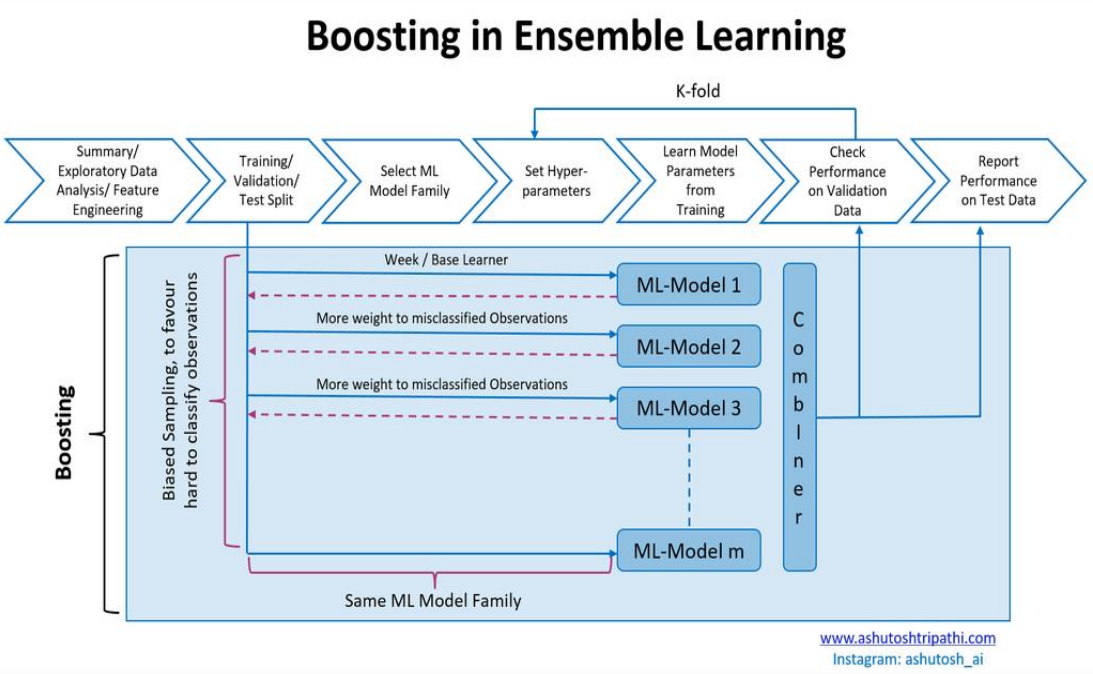
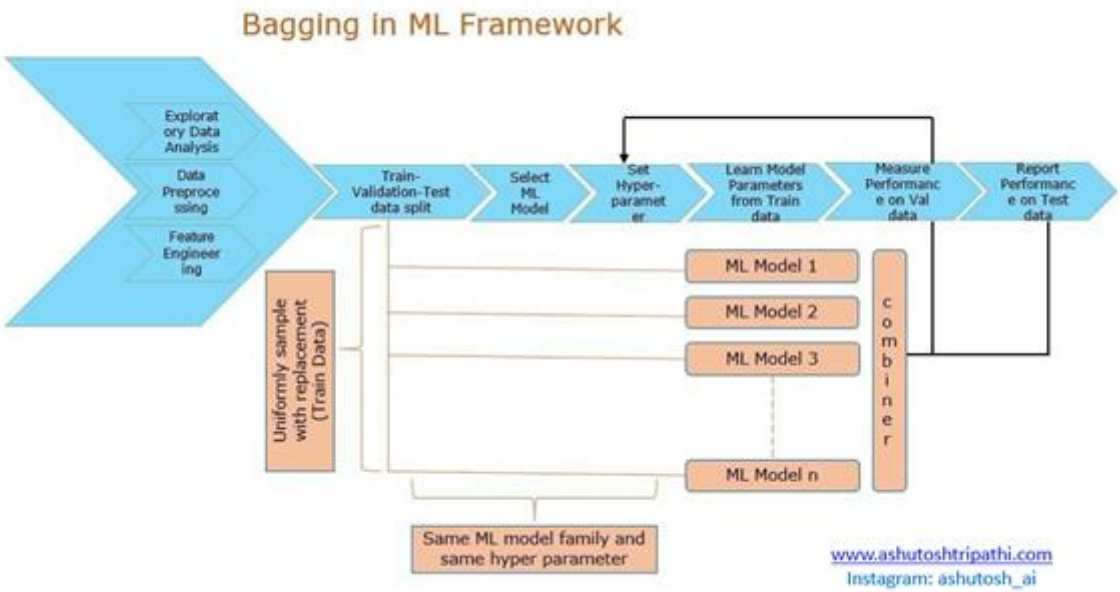
Data Science and Machine Learning | Yearly round-up 2019

Guys, I have consolidated all my ML and DS articles. In case you have missed it, here are the links in one place.

