

A photograph of two young women in a room. The woman in the foreground is a young Asian woman with short blonde hair, wearing a dark blue sweater with white stripes on the sleeves, smiling and looking towards the right. Behind her is a young Black woman with dark curly hair, also smiling. The background wall is white and covered with several small, rectangular photographs of various subjects like nature, buildings, and abstract patterns. A red date stamp '02/2020' is overlaid on the right side of the image.

02/2020

# SNAKE GAME PROJECT

At IU, June 08<sup>th</sup> 2020, Semester 2 (2019 – 2020)

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A background image showing a person in a white button-down shirt. Their right hand is extended, pointing their index finger towards the right side of the frame. They are holding a smartphone in their left hand. The image is slightly out of focus, emphasizing the hand and the text overlay.

**About Us**



Member: HA MINH KHOA  
ID: ITITIU19020 (70% / 3)

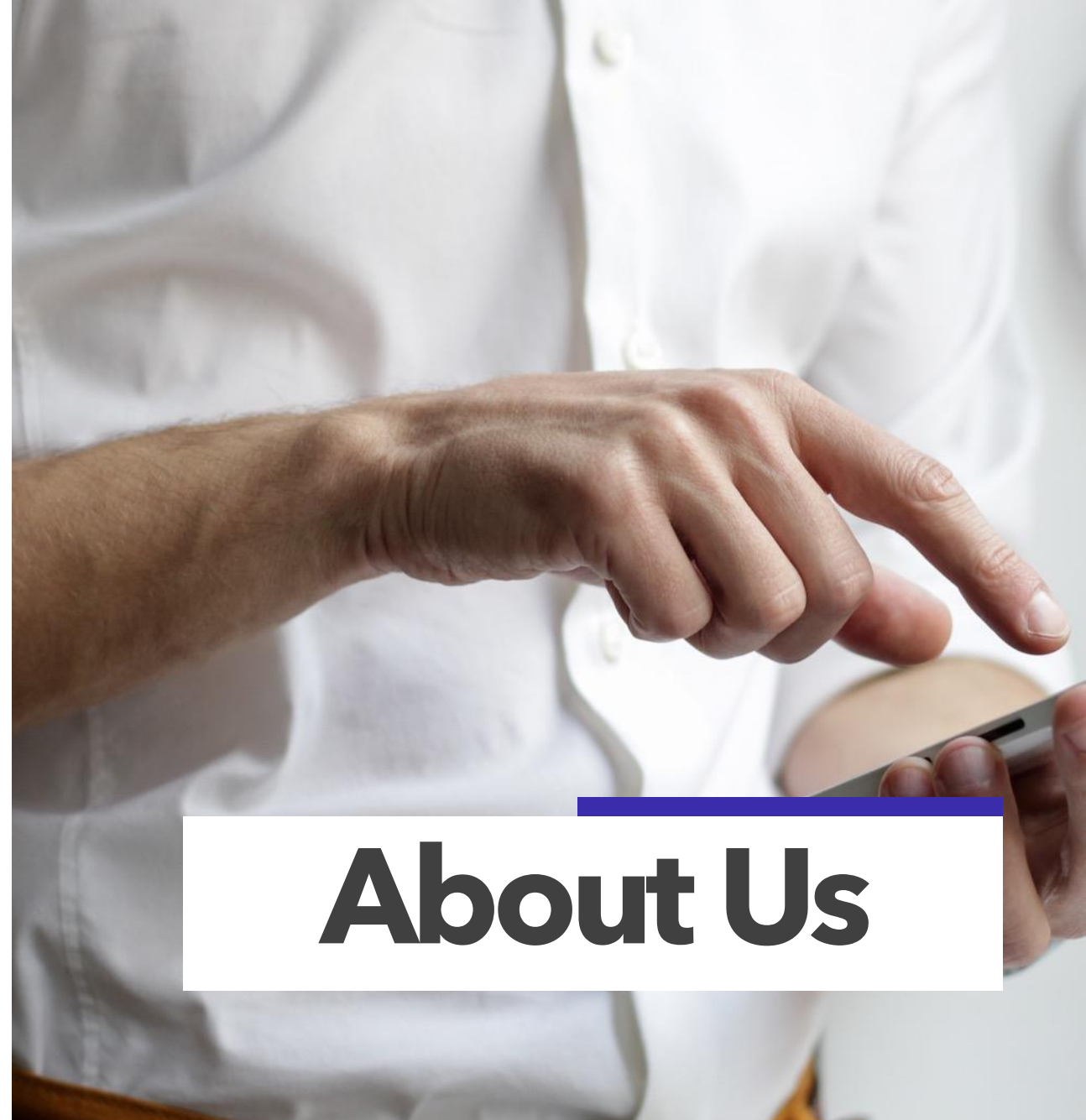


**About Us**

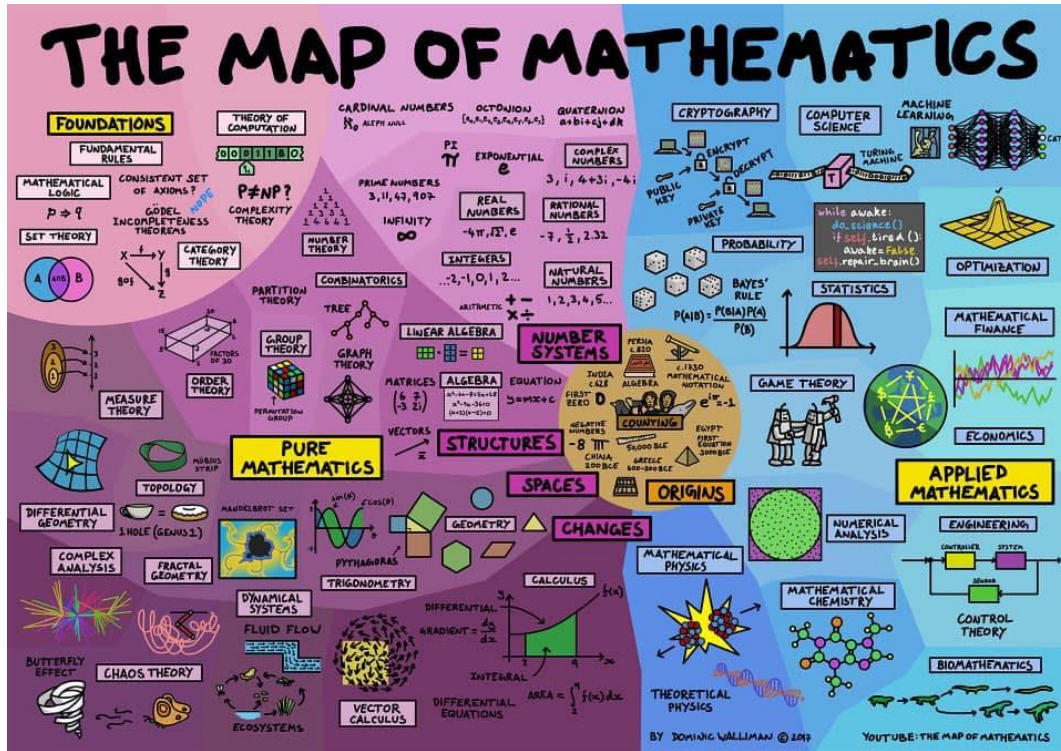




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# About Us



Member: TRAN MINH QUANG  
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About Us







# SFML Library

<https://www.sfml-dev.org/index.php>

- Multi-media, multi-platform, and multi-language.
