

# CS 116

## Programming Assignment 6

### Final Project

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This assignment is your final project. It is the combination of everything we learned this semester. The estimated time for completion is about ten hours (you will have four of them with me in class).

In this assignment, you will implement one level of a game called “Shooter”. You have to write all the classes and functions needed. This time, I will not guide you with the architecture; you are free to create functions, classes, variables... as long as you get the desired output.

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## Details

The game consists of a ship controlled by the player (movement using the keyboard and shooting using the mouse) that needs to avoid/shoot enemies coming at it while trying to collect stars.

I'm going to list all the requirements bellow make sure you implement all of them:

### Controls:

- Ship moves using the W,A,S,D keys. It needs to move according to the direction it is facing
  - W move forward
  - S move backwards
  - D rotate clockwise
  - A rotate counter-clockwise
- Ship's movement should be velocity based, so I need to see acceleration when pressing W and deceleration when pressing S
- Ship shoots using the mouse
  - Left click will shoot one bullet
  - Direction of the bullet should be dependent on the ship's position and the position of the mouse

### GamePlay:

- If the ship goes outside the screen from one side, it needs to comeback from the other side.
- If the ship collides with an enemy it will get re-spawned in the base (black square on the left corner)
- If the ship collides with a star, the star disappears (increasing the score by 50) and the ship needs to collide with the base again to spawn
- Shooting an enemy will increase the score by 10. The shot enemy has to play an explosion animation then disappears

**More Details:**

**Note: All the numbers (in red) that I will specify in this section can be modified according to your art, as long as the main concept and behavior is still there.**

- Enemy
  - Spawning an enemy should happen every 20 game loops (since we don't want the screen to be full with enemies)
  - Get spawned on the left of the screen. X = 550 Y = Random value between 75 and 375 with a random speed between 5 and 10
  - Will always move from the left to the right and will get destroyed if he is outside the screen.
  - When collided with a bullet, the enemy should play a death animation then get destroyed.
- Star
  - The star get spawned anywhere on the screen (of course each time randomly)
- Bullets
  - Should be destroyed when they are outside the screen or when they collide with an enemy.
- Ship
  - When collided with an enemy, the ship should get re-spawned in the base (safe area) and will not move waiting for a new user input.

**NB: Check the "Shooter.swf" given to you to see the result.**

**Bonus Details:**

**NB: Before you even think to start with the bonus part, make a back-up to what you have so far.**

In this assignment, I'm giving you a chance to get bonus points. You can get up to 35 extra points reaching a total of 135 (if everything is correct).

- Bonus 1: (10 points)
  - Add bullet and ship death animations.
  - When the bullet collides with the enemy it will play a death animation and then get destroyed
  - When the ship collides with the enemy, it will play a death animation and then gets re-spawned in the base.
- Bonus 2: (10 points)
  - Add a main menu screen that contains: New Game and Credits
  - Pressing "N" will take me to New Game, no need to go back to the main menu here.
  - Pressing "C" will take me to Credits screen, where I can press "M" to go back to the Main Menu
- Bonus 3: (15 points) → You need to implement Bonus 2 first
  - Add lives to the ship.
  - When lives reach 0, take the player to a lose screen showing him his "High Score"
  - In the lose screen, you can press "M" to go to the main menu
  - Once you are in the main menu, all it's functionalities should be there
    - You can press "N" again to replay the game.
    - You can press "C" to go to credits ...
    - If you chose to replay the game, everything should be re-initialized as if it is your first time playing the game.

## Comments

In this and future assignments, you are required to include:

- A file header comment at the beginning of the fla. The format is shown in the "Comments.flc" file given to you in the beginning of the semester and should be present at the very top of all your code.
- Function header for each function you create. The format is shown in the "Comments.flc" file given to you in the beginning of the semester and should be present at the top of every function.
- Inline commenting for your code.

## What to submit

You must submit the fla file (**Shooter.flc**) in a single .zip file named correctly (go to the class page on moodle and you will find the assignment submit link). **Do not submit any other files than the ones listed.**

If you've forgotten how to submit files, the details about how to submit are posted in the syllabus. Failure to follow the instructions will result in a poor score on the assignment (and possibly a zero).

**NOTE: Treat this assignment as if it is assignment 6!**  
**So the zip file name should be:**  
**cs116\_yourlogin\_6.zip**

## Special note:

The due date/time posted is the positively latest you are allowed to submit your code. Since the assignments can easily be completed well before the deadline, you should strive to turn it in as early as possible. If you wait until the deadline, and you encounter unforeseen circumstances (like being sick, or your car breaking down, or something else), you may not have any way to submit the assignment on time. Moral: **Don't wait until the last day to do your homework.**