Examples

CIND 123

Q1

- A computer crashes once every 2 days on average. What is the probability of there being 2 crashes in one week?

- What is Lambda?

Q2

- Components are packed in boxes of 20. The probability of a component being defective is 0.1.

- What is the probability of a box containing 2 defective components?

- What is the probability of a box containing 11 non-defective components?

- P(12<=X<=15) p=0.9

Q3

- Find the height of the probability distribution curve the student arriving in 28.5 minutes, mean=30, sd=5. What is z score for the t=28.5 minutes? What is t if z=3?

Q4

- The monthly utility bills in a city are normally distributed with a mean value of 70 CAD, and variance of 64 CAD, what is the z score of 80 CAD utility bill?

$$Z = \frac{x - \mu}{\sigma}$$
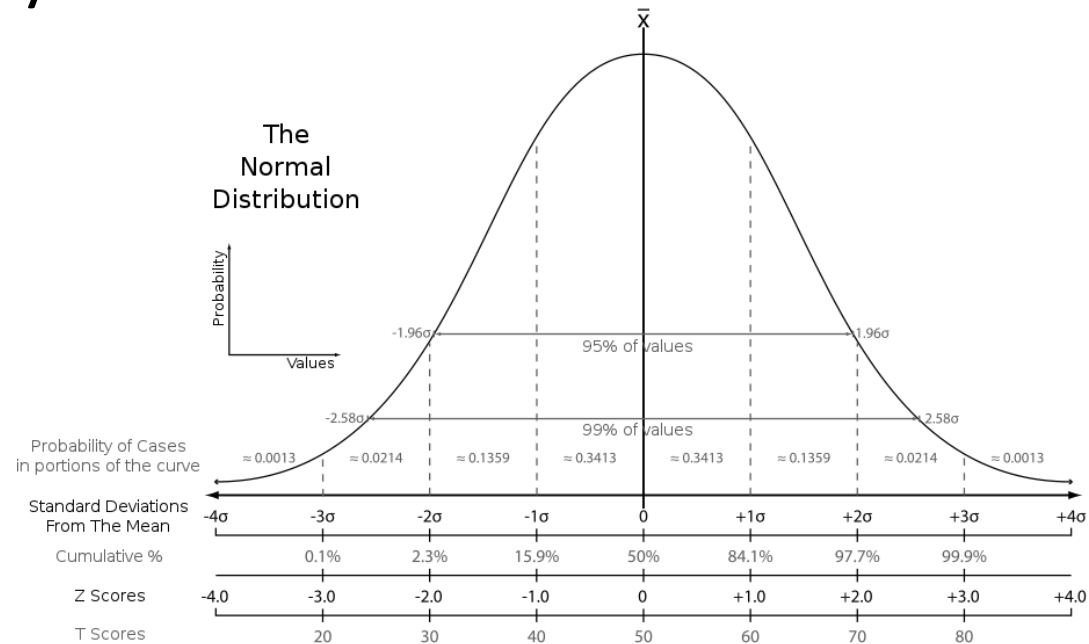
Q5

Suppose *IQ*'s are normally distributed with a mean of 100 and a standard deviation of 15.

