WORLD PROBLEM IN ROBOTICS

1. Your best friend is planning a housewarming party and want to add a robotic touch to the decorations. He decides to use an LED chasing effect on the display board to simulate motion and catch attention. As a robotics student he needs you to:
   I. Provide him with the circuit design which will make four LEDs chase each other at one second interval.
   II. Write an Arduino code to control the system.

2. The head teacher of Majesty International Academy wants to design a counting device which will teach primary one pupil how to count from zero (0) to nine (9), she requests you as robotics student to:
   i. Provide her with circuit design which will make a seven-segment display to count from zero (0) to nine (9) at one second interval.
   ii. Write the Arduino code which will control the system

   Solution

   1i. LED pin configuration

Arduino pin	LED pin
13	Led1 anode
12	Led2 anode
11	Led3 anode
10	Led4 anode

All LED cathode is connected to ground.

1ii. The system control code

```
unsigned int LEDPIN[] = {13, 12, 11, 10};
```

```
void setup() {
for(int I = 0; 1 < 4; I++){
pinMode(LEDPIN[i], OUTPUT);
}
}

void loop() {
for(int I = 0; I < 4; I++){
digitalWrite(LEDPIN[i], HIGH);
delay(1000);
digitalWrite(LEDPIN[I], LOW);
}
}
```

2i Seven segment display pin configuration

Arduino	Seven segment
13	a
12	b
11	c
10	d
9	e
8	f
7	g
GND	Common Pin

2ii the system control code

```
unsigned int segpin[7] = {13, 12, 11, 10, 9, 8, 7};
  const byte digits[10][7] = {
```

```
   //a,b,c,d,e,f,g
    {1,1,1,1,1,1,0},
    {0,1,1,0,0,0,0},
    {1,1,0,1,1,0,1},
    {1,1,1,1,0,0,1},
    {0,1,1,0,0,1,1},
    {1,0,1,1,0,1,1},
    {1,0,1,1,1,1,1},
    {1,1,1,0,0,0,0},
    {1,1,1,1,1,1,0},
    {1,1,1,1,0,1,1},
  };
void setup() {
  // put your setup code here, to run once:
for(int i=0; i<7; i++){
  pinMode(segpin[i], OUTPUT);
}
}

void loop() {
  // put your main code here, to run repeatedly:
  for(int y=0; y<10; y++){
displayDigit(y);
delay(1000);
  }
}
 void displayDigit(int digit){
  for(int seg = 0; seg < 7; seg++){
```

```
        digitalWrite(segpin[seg], digits[digit][seg]);
      }
    }
```

Assignment

1. Your best friend is planning a housewarming party and want to add a robotic touch to the decorations. He decides to use an LED chasing effect on the display board to simulate motion and catch attention. As a robotics student he needs you to:
   i. Provide him with the circuit design which will make eight LEDs chase each other at one second interval.
   ii. Write an Arduino code to control the system.

2. The head teacher of Majesty International Academy wants to design a counting device which will teach primary one pupil how to count from zero (0) to nine (9) and A, b, C, D, E, F, she requests you as robotics student to:
   i. Provide her with circuit design which will make a seven-segment display to count from zero (0) to nine (9) and display A, b, C, D, E, F, at one second interval.
   ii. Write the Arduino code which will control the system