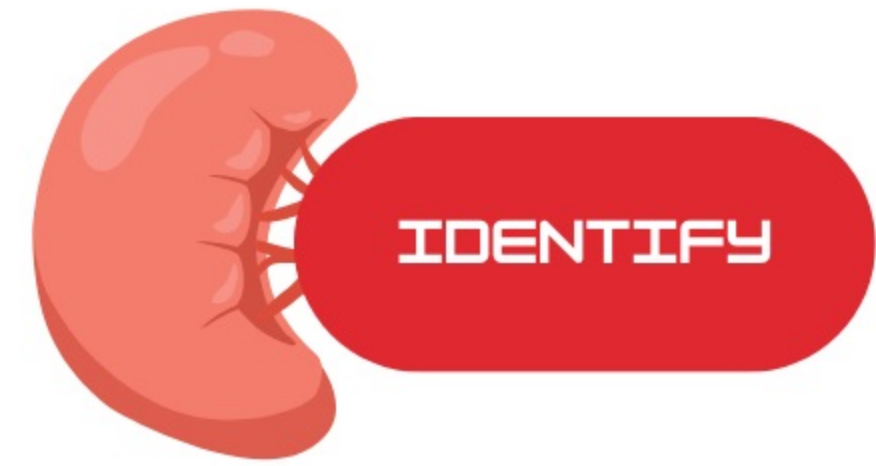
Instructor: Prof Shireen Goh

Team Members: Amni Syarah Imerya (1006144)
Cheong Kah Yen Kelly (1006064)
Yap Wei Ping Jordan (1005995)
Yeo Kai Wen (1005291)

Industry Partner:



School:



IDENTIFY

CURRENT RENAL LANDSCAPE

Singapore ranks 2nd in the world for diabetes-induced kidney failure¹

Singapore ranks 5th in the world for incidence (new cases) of kidney failure¹

Singapore ranks 2nd in the world for prevalence (existing cases) of kidney failure¹

There are currently more than 9,000 dialysis patients in Singapore³

Source: The National Kidney Foundation

NEEDS STATEMENT

A way to reinforce key messages about kidney health from NKF outreach programmes for Secondary to University students in order to reduce incidence of chronic kidney failure

NEEDS CRITERIA

Must-Haves	Good-to-Haves
Contains 2 key messages from NKF's outreach activities	Contains more than 2 key messages from NKF's outreach activities
Feature to test player's knowledge before and after playing the game	Educate on preventive measures for other kidney-related illnesses
Playable on web browser and mobile	More levels/storylines
Playable without internet	Multiplayer

FESM FRAMEWORK

Feasibility

Resource	Availability
Time	<ul style="list-style-type: none"> 9 weeks 3 hours/week
Manpower	<ul style="list-style-type: none"> All members have coding experience 1 have game development experience using Unity 2 have experience with digital art

