Experiment No 1

Aim: Control the LED with Arduino Board and tinkercad software.

Objectives: Student should get the knowledge of Arduino Board and control of output device (LED)

Outcomes: Student will be Write program using Arduino IDE for Blinking LED

Hardware Requirements:

- 1x Breadboard

(A breadboard is a solderless device for temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate.)

- 1x Arduino Uno

(Arduino UNO is a microcontroller board based on the **ATmega328P**. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. You can tinker with your UNO without worrying too much about doing something wrong, worst case scenario you can replace the chip for a few dollars and start over again.)

- 1x LED

(A light-emitting diode is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons.

- 1x 330Ω Resistor

(A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. In electronic circuits, resistors are used to reduce current flow, adjust signal levels, to divide voltages, bias active elements, and terminate transmission lines, among other uses.)

- 2 Jumper Wires

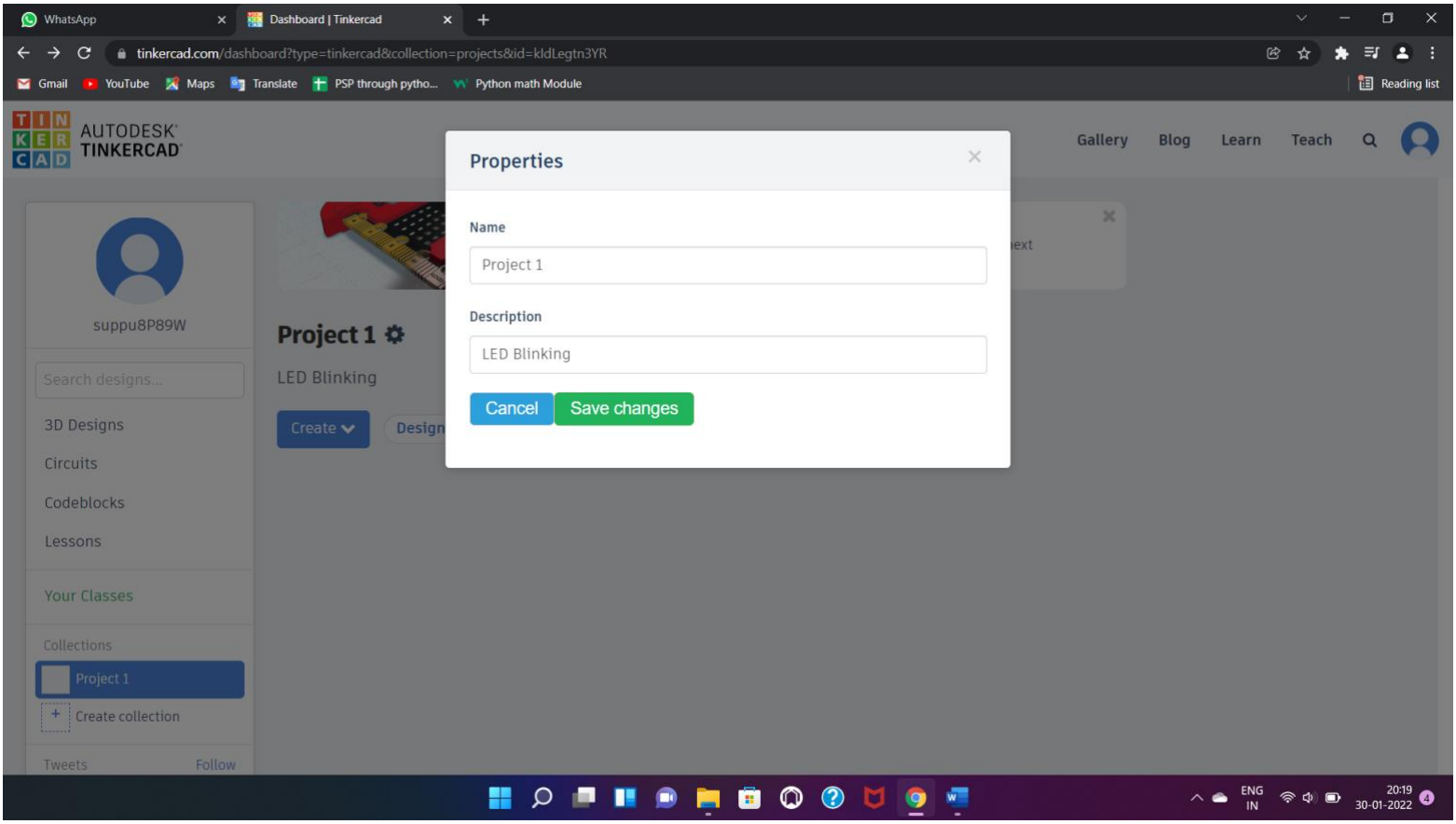
(Jumper wires are simply wires that have connector pins at each end, allowing them to be used to connect two points to each other without soldering. Jumper wires are typically used with breadboards and other prototyping tools in order to make it easy to change a circuit as needed. Fairly simple. In fact, it doesn't get much more basic than jumper wires.)

