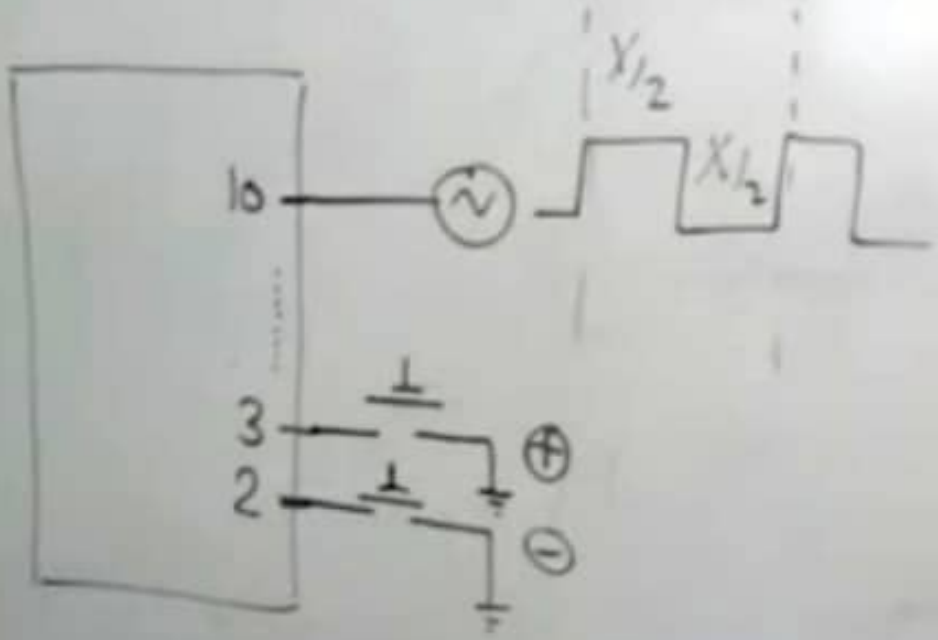
Short2

Q2] Develop an embedded system that produces continous pulses with duration X seconds & duty cycle 50%. X could take values from 1 → 10 seconds. Use Two push btns to increase or decrease the pulse speed.



Solve with & without interrupts

② Without Interrupts

```
int plusSwitch = 3, minusSwitch = 2;
int outPin = 13; int X = 1;
void Setup()
{
  pinMode (outPin, OUTPUT);
  pinMode (plusSwitch, INPUT);
  pinMode (minusSwitch, INPUT);
  digitalWrite (plusSwitch, HIGH);
  digitalWrite (minusSwitch, HIGH);
}
```

```
void loop()
{
  if (digitalRead (plusSwitch) == 0)
  {
    X++;
    if (X > 10) X = 10;
  }
  if (digitalRead (minusSwitch) == 0)
  {
    X--;
    if (X < 1) X = 1;
  }
  digitalWrite (outPin, HIGH);
  delay (X * 1000 / 2);
  digitalWrite (outPin, LOW);
  delay (X * 1000 / 2);
}
```

With Interrupts

```
void Setup()
{
    —
    —
    —    } same
    —      as before

  interrupts();                LOW
  attachInterrupts(0, minus, FALLING);
  attach Interrupts (1, plus, FALLING);
}
void Loop()
{
    digitalWrite(outPin, HIGH);
    delay(X*1000/2);
    digitalWrite(outPin, LOW);
    delay(X*1000/2);
}
```

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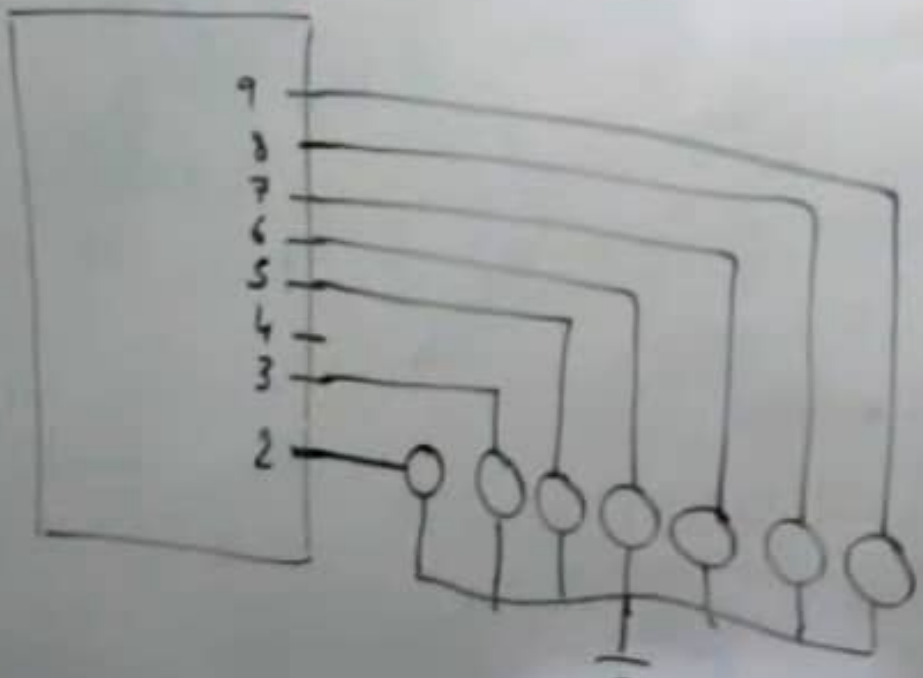
```
void plus()
  {
     X++;
     if(X>10) X=10;
  }

void minus()
  {
     X--;
     if(X<1) X=1;
  }
```

Short2

Q2) Develop an embedded system that produce an 8 bit binary value that count from 0 → 255. Each count should last for 1 second



Solve with & without Timers

With Timers

```
#include<MsTimer2.h>
int leds[8]={9,8,7,6,5,4,3,2}
int count=0

void light()
{
    for(int i=0; i<8; i++)
    {
        if(count&(1<<i))
            digitalWrite(leds[i],HIGH);
        else
            digitalWrite(leds[i], LOW);
    }
    count++;
    if(count>255) count=0;
}
```

```
void Se
{ for(
    MST
    MST
}
void loo
{
}
```

```
void Setup()
{  for (int i=0; i<8; i++)
        pinMode(leds[i], OUTPUT);

   MsTimers2::set(1000, light);
   MsTimers2::start();
}

void loop
{

}
```

```
int
int
int x;
Void Set
{
```

++)
[i], OUTPUT);
, light);

24 Develop an embedded system that reads 6 analog inputs and produce a pulse with duration equeals to the read value. Use a push-button to switch between the values.

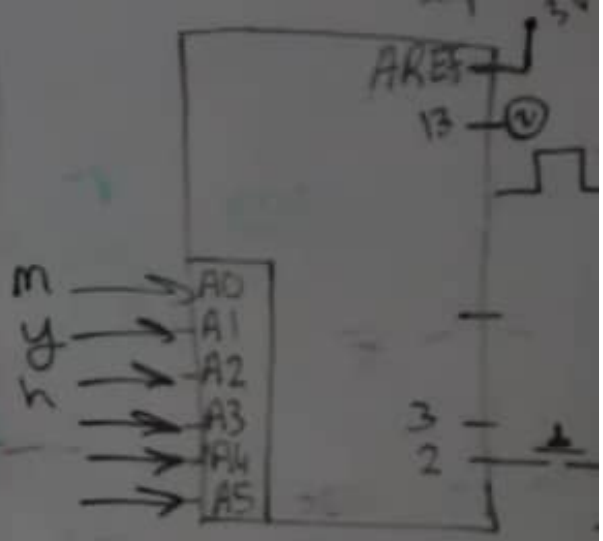
```
int Switch=2; int mode=0;
int inputPins[6]={0,1,2,3,4,5};
int x;
void Setup()
{
  pinMode(outPin, OUTPUT);
  pinMode(switch, INPUT);
  digitalWrite(switch, HIGH);
  interrupts();

  attachInterrupts(0, pulse, FALLING);
}
```

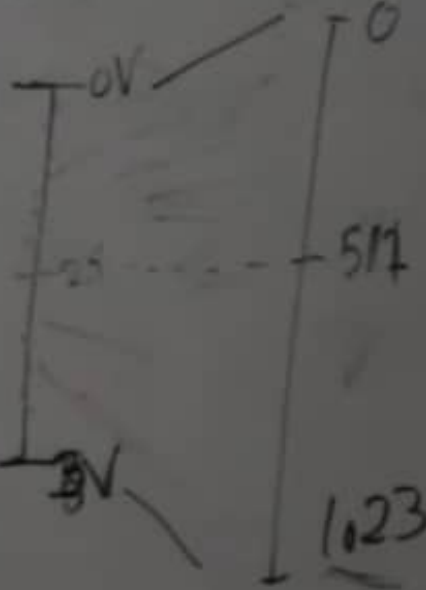
```
Void pulse()
{
  mode++;
  if(mode>5)
      mode=0;
}
```

```
bid loop()
{ x= analogRead(inputPins[mode]);
  digitalWrite(outPin, HIGH);
  delay(x/2);
  digitalWrite(outPin, LOW);
  delay(x/2);
}
```

111 = 7

$2^3 - 1$





```
int leds[3]={5,6,7};

void setup()
{
  for(int i=0; i<3; i++)
  {
    pinMode(leds[i], OUTPUT);
  }
}

void loop()
{
  int X0=analogRead(0);
  int X1= - - - - (1);
  int X2= - - - - (2);
  if(X0>X1 && X0>X2) digitalWrite(leds[0],
```

```
void IncreaseX
{ if(X==
  else X+
}

void Loop
{

int du

int dt
du
```