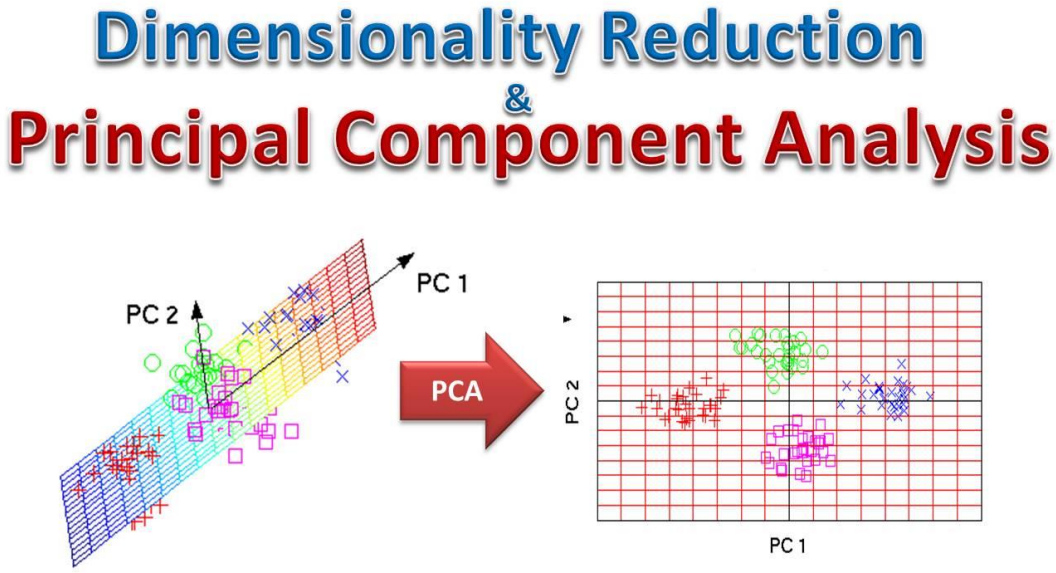
1. https://ashutoshtripathi.com/2019/12/16/what-is-boosting-in-ensemble-learning/



2. https://ashutoshtripathi.com/2019/12/09/what-is-bagging-in-ensemble-learning/

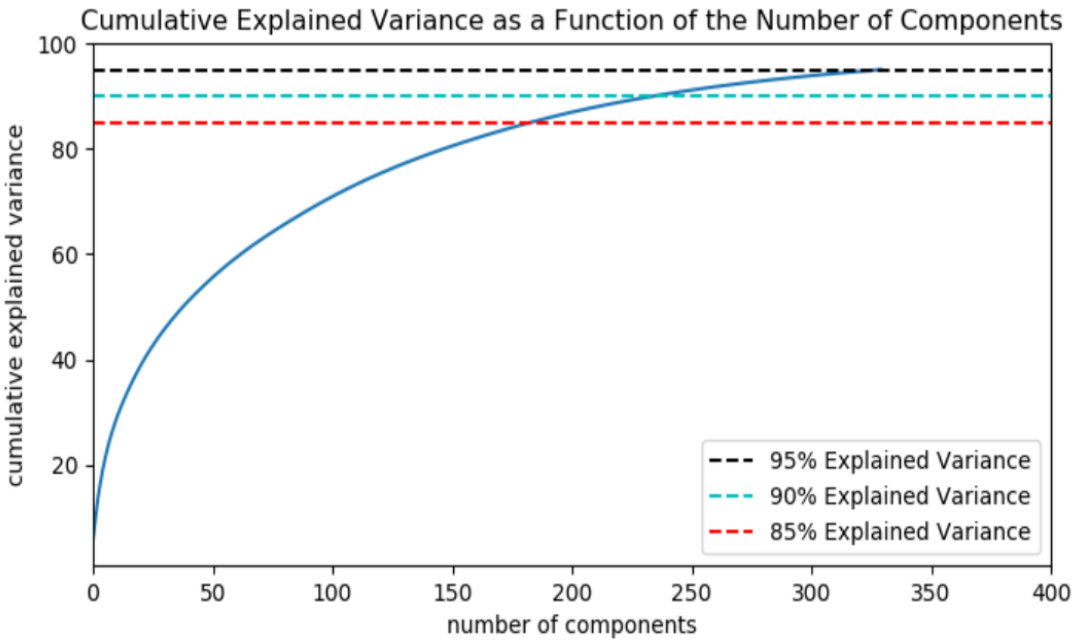


3. https://ashutoshtripathi.com/2019/07/11/a-complete-guide-to-principal-component-analysis-pca-in-machine-learning/



