INF212
ALGORITHMS AND PROGRAMMING II
LABORATORY LEAFLET
STUDENT VERSION

LABORATORY-2: For & While Loops

LABORATORY 2

Task	Statement	Explanation
1	while	Infinite loop and break command
2	for/while	Calculate factorial of a given number
3	for	Multiplication table of a number entered by user from 0 to 9
4	while	Calculating the divisors and sum of the divisors of a number

Task 1: Find the maximum number entered by user. (Request number until user enters 0).

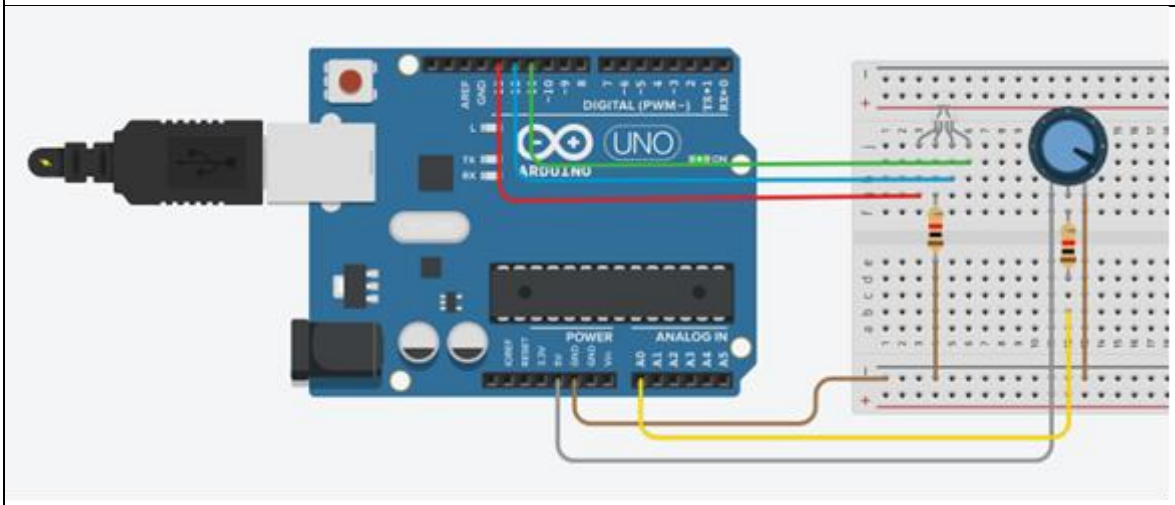
Task 2.a: Calculate factorial of a given number (using while loop).

Task 2.b: Calculate factorial of a given number (using for loop).

Task 3: Write a program which prints the multiplication table of a number entered by user from 0 to 9.

Task 4: Write a program which prints the divisors and sum of the divisors of a number given by user. Test your program for 12.

Arduino Experiment-1
if, nested if/else, switch case statements for RGB LED

CIRCUIT COMPONENTS
Arduino board , RGB LED, Potentiometer, Breadboard, 1 kOhm Resistors x2
Information about components
RGB LED looks like a regular LED, however, there are three LEDs inside the usual LED package, one red, one green and one blue. By controlling the brightness of each of the individual LEDs you can mix the colors. A potentiometer is a simple knob that provides a variable resistance, which we can read into the Arduino board as an analog value. By turning the shaft of the potentiometer, we change the amount of resistance on either side of the wiper which is connected to the center pin of the potentiometer. When the shaft is turned all the way in one direction, there are 0 volts going to the pin, and we read 0. When the shaft is turned all the way in the other direction, there are 5 volts going to the pin and we read 1023. analogRead() returns a number between 0 and 1023 that is proportional to the amount of voltage being applied to the pin. Here, the value of potentiometer controls the rate at which an LED blinks.
CIRCUIT DIAGRAM

Instructions
1. Arduino is explained to students. (information is available on “Arduino” document) 2. Experiment will be done using **CODES (NOT BLOCKS)** on Tinkercad (information is available on “how to use tinkercad” document) 3. Students will repeat the experiment with codes available on their leaflet. 4. Students are asked to write and run the same code using else/if statement. 5. Students are asked to write and run the same code using switch case statement. 6. Arduino web editor will be explained to students (information is available on “how to use Arduino Web Editor” document) 7. Copy or rewrite codes on Arduino web editor and show how it works with your Arduino circuit.

Experiment 1.1: ARDUINO CODE USING IF STATEMENT:

```
//codes for if statement

#define RedLed 13  // define LED pins
#define BlueLed 12
#define GreenLed 11

void setup() {

  // put your setup code here.

  pinMode(RedLed, OUTPUT);  //sets RGB pins as output
  pinMode(BlueLed, OUTPUT);
  pinMode(GreenLed, OUTPUT);

  digitalWrite(RedLed,LOW);  //Turn off RGB Led
  digitalWrite(BlueLed,LOW);
  digitalWrite(GreenLed,LOW);

  analogReference(DEFAULT); //Set analog reference

}
void loop() {

  // put your main code here, to run repeatedly.

  int val; //value of potentiometer is between 0 and 1023. (Because
arduino has 10 bit analog converter)

  val = analogRead(A0); //reads the value of potentiometer.

  if(val<300){
   //if val is smaller than 300, RGB led is red
   digitalWrite(RedLed,HIGH);
   digitalWrite(BlueLed,LOW);
   digitalWrite(GreenLed,LOW);
  }


  if(val>300 && val<800){
   //if val between 300 and 800, RGB led is blue
   digitalWrite(RedLed,LOW);
   digitalWrite(BlueLed,HIGH);
   digitalWrite(GreenLed,LOW);
  }

  if(val>800){
   //if val is bigger than 800, RGB led is green
   digitalWrite(RedLed,LOW);
   digitalWrite(BlueLed,LOW);
   digitalWrite(GreenLed,HIGH);
  }

 delay(10); // Delay a little bit to improve simulation performance
}
```

Experiment 1.2: ARDUINO CODE USING ELSE IF STATEMENT:

Experiment 1.3: ARDUINO CODE USING SWITCH CASE STATEMENT:

ABOUT LABORATORY LEAFLET

This leaflet is prepared for the INF211 Algorithms and Programming I course laboratory given in the Department of Electronic Engineering of Gebze Technical University.

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