In [1]:

```
import scipy.stats as sts
from scipy.stats import norm
import math
import numpy as np
```

In [2]:

```
# 1

p_mean = 100
p_std = 15
n = 36
sample_mean = 108
alpha = 0.05

SE = p_std/n**0.5
print(f"SE: {SE}")
z = (sample_mean-p_mean)/SE
print(f"z_score: {z}")
# From z- table, p(3.20) = 0.9993
# The probability of having value less than 108 is 0.9993 and more than or equals to 108 is (1-0.9993)=0.0007.
# The probability of having mean glucose level more than or equals to 108  is 0.0007 which is  less than 0.05
# Conclusion- reject the Null hypothesis, there is raw cornstarch effect
```

```
SE: 2.5
z_score: 3.2
```

In [5]:

```
# 2

n1 = 100
n2 = 100
R1 = 0.52
D1 = 0.48
R2 = 0.47
D2 = 0.53

mu = R1 - R2
print(f"mu: {mu}")
std = math.sqrt(((R1 * D1 ) / n1) + ((R2 * D2) /n2))
print(f"std: {std}")

# finding the probability that R1 - R2 < 0
x = 0
# To find this probability, we need to transform the random variable (R1 - R2) into a z-score
z_R1_R2 = ( x - mu)/std
print(f"z_p1_p2 : {z_R1_R2}")

# From Z table, probability of a z-score being -0.7082 or less is 0.24
# 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
```

```
mu: 0.050000000000000044
std: 0.07061869440877536
z_p1_p2 : -0.7080278164104213
```

In [7]:

```
# 3

x = 1100
mu = 1026
sd = 209
z = ( x - mu)/sd
print("z Score : ",z)
print("My Score is in the range {} - {}  with a  zscore {:.2f}".format(mu - sd,mu + sd,z))
```

```
z Score :  0.35406698564593303
My Score is in the range 817 - 1235  with a  zscore 0.35
```

In [ ]: