**IDE ASSIGNMENT**

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FWC22136 IITH - Future Wireless Communications

# Contents



# 1 Problem

(GATE2019-QP-EE)
Q.35 The output expression for the Karnaugh map shown below is

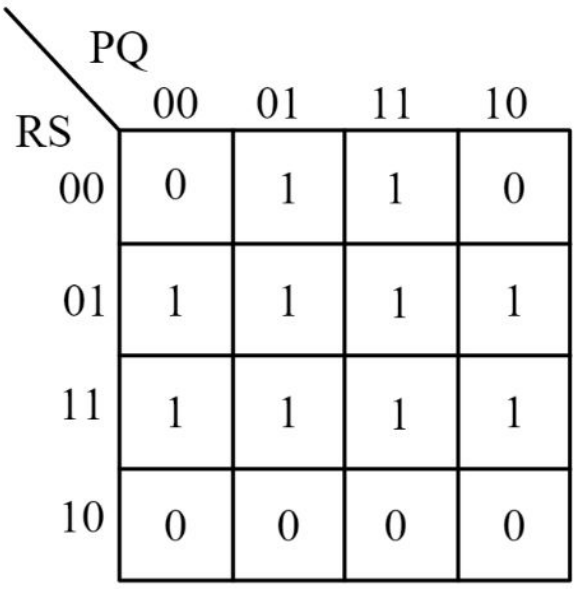


Figure 1: K-MAP

1. QR'+S
2. QR+S
3. QR'+S'
4. QR+S'

# 2 Components

| Components | Value | Quantity |
|---|---|---|
| Breadboard | | 1 |
| Arduino | uno | 1 |
| Jumper wires | | 4 |

### 2.1 Arduino

The Arduino Uno has some ground pins.analog input pins A0-A3 and digial pins D1-D13 that can be used for both input as well as output. It also has two powe pins that can generate 3.3V and 5V. In the following exercise,we use digital pins,GND and 5V

## 3 Implementation

### 3.1 Truth table

| A | B | X=A'+B' |
|---|---|---|
| 0 | 0 | 1 |
| 0 | 1 | 0 |
| 1 | 0 | 0 |
| 1 | 1 | 0 |

### 3.2 K-MAP

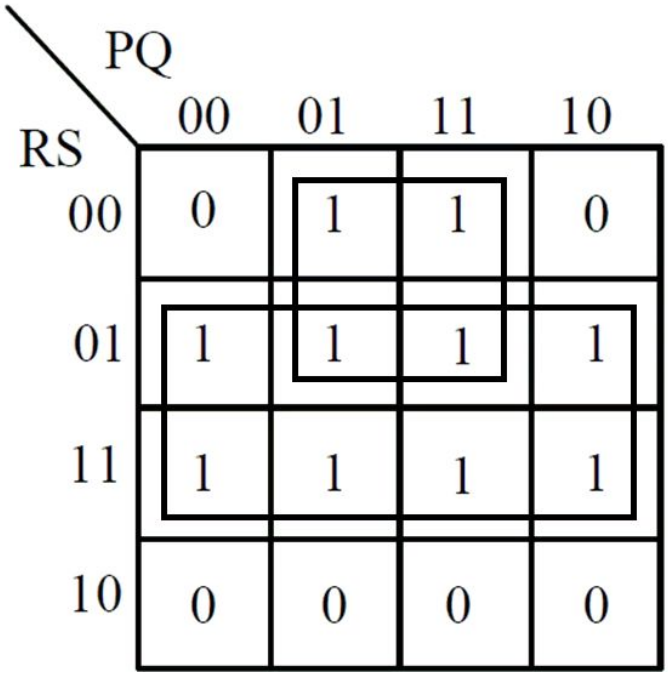


Figure 2: K-MAP

### 3.3 Boolean Equation

$$
\begin{aligned}
&F = R'SP'(Q'+Q) + R'SP(Q'+Q) + R'S'Q(P'+P) + R'SQ(P'+P) + RSP'(Q'+Q) + RSP(Q'+Q)\\
&F = R'S(P'+P) + R'Q(S'+S) + RS(P'+P)\\
&F = S(R'+R) + R'Q\\
&F = S + QR'
\end{aligned}
\tag{1}
$$

## 4 Hardware

1. Connect one end of jumper wire to the ground pin on the Arduino no and other end to the breadboard's ground rail(-)
2. Connect the one terminal of jumper wire to the input pins of Arduino and other end to the positive rail(+) on the breadboard
3. Connect one end of another jumper wire to the inpur pin of Arduino and other end to the positive to rail(+)

4. Enable the power supply to breadboard from arduino by connecting one end of jumper wire to the power pin of arduino and other end to the positive rail on the breadboard

# 5 Conclusion

Hence we have implemented the NOR gate by the code-givien below
https://github.com/kartheekbogolu/cbse-10/tree/main/codes