Target Game

What are we aiming for?

We are going to make a game where you hit targets with the mouse.

Why?

It's a fun game and we will be going over lots of skills from last term. See how many you remember!

Steps to make this app:

1. Draw the target.
2. Check if the target it hit.
3. Redraw the target in a new position (eg when it is hit).

1: Draw the target:

1. Make a new project - save to USB.
2. Use ellipses to make a target - like one of the ones below. Choose the number of rings and colours you want yours to have.
    a. Use variables for the center of the target. This will make it easier to test if it is hit, and later move the target around. You will need two variables: for the vertical and horizontal position of the target.
3. Put the code to draw the target in a ***custom function***.

Custom function*: are functions like* ***`ellipse`*** *or* ***`rect`*** *- just you decide what they do. They need a name, return type, inputs and code block. We define them at the bottom of the program.*

Name:`drawScore()` Returns: nothing (void) like ellipse or rect.	Name: `hasHitTarget()` Returns: a boolean (true or false). ie has a value. like `dist`().

`void drawScore() {`
`  text("score: "+score, 20, 15);`
`  text("shots: "+numShots, 160,`
`15);`
`}`
	`boolean hasHitTarget() {`
	`  if(distFromTarget<`
	`targetRadius){`
	`    return true;`
	`  }`
	`  else {`
	`    return false;`
	`  }`
	`}`

Your `draw()` function should look something like this :

```
void draw() {
  background(0,200,0);
  drawTarget();    //or whatever you name your function
}
```

2: Check if the target gets hit.

To do this we will check the distance between the center of the target and the mouse.

1. We need to get the distance between from the **center of the target to edge** of the target.
   a. Is easy to get - it is half the width or height (they are the same as the target is a circle).
2. We need to compare that to the **distance between the target center and the mouse** (using the horizontal positions of the target and mouse)
   a. We need to use the `dist()` function. This returns a number (unlike `ellipse()` or `drawTarget()` that are void: therefore return nothing.)

If you are stuck here is some code to get you started:

```
float mouseDistToTarget=dist(targetHozPos, tagetVertPos, mouseX,
mouseY);
float targetRadius = targetSize/2;
if(mouseDistToTarget  <= targetRadius) {
    newTargetPosition();    //what happens when you hit the target?
}
```

We only want to do this check if the mouse is released, therefore where in the code would be put this?

3: Redraw the target in a new position (eg when it is hit).

When the target is hit - we want to make a new target - somewhere else on the screen.

So make another custom function. Again it will return nothing (so will be `void`), I'm going to call mine `newTargetPosition()`.
In this function - make the position of the target random. Use the `random()` function to set the horizontal and vertical position of the target to a random number between 0 and either the width or the height of the screen.

To get a random number use the `random()` function. Like `dist`() it returns a number (is not `void`).
When using `int` you have to tell it to return whole numbers:

```
= (int)random(0,width);
```

Improvements you can make:

- Add a score.
    - Stored in a variable.
    - Goes up if you hit the target.
    - Show the score at the top of the screen. (Use the `text()` function to show text.)
- Add a limited number of shots:
    - Stored in a new variable.
    - Everytime you click the mouse - you use a shot.
    - Game is over when you use all of your shots.