Procedure:

1.Create a new account in www.tinkercad.com or login with existing gmail account.

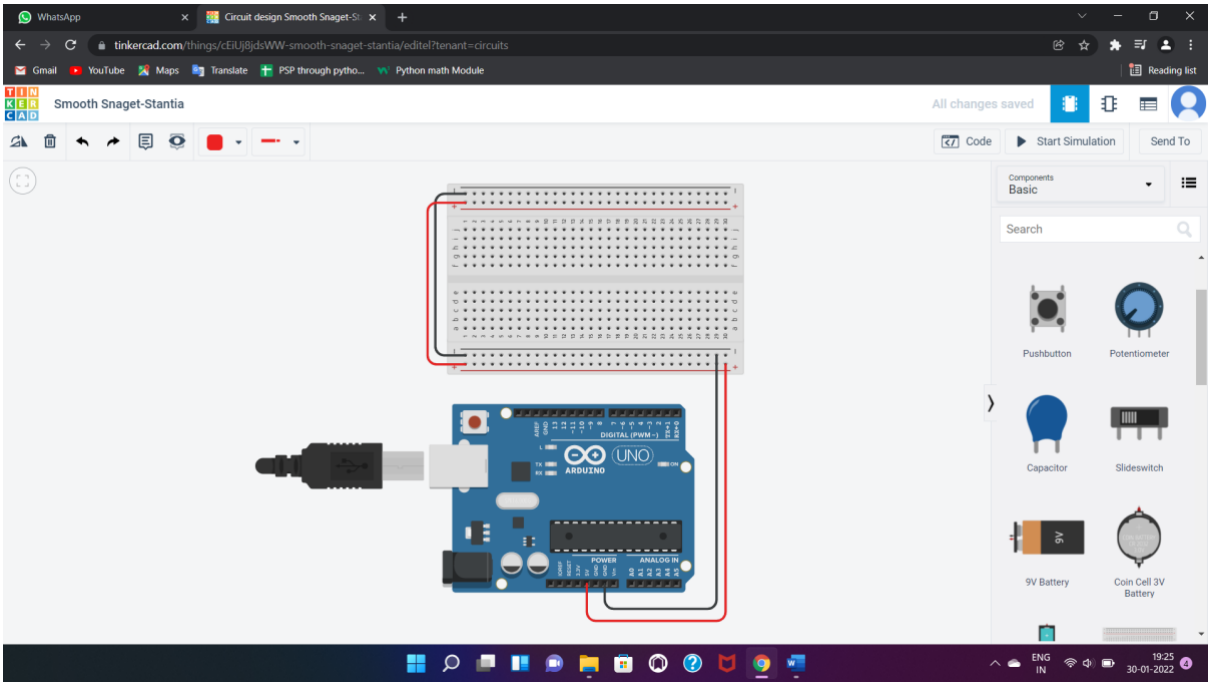
2. In the home page,click on go to create project and create a new project

