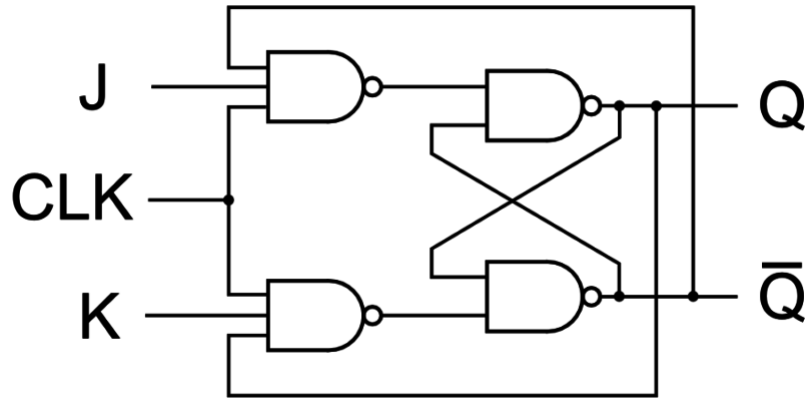# ASSIGNMENT

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Figure 1: JK flipflop circuit

1 QUESTION

1.1 DESIGN A 4 BIT UP COUNTER WITH JK FLIPFLOP AND DISPLAY THE OUTPUT ON SSD USING 7447 IC

LOGIC FUNCTION

```
int jklogic(int J,int K)
{
  int Q=0,NQ=1,CLK=1,s,r;
  s=!(J&&CLK&&NQ);
  r=!(K&&CLK&&Q);
  Q=!(s&&NQ);
  NQ=!(r&&Q);
  return Q;
}
```
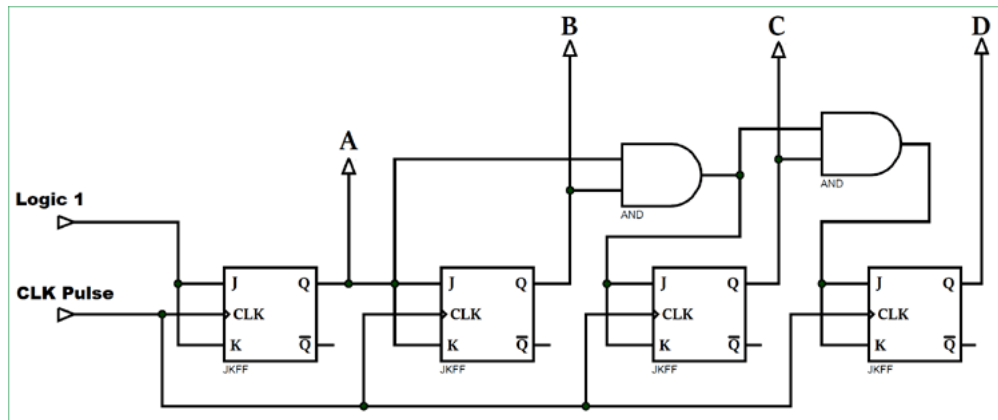
Figure 2: Counter Circuit

PROGRAM

```
#include"Arduino.h"
#include"jklogic.h"
int A,B,C,D,E,F,G,H;
void setup()
{
  pinMode(5,OUTPUT);
  pinMode(6,OUTPUT);
  pinMode(7,OUTPUT);
  pinMode(8,OUTPUT);
  Serial.begin(9600);
}
void loop()
{
A=0;
B=0;
C=0;
D=0;
for( int i=1;i<=10;i++)
{
E=jklogic(A,!A);
F=jklogic(B,!B);
G=jklogic(C,!C);
H=jklogic(D,!D);
Serial.println(H);
digitalWrite(5,H);
digitalWrite(6,G);
digitalWrite(7,F);
```

3

```
digitalWrite(8,E);
delay(1000);
if(i%8==0)
A=!A;

if(i%4==0)
B=!B;

if(i%2==0)
C=!C;

D=!D;
}
}
```

1.2 DESIGN A 4 BIT DOWN COUNTER WITH JK FLIPFLOP AND DISPLAY THE OUTPUT ON SSD USING 7447 IC

PROGRAM

```
#include"Arduino.h"
#include"jklogic.h"
int A,B,C,D,E,F,G,H;
void setup()
{
  pinMode(5,OUTPUT);
  pinMode(6,OUTPUT);
  pinMode(7,OUTPUT);
  pinMode(8,OUTPUT);
  Serial.begin(9600);
}
void loop()
{
A=1;
B=1;
C=1;
D=1;
for( int i=1;i<=16;i++)
{
  if (i>6)
  {
E=jklogic(A,!A);
F=jklogic(B,!B);
G=jklogic(C,!C);
H=jklogic(D,!D);
Serial.println(H);
digitalWrite(5,H);
digitalWrite(6,G);
digitalWrite(7,F);
digitalWrite(8,E);
delay(1000);
  }
if(i%8==0)
A=!A;

if(i%4==0)
B=!B;

if(i%2==0)
C=!C;
```

```
D=!D;
}
}
```