1. Simplify the following Boolean functions using K-map.
   i. $F(x,y) = \sum(0,1,2,3)$
   ii. $F(x,y) = \sum(0,1,2)$
   iii. $F(a,b) = \sum(0,1)$
   iv. $F(y_1,y_2) = \sum(0,3)$
   v. $F(x_1,y_1) = \sum(1)$
   vi. $F(a,b) = \sum(1,2)$
2. Simplify the following Boolean functions using K-map.
   i. $F(x,y,z) = \sum(3,4,6,7)$
   ii. $F(a,b,c) = \sum(3,5,6,7)$
   iii. $F(x,y,z) = \sum(1,2,3,7)$
   iv. $F(x,y,z) = \sum(0,2,4,6)$
   v. $F(x,y,z) = \sum(0,1,2,4,6)$
   vi. $F(x_1,x_2,x_3) = \sum(1,2,4,6)$
   vii. $F(a,b,c) = \sum(0,1,2,3,4,5,6,7)$

3. Simplify the following Boolean functions using K-map.
   i. $F(w,x,y,z) = \sum(2,3,12,13,14,15)$
   ii. $F(a,b,c,d) = \sum(3,7,11,13,14)$
   iii. $F(w,x,y,z) = \sum(2,3,10,11,12,13,14,15)$
   iv. $F(a,b,c,d) = \sum(0,2,4,5,6,7,8,10,13,15)$
   v. $F(a,b,c,d) = \sum(0,1,2,4,5,7,11,15)$
   vi. $F(w,x,y,z) = \sum(0,1,2,4,5,6,8,9,12,13,14)$
4. Simplify the following Boolean functions using K-map and represent it in POS.
   i. $F(w,x,y,z) = \sum(1,5,9,10,11,13,14,15)$
   ii. $F(w,x,y,z) = \sum(8,9,10,11,12,13,14,15)$
   iii. $F(w,x,y,z) = \sum(0,2,3,4,5,6,7,8,10,11,13,15)$
   iv. $F(w,x,y,z) = \sum(0,2,5,7,8,10,13,15)$
   v. $F(w,x,y,z) = \sum(0,1,2,3,6,8,9,10,11,12)$
   vi. $F(w,x,y,z) = \sum(3,6,8,9,11,12,13,14)$