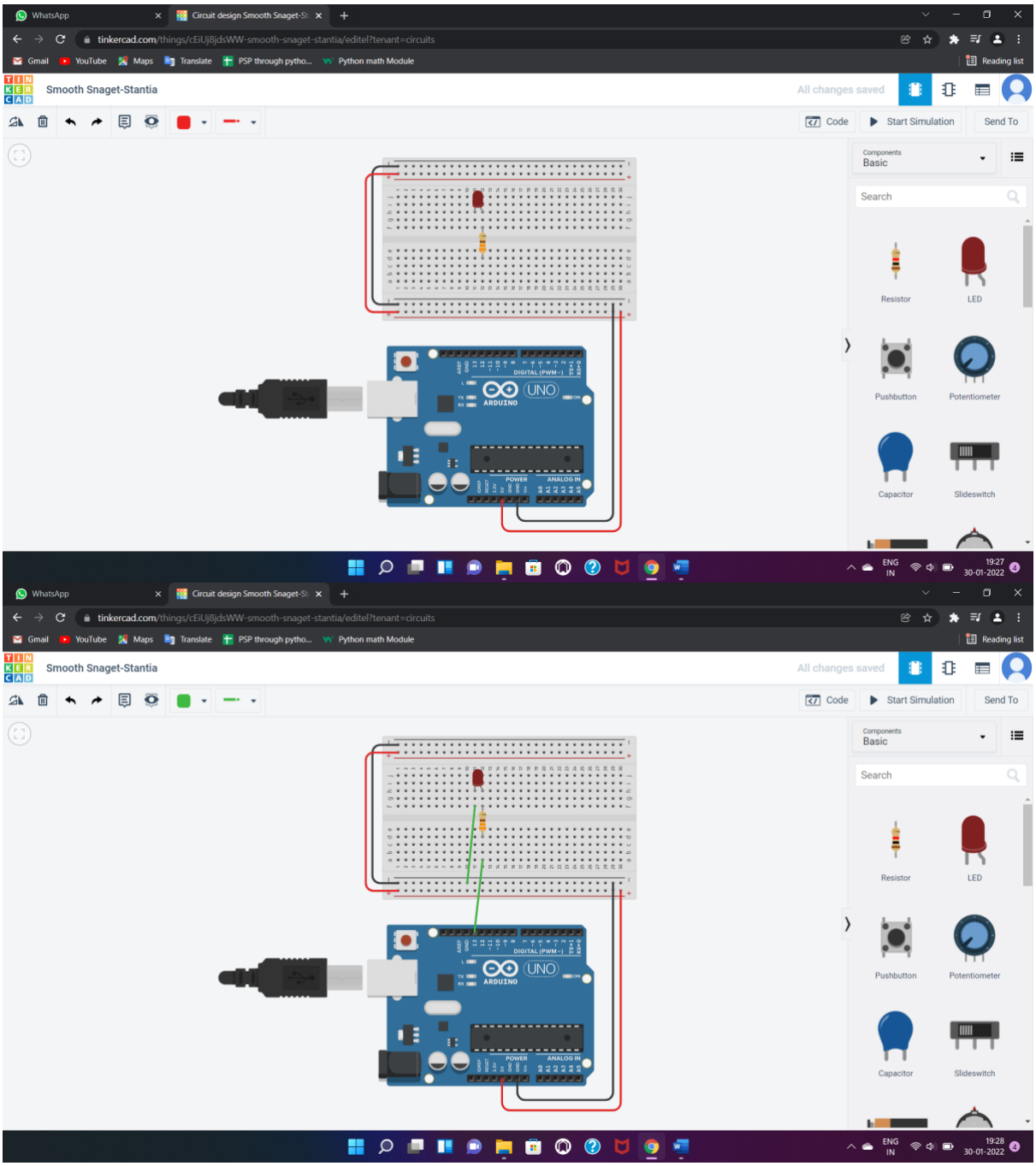
3.Opem the project1 and add a description of your project as LED blinking



