In [1]:
```
# Blood glucose levels for obese patients have a mean of 100 with a standard devia
```

In [2]:
```
import math

no_of_sample = 36
sample_mean = 108
population_mean = 100
population_sigma = 15

# Step-1: State the hypothesis. The population mean is 100.
# H0:μ=100 ==> null hypothesis
# H1:≠100 ==> Research hypothesis / Alternate hypothesis

# Step-2: Set up the significance level. It is not given in the problem so let's a

# This 5% is called Significance Level also known as alpha level (symbolized as α)
# It means that if random chance probability is less than 5% then we can conclude
# two different population.
# (1 - significance level) is also known as Confidence level
# i.e. we can say that iam 95% confident that it is not driven by randomness.

# Step-3: Calculate Z score
z = (sample_mean - population_mean) / (population_sigma / math.sqrt(no_of_sample))
print("Z score :",z)

# By looking at z-table and p-value associated with 3.20 is 0.9993
# The probability of having value less than 108 is 0.9993 and more than or equals

# Step-4: Since the probability of having mean glucose level more than or equals t
# So we will reject the Null hypothesis i.e. there is raw cornstarch  effect.
```

```
Z score : 3.2
```

In [3]:
```
is the probability that the survey will show a greater percentage of Republican vote
```

In [5]:
```
# Let:

#P1 = The proportion of Republican Voters in the first state
#P2 = The proportion of Republican Voters in the second state
#p1 = The proportion of Republican Voters in the sample from the first state
#p2 = The proportion of Republican Voters in the sample from the second state

# The number of Voters sampled from the first state (n1) = 100
n1 = 100

# The number of Voters sampled from the second state (n2) = 100
n2 = 100

P1 = 0.52
#(1 - P1) = Q1
Q1 = 0.48
P2 = 0.47
#(1 - P2) = Q2
Q2 = 0.53

# The mean of the difference in sample proportions .i.e Expected Value E[p1 -p2] =
mu = P1 - P2

# The standard deviation of the difference (std)
std = math.sqrt(((P1 * Q1) / n1) + ((P2 * Q2) / n2))
print("Mu : ",mu,"Std : ", std)

# This problem requires us to find the probability that p1 is less than p2.
# This is eqivalent to finding the probability that p1 - p2 < 0.
x = 0
# To find this probability, we need to transform the random variable (p1 - p2) int
Z_p1_p2 = (x - mu) / std

print("Z_score(p1,p2) : ", Z_p1_p2)

# From Z table we find that the probability of a z-score being -0.7082 or less is

# Therefore, the probability that the survey will show a greater percentage of Rep
# in the first state is 0.24.
```

```
Mu :  0.05000000000000044 Std :  0.07061869440877536
Z_score(p1,p2) :  -0.7080278164104213
```

In [6]:
```
ore 1100. The mean score for the SAT is 1026 and the standard deviation is 209. How
```

In [7]:

```
# The z score tells you how many standard deviations from the mean your score is
x = 1100
mu = 1026 # Population Mean
sd = 209 # population standard deviation
z = (x - mu) / sd
print("Z Score : ", z)
# The above calculation shows that my score is 0.35 standard deviations above the
print("My score is in the range {} - {} with a zscore {:.2f}".format(mu - sd, mu +
```

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

In [ ]: