**Assignment4.8**

**Problem Statement:**

In one state, 52% of the voters are Republicans, and 48% are Democrats. In a second state, 47% of the voters are Republicans, and 53% are Democrats. Suppose a simple random sample of 100 voters are surveyed from each state.

What is the probability that the survey will show a greater percentage of Republican voters in the second state than in the first state?**Answer:**

P1(Probability of republicans in state1)=0.52 1-P1=0.47

P2(Probability of republicans in state2)=0.47 1-P2=0.53

n1P1 = 100 \* 0.52 = 52

n1(1 - P1) = 100 \* 0.48 = 48

n2P2 = 100 \* 0.47 = 47

n2(1 - P2) = 100 \* 0.53 = 53

The mean of the difference in sample proportions:



P1 - P2 = 0.52 - 0.47 = **0.05.**The standard deviation of the difference.



σd =   
 =  
 = =

= **0.0706**

P(p1<p2)=P(p1-p2)<0,to find the probability transform p1-p2 into a z-score

zp1 - p2 = (x - μp1 - p2 ) / σd = = (0 - 0.05)/0.0706 = -0.7082

probability of z score is -0.7082 or less is 0.24.

Therefore, the probability that the survey will show a greater percentage of Republican voters in the second state than in the first state is 0.24 i.e.(24%).