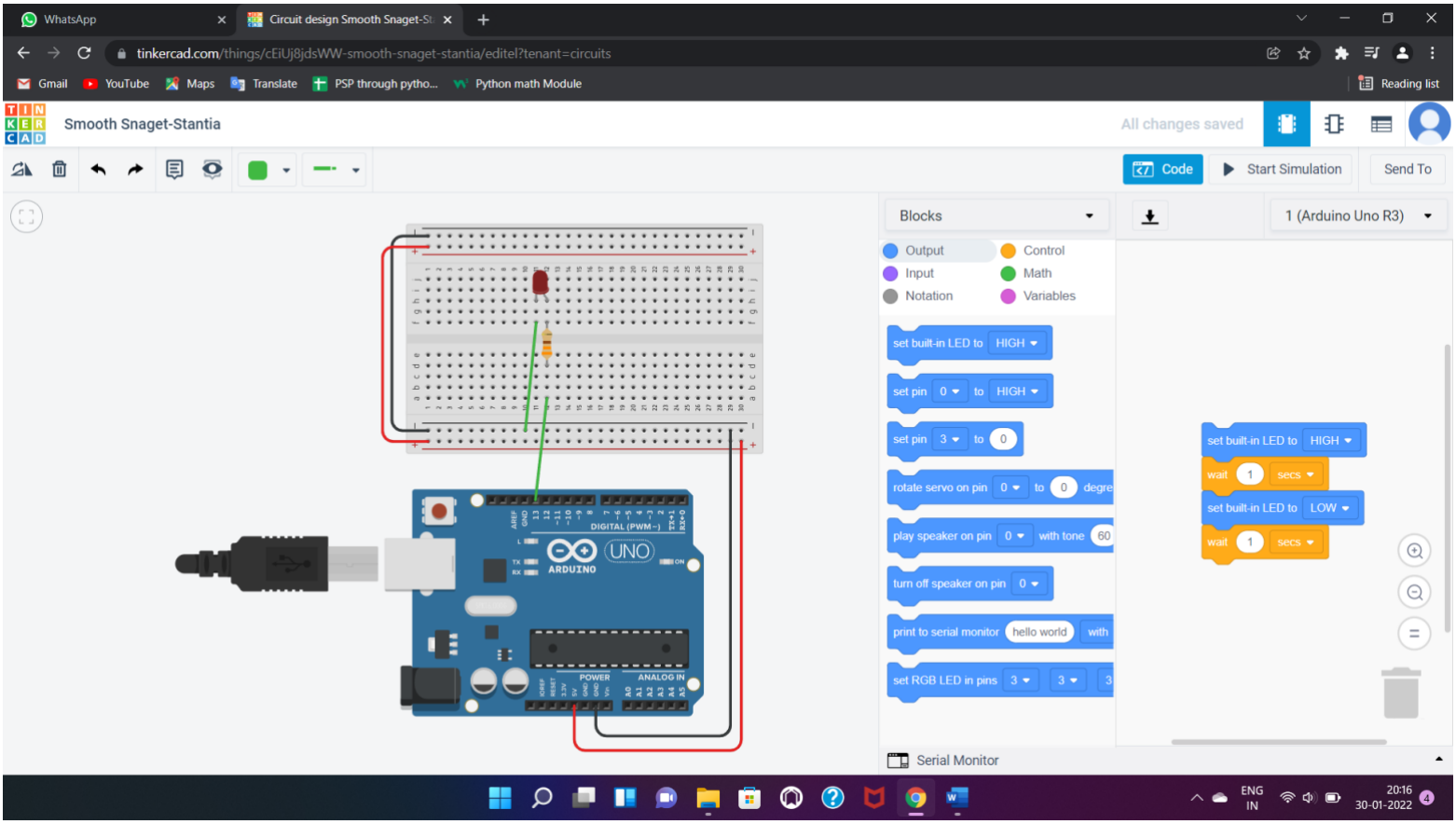
4.Go to create menu and select circuit

5.Select the Arduino and breadboard and place it in the design area.





6.Search the component LED and resistor, make connections as shown in above figures. Configure the resistor value as 330ohms.



7.Attach the LED to an output pin of the Arduino D13.

8.Once the circuit connection are ready, programming the Arduino can be done in three ways.

- Using code blocks
- Using code blocks + text programming
- With text program

Now from the code menu select blocks. The default program to blinking led with code blocks is provided. press start simulation, you will notice the blinking of LED with 1sec.

Now from the code menu select the text programming mode and place the below program to blink the led.

```
/*
  Blink
  Turns on an LED on for one second, then off for one second, repeatedly.
  This example code is in the public domain.*/

// Pin 13 has an LED connected on most Arduino boards.
// give it a name:
int led = 13;
// the setup routine runs once when you press reset:
void setup() {
  // initialize the digital pin as an output.
  pinMode(led, OUTPUT);
}
// the loop routine runs over and over again forever:
void loop() {
  digitalWrite(led, HIGH);    // turn the LED on (HIGH is the voltage level)
  delay(1000);                // wait for a second
  digitalWrite(led, LOW);     // turn the LED off by making the voltage LOW
  delay(1000);                // wait for a second

}
```

