# Valiant robots

Week 2 exercises



# Building and Programming robots in TINKERCAD

This week you be continuing with the Valiant robots through TinkerCAD. This workshop aims to develop your text programming skills.

Continue editing your circuit from Week 1 Please complete the bronze requirements before starting the silver, and complete the silver before starting the gold.



#### Steps:

Continuing from week 1s circuit, update the program to use the reading from the LDR in an ifstatement. Turn the LED on if it is dark, e.g. light level is less than 160, otherwise turn off the LED.



## SILVER Challenge:

#### Aim:

• Add control over the servo

#### Steps:

- 1. At the top of your program add the line: #include <Servo.h>
- 2. Then add the variable: Servo myServo;
- 3. In the setup() function, add:

myServo.attach(12); //servo on pin 12



## SILVER Challenge:

#### Aim:

• Rotate the servo between the angles 0, 90,180 and 90 with a delay of 1 second in between each movement

#### Steps:

4. Inside the loop() function
myServo.write(angle); // servo angle
delay(duration); // duration in ms



## **GOLD Challenge:**

#### Aims:

- Play a tone based on the reading from the LDR
- if the light level is less that 60, play the tone frequency 65
- otherwise if the light level is less than 100, play the tone frequency 82
- otherwise if the light level is less than 160, play the tone frequency 98
- otherwise if the light level is less than 220, play the tone frequency 131
- otherwise if the light level is less than 280, play the tone frequency 165
- otherwise if the light level is less than 340, play the tone frequency 196
- otherwise if the light level is less than 400, play the tone frequency 262
- otherwise if the light level is less than 460, play the tone frequency 330
- otherwise if the light level is less than 520, play the tone frequency 392
- otherwise play the tone frequency 523



### **Extension Challenge:**

#### What else can you add to this program?

- The map function can be used to scale values between different ranges int result = map(inputValue, inputMin, inputMax, outputMin, outputMax);
- Use the map function to adjust the LDR input to the range of servo angles (0-180 degrees)
- Write a short tune to play with the piezo buzzer



## **Thank You**