- Tutorial: included in GitHub with the name: Snake-Game-at-IU (public) – Full instruction to install the game



# Food

- Three types of Fruit with random generator:
  1. Apple: 2 points
  2. Melon: 5 points
  3. Strawberry: 10 points

# ADDITIONAL FEATURES





# Music

- Six (06) suitable music included
- Can choose to pause or replay that music again without causing troubles
- Restart function: Reset the game and randomize music

# Game Status

- Immediate troubles from players. How to solve?
- Pause, Replay, Restart, Mode Changing, and Exit button



# Score Database

- Programmers wants players to achieve some extent of satisfaction through score comparison.
- No score is stored because player will continue playing over and over which decrease the working efficiency and attention, causing insomnia and headache if scores are stored





# Game Mode (Part 01)

- Six (06) different Game Mode: Single Easy, Single Hard, Single Brutal, Double Easy, Double Hard, Double Brutal (changeable).
- Differentiating by “Delay” variable, Game Rules, and Obstacles



# Game Mode (Part 02) – Delay variable

- Delay variable determines the speed of snake.
- Easy:  $Delay = 0.15(1 - 05\%)^{int \frac{Time}{30}}$
- Hard:  $Delay = 0.10(1 - 10\%)^{int \frac{Time}{30}}$





# Game Mode (Part 02) – Delay variable

⇒ Most will fail after 15 minutes in Easy Mode and 7.5 - 10 minutes in Hard Mode and 5 minutes after 5 minutes in Brutal.

