1) Biman Bangladesh operates a flight from Dhaka to London. Usually, the flight from London starts at 8pm local time (after the sun has set). Even though the commercial aircrafts are painted white, it doesn't help when it comes to other aircrafts' visibility. So, to prevent accidents/collisions, aircrafts usually mount 1 lights at the bottom surface of the body, 2 lights on 2 wings (left and right) and 1 light on the tail and, these 4 lights flash together periodically. Biman's flight experienced an issue with the program controlling these lights and upon investigating; it was found that the system is built with an Arduino Uno at the heart. Interestingly, the Arduino was already set up to consume as little power as possible not to strain the aircraft's fuel efficiency. Now, prepare a program in Arduino Uno platform to control the 4 lights mounted on the aircraft's body so that all the lights flash together every 2s.

Solution:

```
#define Led1 3
#define Led2 4
#define Led3 5
#define Led4 6

void setup() {
 pinMode(Led1, OUTPUT);
 pinMode(Led2, OUTPUT);
 pinMode(Led3, OUTPUT);
 pinMode(Led4, OUTPUT);
}

void loop() {
digitalWrite(Led1, !digitalRead(Led1));
digitalWrite(Led2, !digitalRead(Led2));
digitalWrite(Led3, !digitalRead(Led3));
digitalWrite(Led4, !digitalRead(Led4));

delay(2000);
}
```

3) The steamer ‘Ostrich’ ferries people between Dhaka and Barisal. Ostrich usually starts from Dhaka around 7.30pm (evening/night depending on the season). At night, the visibility is usually very low. So, the steamers/launches usually have a flashing signal light on the roof. On top of that, the master of the steamer also honks the horn when necessary. This signal light and the horn are both controlled by an Arduino Uno. The signal light flashes every 4s whereas the horn is sounded whenever the master presses the horn switch. The horn switch already has a small RC circuit attached to it to counter bouncing. Now, prepare a program in Arduino Uno to control the signal light and the horn considering the information mentioned above.

Solution:

```
#define Led1 3
#define switch1 2
//define the delays for LED
int LED_blink = 4000;

//define variable for switch press
int switch_read;    //defining a variable which will read
the state of the switch

int delay_timer (int miliseconds)
{
  int count = 0;
  while(1)
  {
    if(TCNT0 >= 16)  // Checking if 1 milisecond has passed
      {
        TCNT0=0;
        count++;
        if (count == miliseconds) //checking if required
miliseconds delay has passed
        {
            count=0;
            break; // exits the loop
        }
      }
  }
  return 0;
```

```
}


void setup() {
 pinMode(Led1, OUTPUT);
 pinMode(switch1, INPUT);

     //set up timer
    TCCR0A = 0b00000000;
    TCCR0B = 0b00000101; //setting prescaler for timer clock
    TCNT0=0;

}

void loop() {

digitalWrite(Led1, !digitalRead(Led1));
delay_timer(LED_blink);

switch_read=digitalRead(switch1);
  if (switch_read==LOW){
    ;play HORN
  }


}
```