Existing Solutions

NKF Games Renal Game

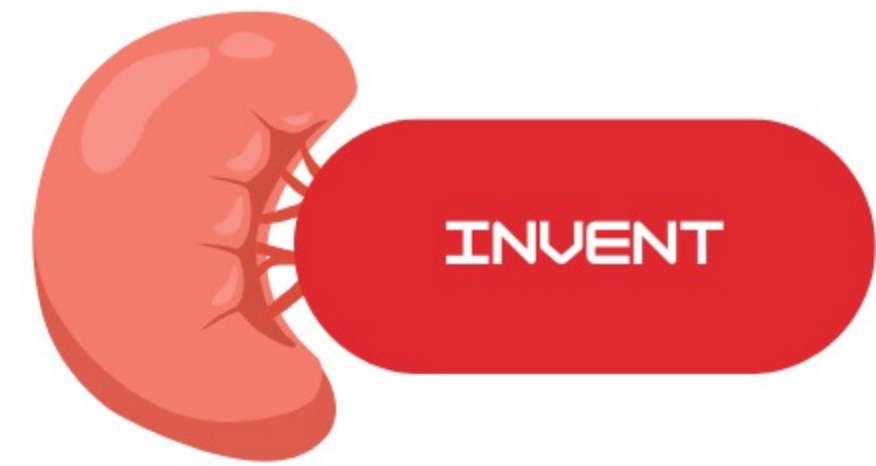
Healthy Kidney

Stakeholders

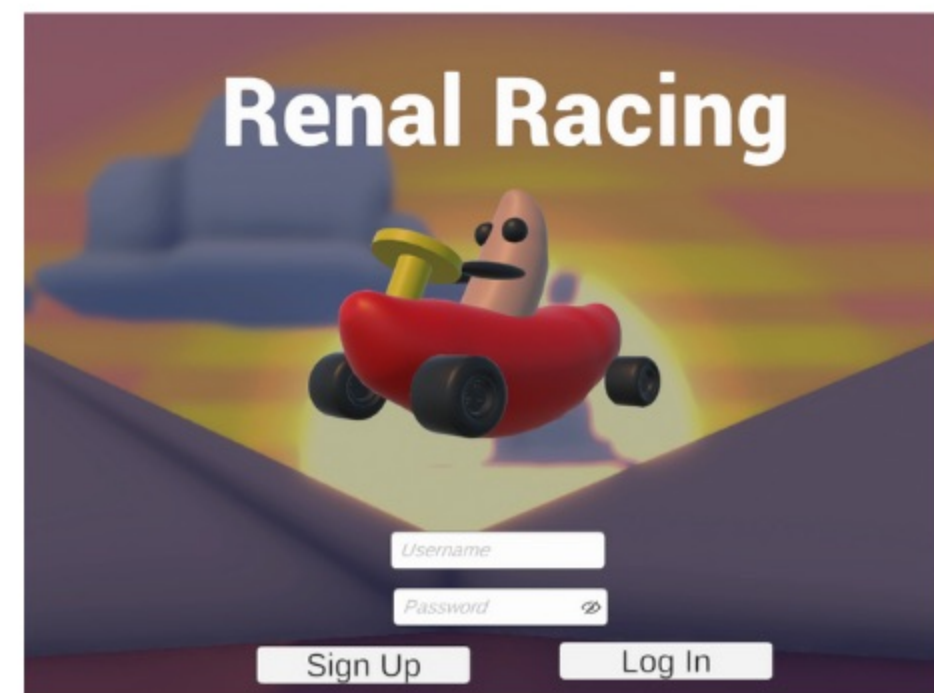
- NKF Industry Mentor
- Students at various educational levels
 - Secondary
 - JC/Polytechnic/ITE
 - University

Market Size

Market Segment	Size
Total Market Potential	USD 15 billion (2024)
Total Addressable Market	360,000 students
Estimated Share of Addressable Market	50,900 target students



INVENT



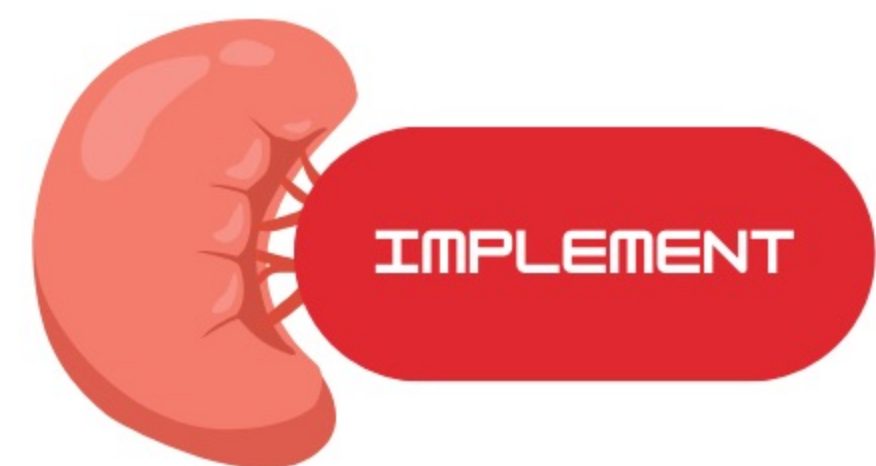
CONCEPT GENERATION & SELECTION

Concepts	Must-Haves	Good-to-Haves	Feasibility	Stakeholder	Total
Arcade	3	0	5	3	11
Kidney Pet	3	2	4	5	14
Story-Driven RPG	3	1	3	3	10
Renal Racing	3	3	3	5	14
Kidney Clash	3	2	2	3	10
Adventures in Renaland	3	2	3	2	10
K-Idney	4	2	4	3	12
Kick Your Kidneys!	3	1	5	2	11

CHOSEN IDEA: RENAL RACING

Reasons:

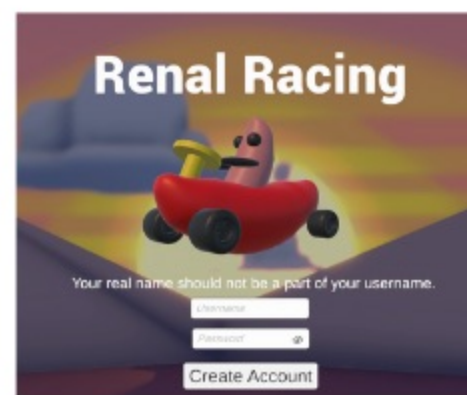
- Appeals to a wider age range of audience
- Fun, action-packed and engaging
- Multiplayer
- Instant gratification from winning