What percentage of people have an *IQ* between 110 and 125?
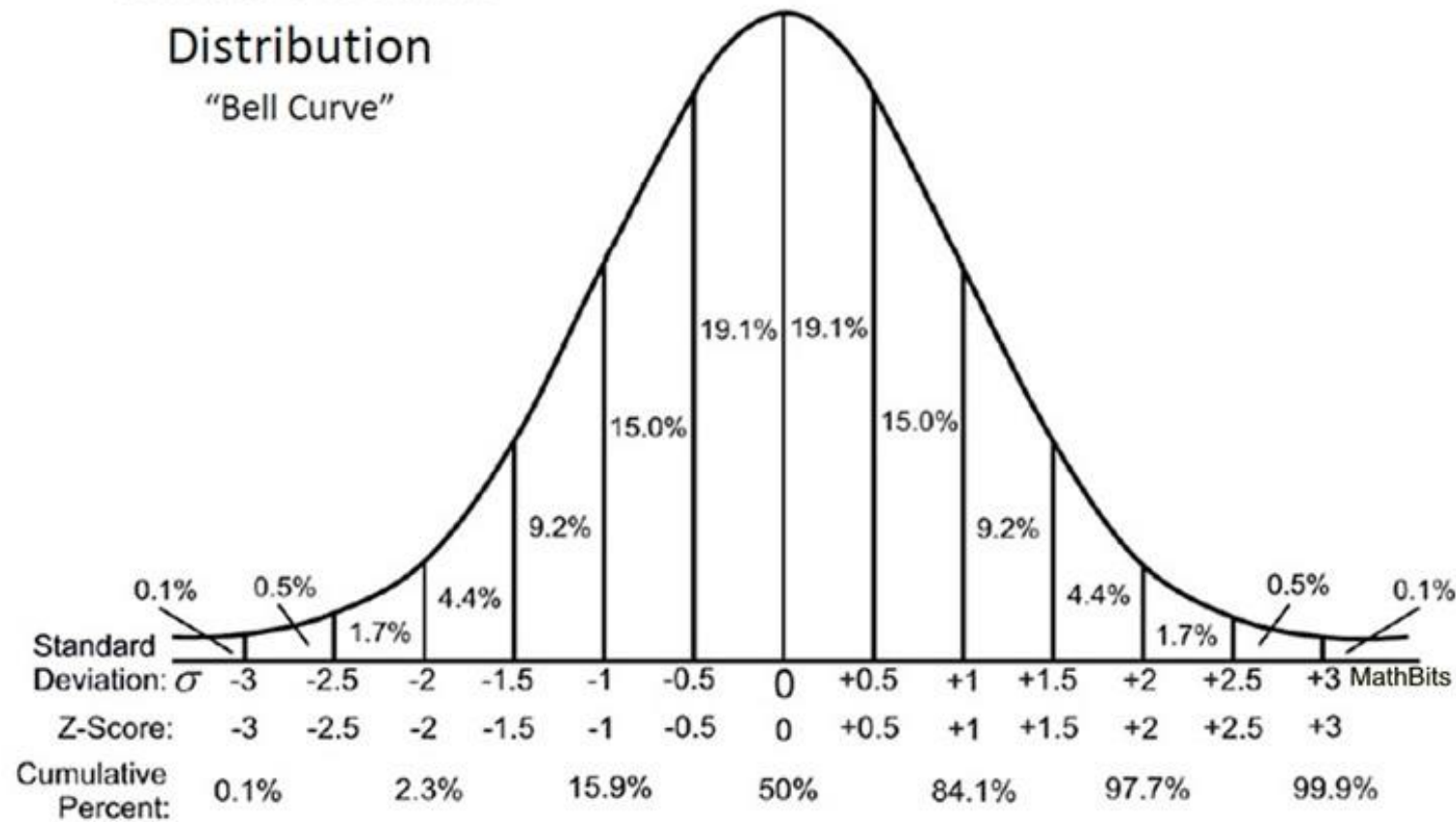
P(110<X<125)

Q6

- A sample of 10 scores are selected from a normally distributed population with mean 100 and standard deviation of 5.

- What is the probability that the sample mean is between 99 and 101?

Q7

- How do you distinguish binomial and poisson distribution?

Q8

Standard Normal Distribution "Bell Curve"

P(0<X<1.5)=?

What is the z score of 85%?

What are the z scores of the area that is covered 38%?

Q9

- The regression line between the math test (x <- independent variable) and calculus grade (y <- dependent) of the randomly selected students are as follows;

$$\hat{y}=40.78 + 0.76x$$

- What is residual value of a student who's math test score is 52 and calculus grade is 75?

Q10

- What are the corresponding relationship for following correlation values? (ex. Strong, weak, positive , negative)

- 1. r= 0.82
- 2. r= 0.1
- 3. r= -0.96
- 4. r= - 0.22

Q11 – Write the following equations from the regression outputs.

Simple Output

```
Call:
lm(formula = Sales ~ Spend, data = dataset)

Residuals:
   Min     1Q Median    3Q    Max
 -3385  -2097    258  1726   3034

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 1383.4714  1255.2404   1.102    0.296
Spend         10.6222     0.1625  65.378 1.71e-14 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 2313 on 10 degrees of freedom
Multiple R-squared:  0.9977, Adjusted R-squared:  0.9974
F-statistic:  4274 on 1 and 10 DF,  p-value: 1.707e-14
```

Multiple Regression Output

```
Call:
lm(formula = Sales ~ Spend + Month, data = dataset)

Residuals:
     Min       1Q   Median      3Q      Max
 -1793.73 -1558.33    -1.73 1374.19  1911.58

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -567.6098  1041.8836  -0.545  0.59913
Spend         10.3825     0.1328  78.159 4.65e-14 ***
Month        541.3736   158.1660   3.423  0.00759 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1607 on 9 degrees of freedom
Multiple R-squared:  0.999, Adjusted R-squared:  0.9988
F-statistic:  4433 on 2 and 9 DF,  p-value: 3.368e-14
```