# Bullseye Programming

Write a Bullseye program. The Bullseye program is an interactive graphic program that allows the user to shot at a moving bullseye target. The bullseye starts at the top of the screen and moves from side-to-side; ricocheting when it collides with the sidewall of the screen. Each time the bullseye collides with the sidewall, it (the bullseye) drops down towards the player.

The player is represented as a rectangle near the bottom of the screen. The user can move the player (using the arrow keys) left or right. The player cannot move off-screen.

The player can fire a single projectile to try and hit the moving bullseye. If the player hits the projectile three (3) times, the game stops and prints "You Won!".

If the bullseye collides with the player, the game stops and prints out a message "Game Over!"

Notes:

- Bullseye
  - was created using 3 concentric circles (with radius 100, 50, 25). Feel free to experiment
  - I changed the reference point of circles to their centers (see ***sf::CricleShape.setOrign()***). That made positioning them more intuitive.
  - Moves horizontal (across screen)
    - When it hits an edge, the y-position increases (it moves closer to the player)
  - I changed the color  (and size) of the bullseye when projectile collides to add visual acuity. (you don't have to do this, but it adds visual appeal.)
- Player
  - Was created using sf::RectangleShape(), centered on the width of the screen and about a 100 pixels from bottom edge (you can to make it look nice.
  - Use the keyboard arrow keys to move player left or right. Your code must prevent the player from going off screen
    - Code snippet to testing if users pressed arrow…

```
if(sf::Keyboard::isKeyPressed(sf::Keyboard::Right) )
```

  - Pressing the **spacebar** fires a projectile.

- Projectile
  - Small rectangle that moves in a vertical position only.
  - Only one project can be fired at a time and only one projectile active (visible) at any given time.

Relevant SFML pages:

- Texts and fonts
    - https://www.sfml-dev.org/tutorials/2.5/graphics-text.php

- Keyboard Events (arrow keys and spacebar)
    - https://www.sfml-dev.org/tutorials/2.5/window-events.php
    - https://www.sfml-dev.org/documentation/2.5.1/classsf_1_1Keyboard.php

- Positioning, changing size of a shape and changing origin (reference point) of a shape
    - https://www.sfml-dev.org/tutorials/2.5/graphics-transform.php
- Testing for collision
    - Bounding box
        - https://www.sfml-dev.org/tutorials/2.5/graphics-transform.php
        - Previous homework

Helpful Advice:

- Major programming constructs include:
    - Loops and selection statements
    - Relational and logical expressions
    - const variables, variables
    - declaration statements
    - arithmetic expression
    - etc.
- Write a simple design first (on paper), i.e. pseudo code that identify high-level steps of the program
- Focus on one aspect of the program at a time.
    - For example
        - Draw player.
        - Move player to left when user presses spacebar.
        - Then ensure player does not move off screen
        - Repeat above steps for moving right.

    - Now focus on drawing bullseye
    - Next focus on moving bullseye left
    - Next make sure bullseye does not go off screen
    - Etc.

A Demonstration video of program will be on canvas.

Good luck hackers!!!

**Some dimensions I used (you can vary them)**

- Screen dimensions 1920x1600 pixels
- Circles for bullseye radius: 100, 50, 25
    - Bullseye drops 50 pixel every time it hits an edge
- Player start position x=window with/2, y= 30 pixels above bottom of window
- Player size 40x120 pixel
- Projectile size 10x40 pixel

**Extra credit**

- Change the size of the bullseye when it gets hit by a projectile
- Overlay the circle (bullseye) and the player with an interesting texture (see sfml-dev.org) about textures and sprites
- Add ability to fire 3 projectiles, that is 3 active projectiles at any time.