COMP6043 Physical Computing Lab 7

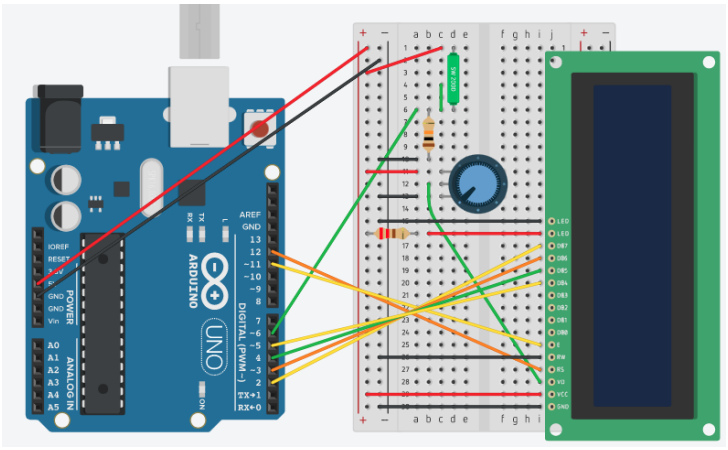
Note: if a task asks you to demonstrate your work to your lecturer, you must demonstrate and get your work signed off. Otherwise, no marks will be awarded for your work.

Once completed, upload your report to Canvas.

This lab is based on the Arduino Project 11 – Crystal Ball (p.114 – p.123) in the Arduino Projects Book (p.86).

Task 1 [60%]

Wire up your circuit as follows:



Upload the following code to the Arduino on TinkerCad and verify that your project works correctly.

Using the virtual classroom, and the conferences chat function, demonstrate your project to your lecturer once completed.

```
#include <LiquidCrystal.h>;
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

const int switchPin = 6;
int switchState = 0;
int prevSwitchState = 0;
int reply;

void setup() {
  lcd.begin(16, 2);
  pinMode(switchPin,INPUT);
  lcd.print("Ask the");
  lcd.setCursor(0, 1);
  lcd.print("Crystal Ball!");
}

void loop() {
  switchState = digitalRead(switchPin);
  if (switchState != prevSwitchState) {
      if (switchState == LOW) {
    reply = random(8);
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("The ball says:");
    lcd.setCursor(0, 1);
    switch(reply){
      case 0:
      lcd.print("Yes");
      break;
      case 1:
      lcd.print("Most likely");
      break;
      case 2:
      lcd.print("Certainly");
      break;
      case 3:
      lcd.print("Outlook good");
      break;
      case 4:
      lcd.print("Unsure");
      break;
      case 5:
      lcd.print("Ask again");
      break;
      case 6:
      lcd.print("Doubtful");
      break;
      case 7:
      lcd.print("No");
      break;
      }
      }
    }
    prevSwitchState = switchState;
  }
```

Task 2 [10%]

Modify your project to add an extra response from the crystal ball: have the crystal ball print your name as a possible response.

Include your code, and a screenshot, in your report.

Task 3 [30%]

Add three LEDs – green, orange and red – to your circuit that operate as follows:

Response	Green LED	Orange LED	Red LED
Yes	ON	OFF	OFF
Most likely	ON	OFF	OFF
Certainly	ON	OFF	OFF
Outlook good	ON	OFF	OFF
Unsure	OFF	ON	OFF
Ask again	OFF	ON	OFF
Doubtful	OFF	OFF	ON
No	OFF	OFF	ON
`Your name`	OFF	OFF	OFF

Note: Note that only one LED should be on at any given time.

Copy and paste your code into your report, with a single screenshot of the circuit with the LEDs.

Demonstrate your project to your lecturer once completed.