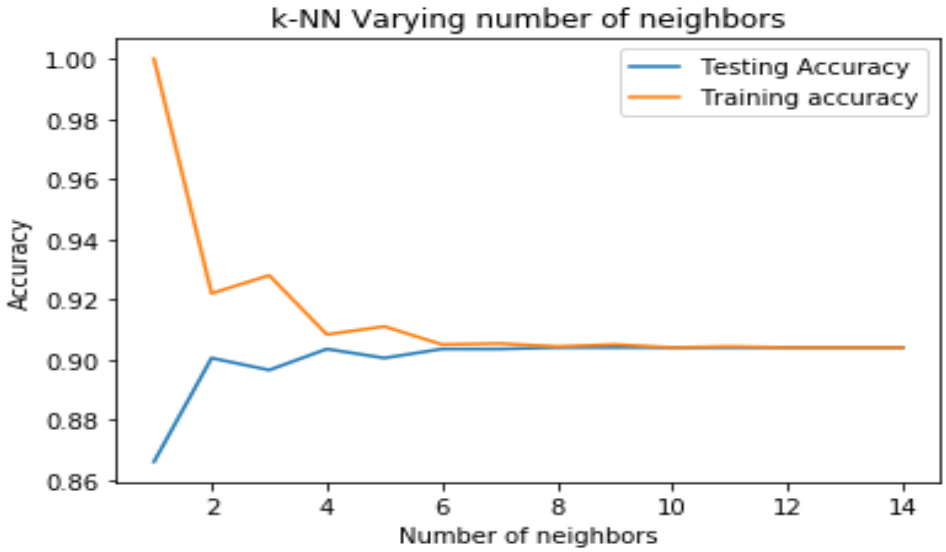
4. https://ashutoshtripathi.com/2019/07/15/step-by-step-approach-to-principal-component-analysis-using-python/

KNN in Machine Learning

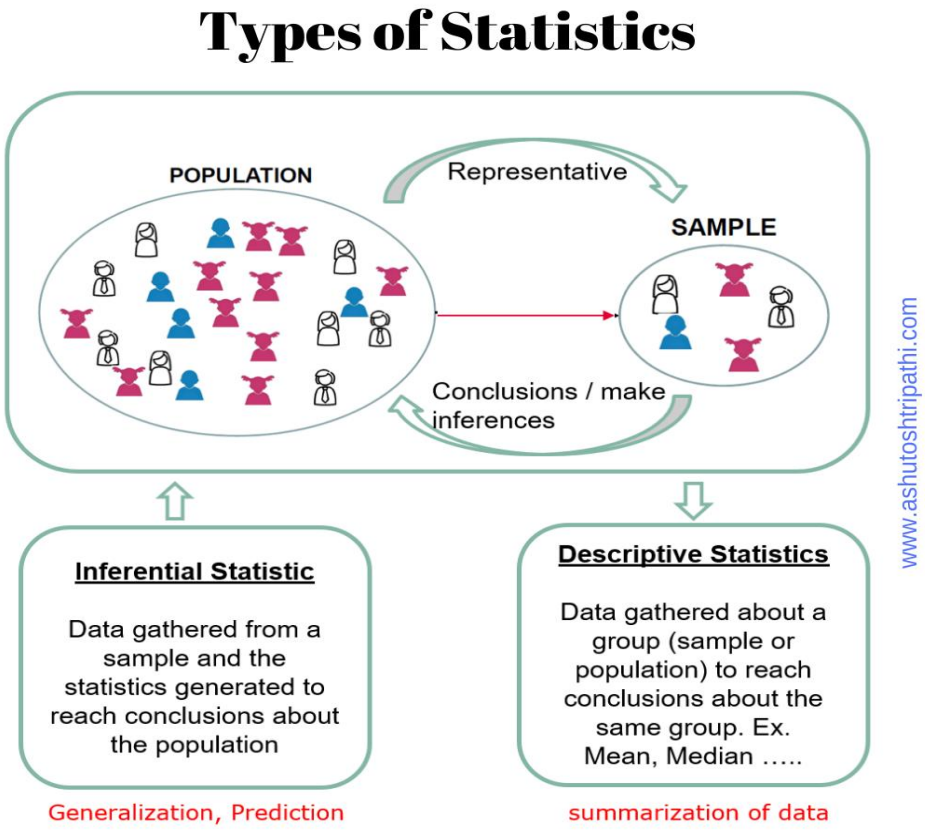


5. https://ashutoshtripathi.com/2019/08/05/a-complete-guide-to-k-nearest-neighbors-algorithm-knn-using-python/

KNN Implementation in Python



6. https://ashutoshtripathi.com/2019/04/18/basic-statistics-for-data-science-part-1/