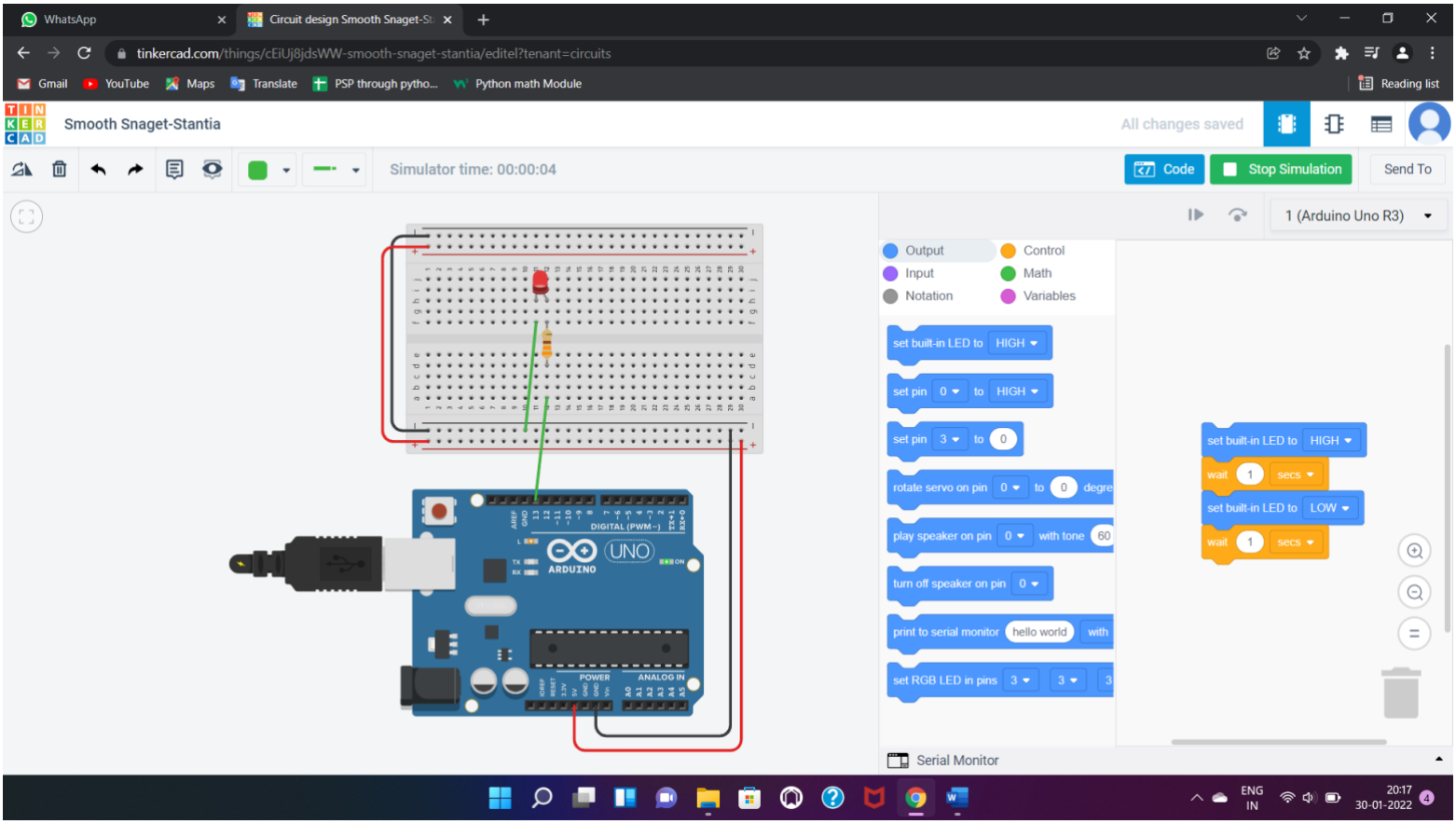
Lets try using a different pin of the Arduino – say D7. Move the red jumper lead from pin D13 to pin D7 and modify the following line near the top of the sketch:

```
int led = 13;
```

so that it reads:

```
int led = 7;
```

Upload the modified sketch to your Arduino board and the LED should still be blinking, but this time using pin D7.



The LED is blinking

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CSE B-10