

# CSC258 Project proposal

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1. The type of project
  - a. Individual project  
I will do the project myself.  
(Why not looking for a partner? Time zone differences + I feel myself suitable for doing it on my own (doing so individually will be more challenging but I will try to make it)
  - b. 10000% myself :D
2. Description of game
  - a. Basic game rules
    - i. Spacecraft moving on a rectangular game area, moves controlled by input from keyboard.
    - ii. Random obstacles appear in the game area and consistently generating new from right and vanishing from left.
    - iii. Target is to prevent interaction with the obstacles, each crash will result in reduction of health.
    - iv. Showing hp (health points) as hearts on the top of game view
    - v. When you run out of health, game ends.
    - vi. Have a game start menu screen and end of game screen.
  - b. Additional features
    - i. Create animation for the hit/hurt/break of spaceship/obstacle and allow grazing (interaction with small part may result in a reduction of damage) (This is a modification of the grazing feature, which also involves random number to represent chances of a near miss)
    - ii. Assign points to player on every successful prevention of crash and show total score on the end of game screen.
    - iii. Changeable difficulty/difficulty adjust to game play (become harder and harder as time goes by increasing moving speed, length of obstacles, and new look of obstacles) (This is a combination of the features i and ii.)
3. Proposed methodology
  - a. I will have two methods for generation of obstacles and spaceship, each will write to memory
  - b. I will use two methods correspondingly to erase spaceship and obstacles, each will assign the painted points black
  - c. I will use random generator to get the initial position in rows of obstacle
  - d. I will scan the screen and determine collision in each frame by  $d(\text{spaceship}, \text{obstacle}) < \text{obstacle\_size}$
  - e. When collision happens, the animation of hurt will be triggered by chance
  - f. I track multiple obstacles on the screen by storing their positions in memory
  - g. I track position of spaceship also in memory

- h. I will increase the difficulty by changing the pre-stored generating rate and level variable, which enables multiple types, more obstacles, and faster for them to move
- 4. Planned milestones
  - a. Milestone 1
    - i. Create spaceship avatar
    - ii. Create obstacle figure
    - iii. Obstacle appear, move and disappear
    - iv. Create game start screen
    - v. Create game end screen
    - vi. Showing health hearts on top of the screen
    - vii. Enable restart by pressing "P" on the keyboard
  - b. Milestone 2
    - i. Spaceship move according to keyboard input
    - ii. Collision detection and recording (by reduce of health)
    - iii. Show remaining "health" of the ship (will be reduced on each collision)
    - iv. Running out of health -> game over screen
  - c. Milestone 3
    - i. Assign score to player when successfully avoid collision
    - ii. Implement different types of collisions by different color on the spaceship and reduction of health
    - iii. Implement different types of obstacle (different size, color, look)
    - iv. Add difficulty by increase speed, appearance rate, size, color of obstacles every 10 seconds (possibly show a screen of level up?)