(Human Reaction ranging from 0.1 s <-> 0.3 s)



Time Passed (s)	Delay (s) in Easy Mode	Delay (s) in Hard Mode
0	0.15	0.1
60	0.1353	0.081
240	0.0995	0.0478
300	0.0898	0.0348
450	0.0694	0.0205
600	0.0537	0.0121
900	0.0323	$4.239 \times 10^{-3}$
1200	0.0193	$1.478 \times 10^{-3}$
1800	$6.91 \times 10^{-3}$	$1.797 \times 10^{-4}$
2400	$2.477 \times 10^{-3}$	$2.185 \times 10^{-5}$
3600	$3.184 \times 10^{-4}$	$3.229 \times 10^{-7}$



# Game Mode (Part 03) – Game Rules

## EASY MODE

- Snake can pass wall, bite himself or other Snake
- Low Speed Initial, less Obstacles (still random)

## HARD MODE

- Snake cannot pass wall, or bite other Snake
- High Speed Initial, more Obstacles (still random)



# Game Mode (Part 04) – Obstacles

## EASY MODE

- Durations: 20 seconds
- After 35 seconds passed: ObstacleNumber += 10;

## HARD MODE

- Durations: 30 seconds
- After 45 seconds passed: ObstacleNumber += 30;





# Game Mode (Part 05) – Brutal Mode

- **Obstacles:** Some obstacles can be repeated so the factual number of obstacles is smaller than the theoretical one. (Duration: 45s)

$$\text{Obstacles} = 10(1 + 75\%)^{\text{int} \frac{\text{Time}}{60}}$$

- **Game Rule:** As same as Hard Mode, but Snake cannot bite himself.

- **Speed:**  $\text{Delay} = 0.10(1 - 10\%)^{\text{int} \frac{\text{Time}}{20}}$

Time Passed (s)	Delay (s) in Brutal Mode	Number of Obstacles (Theoretical)
0	0.1	10
60	0.0729	17
120	0.0531	30
180	0.0387	53
240	0.0282	93
300	0.0205	164
360	0.015	287
420	0.0109	502
480	$7.977 \times 10^{-3}$	879
540	$5.815 \times 10^{-3}$	1539
600	$4.239 \times 10^{-3}$	2639



# Game Mode (Part 06) – Bonus Time

- After 75 seconds in silence, there are 150 fruits available on the screen (theoretical) on the screen for 15 seconds before disappearing. However, this bonus time can cause death if players does not pay attention.



Score = Score + 10

Length = Length + 5



Score = Score + 20

Length = Length + 10



Score = Score - 50

Length = Length - 25

# Note

- Obstacles can appear randomly **without warning** to increase the Game Difficulty. But you will only die if you hit the Snake's Head into it. Obstacles will appear again after 15 seconds of disappearing.
- If you are unlucky, **"nhân phẩm kém, thích cà khịa"**, the Obstacle will appear **right on** the Food's place, so you will have to wait.

# Recommendations

In order to achieve highest level of satisfaction:

- A personal computer (PC) or laptop is a must.
- You must have the ability of counting time, guessing Obstacles, and tricking partners (you have to be smart if you played in Double Mode)
- You have to be patient at all time.
- You must have high luck. Do not overuse your lucky point overwhelmed.
- You have already known the rules thoughtfully.
- **Note:** You have to experience Easy Mode at the first trial (Three to five times for sure) before trying at Hard Mode or Brutal Mode. You have to pass at least three to five times with at least five (05) minutes each at Easy Mode before reaching to Hard Mode, and at least three to five times with at least three (03) minutes each at Hard Mode.



# CONCLUSION

# WORTH-PLAYING GAMES

# CITATIONS

1. SFML Library: <https://www.sfml-dev.org/index.php>
2. Git-Hub Repository: <https://github.com/IchiruTake/Snake-Game-at-IU>



# THANK YOU

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