IMPLEMENT

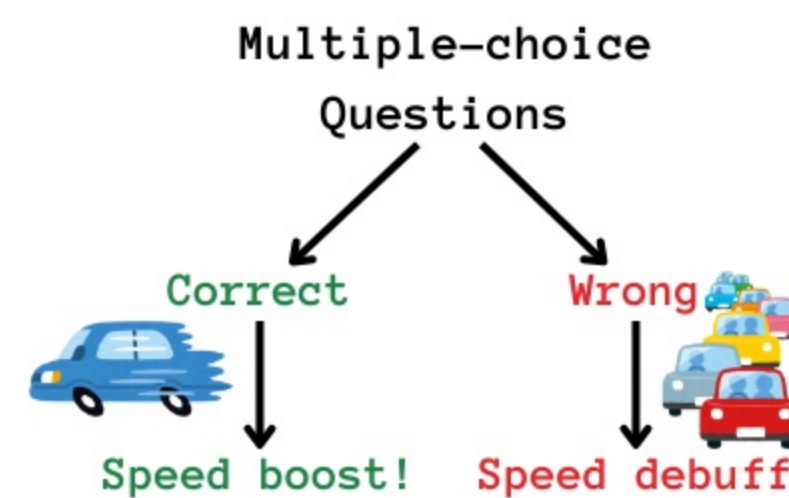
ACCOUNT CREATION

Players must create an account and log in to play. This ensures game continuity and allows for the tracking of their learning progress.



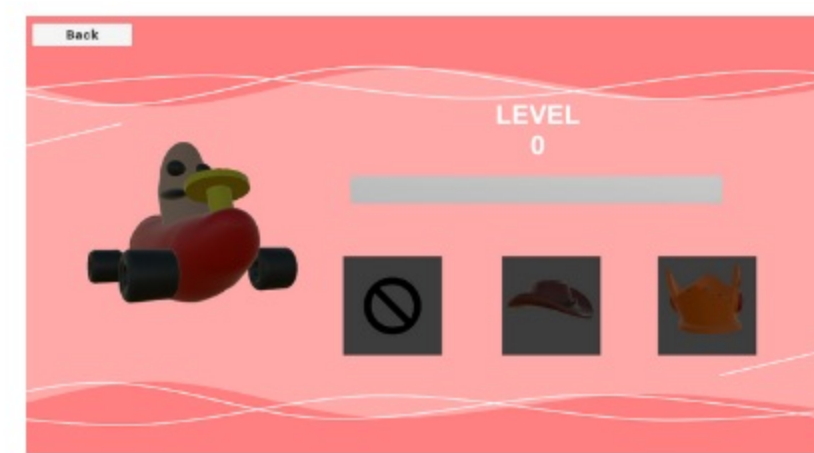
GAMEPLAY & LEARNING

Each round of the game includes 3 laps and players answer 3 questions about kidney health in each lap. Questions are in a multiple-choice format, with 3 choices for the players to choose from. Upon driving through an answer option, players will obtain a speed modifier:



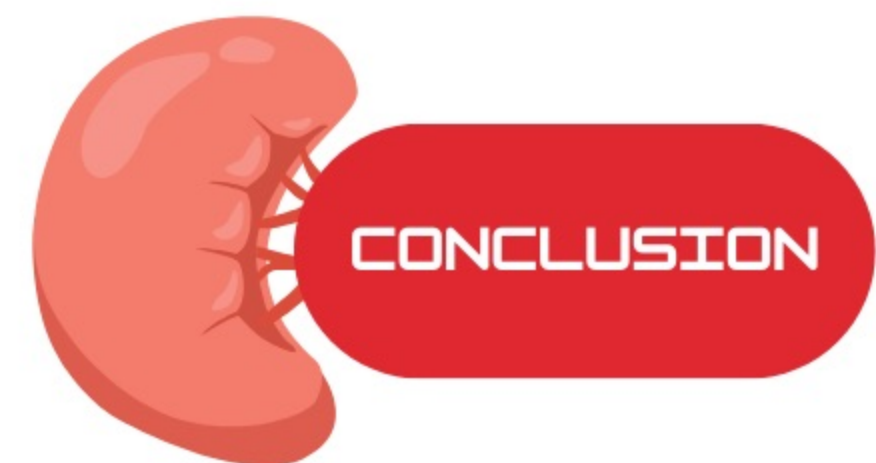
PROGRESSION & REWARDS

After every game, the number of correctly-answered questions will be converted into experience points (XP), allowing a player to level up. After advancing past certain levels, the player will be able to unlock cosmetics for their in-game character. This incentivises the player to keep replaying the game to unlock more collectibles.



PROTOTYPE

- Question: "What are the diagnostic tests for kidney screening?"
- Question: "Which vitamin deficiency can help prevent kidney disease?"
- Question: "What dietary advice can help maintain kidney health?"



CONCLUSION

TESTING METHODOLOGY AND RESULTS

Usability Testing

- Easy account creation
- Difficult to control
- Caters to a wide age range
- Easy to navigate through the game

Functional Testing

- Aligns with Needs Criteria
- Positive feedback from stakeholders
- Tracks progress of knowledge
- Enhances NKF's key health messages

Limitations

Currently only 12 questions

Challenges

Integration of different parts

Success

- Fulfilled most of the needs criteria
- Reward system
- Happy client
- Novices at Unity and C#
- Database Setup