

PRESENTATION

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INTERN

SOP is a method of describing a Boolean expression using a set of minterms or product terms.

POS is a method of describing a Boolean expression using a set of max terms or sum terms.

Hence, these definitions themselves contain the main difference between SOP and POS.

Question

For the Boolean expression

$$f = a'b'c' + a'bc' + ab'c' + abc + abc'$$

the minimized Product of Sum (PoS)
expression is

- a) $f = (b + c')(a + c')$
- b) $f = (b' + c)(a' + c)$
- c) $f = (b' + c)(a + c')$
- d) $f = c' + abc$

K-Map for SOP

| | $b'c'$ | $b'c$ | bc | bc' |
|------|--------|-------|------|-------|
| a' | 1 | 0 | 0 | 1 |
| a | 1 | 0 | 1 | 1 |

After mapping

| | $b'c'$ | $b'c$ | bc | bc' |
|------|--------|-------|------|-------|
| a' | 1 | 0 | 0 | 1 |
| a | 1 | 0 | 1 | 1 |

Reduced SOP expression is

$$f = c' + ab$$

Hence the POS form is

$$z = (a' + c)(b' + c)$$

Arduino Code

```
int a,b,c;
int A,B,C,D,f;
void setup(){

pinMode(9,INPUT);
pinMode(8,INPUT);
pinMode(7,INPUT);
pinMode(2,OUTPUT);
pinMode(3,OUTPUT);
pinMode(4,OUTPUT);
pinMode(5,OUTPUT);
pinMode(6,OUTPUT);
}

void loop(){
a=digitalRead(9);
b=digitalRead(8);

c=digitalRead(7);
f=(!a&&!b&&!c)||(!ab!c)||!(a&&!b
&&!c)||!(a&&b&&c)||!(a&&b&&!c);
A=(b||!c)&&(a||!c);
B=(!b||c)&&(!a||c);
C=(!b||c)&&(a||!c);
D=!c||(a&&b&&c);
digitalWrite(2,f);
digitalWrite(3,A);
digitalWrite(4,B);
digitalWrite(5,C);
digitalWrite(6,D);
}
```