7. https://ashutoshtripathi.com/2019/08/09/variance-standard-deviation-and-other-measures-of-variability-and-spread/

$$\textbf{Variance} = \sum_{i=1}^{n}(x_i - \mu)^2/n$$

Variance

$$\textbf{Standard Deviation} = \sqrt{\sum_{i=1}^{n}(x_i - \mu)^2/n} \ , \mu \ is \ mean$$

Standard Deviation

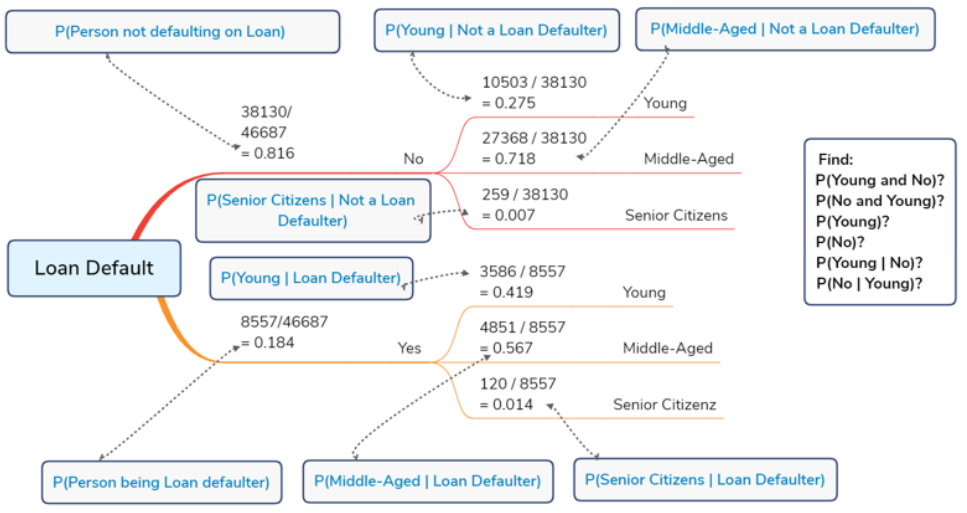
$$\textbf{Mean} = \sum_{i=1}^{n} x_i \ / \sum_{i=1}^{n} f_i$$ **(Sum of all scores / sum of frequencies)**

Mean

8. https://ashutoshtripathi.com/2019/08/15/conditional-probability-with-examples-for-data-science/

Conditional Probability Visualization using Probability Tree

		Age			
		Young	Middle-Aged	Senior Citizens	Total
Loan Default	No	10503	27368	259	38130
	Yes	3,586	4,851	120	8557
	Total	14089	32219	379	46687



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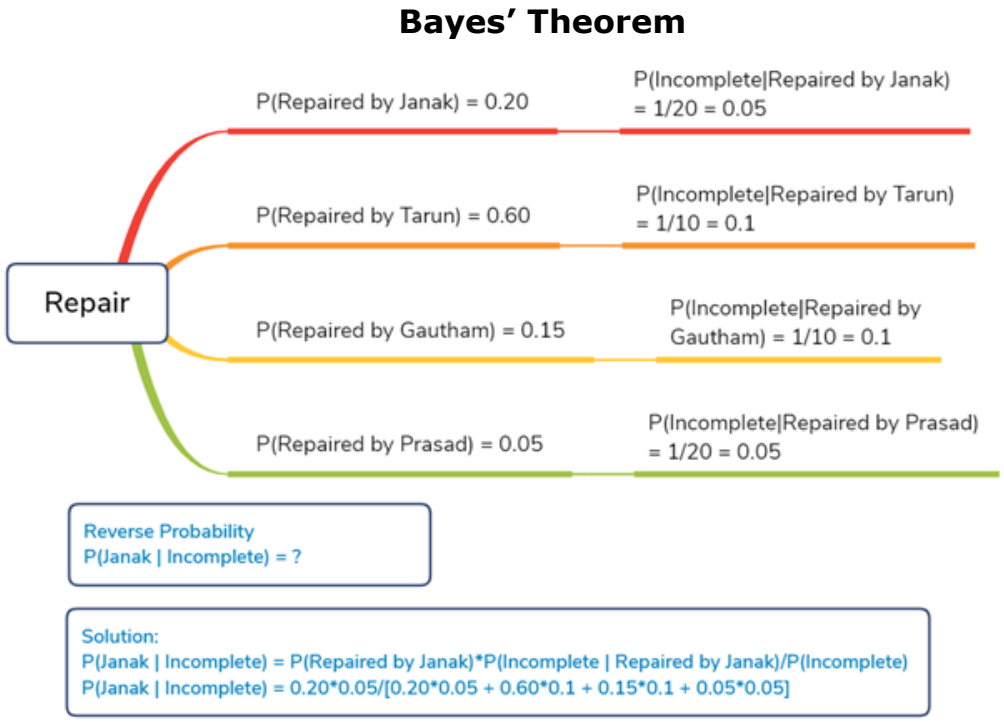
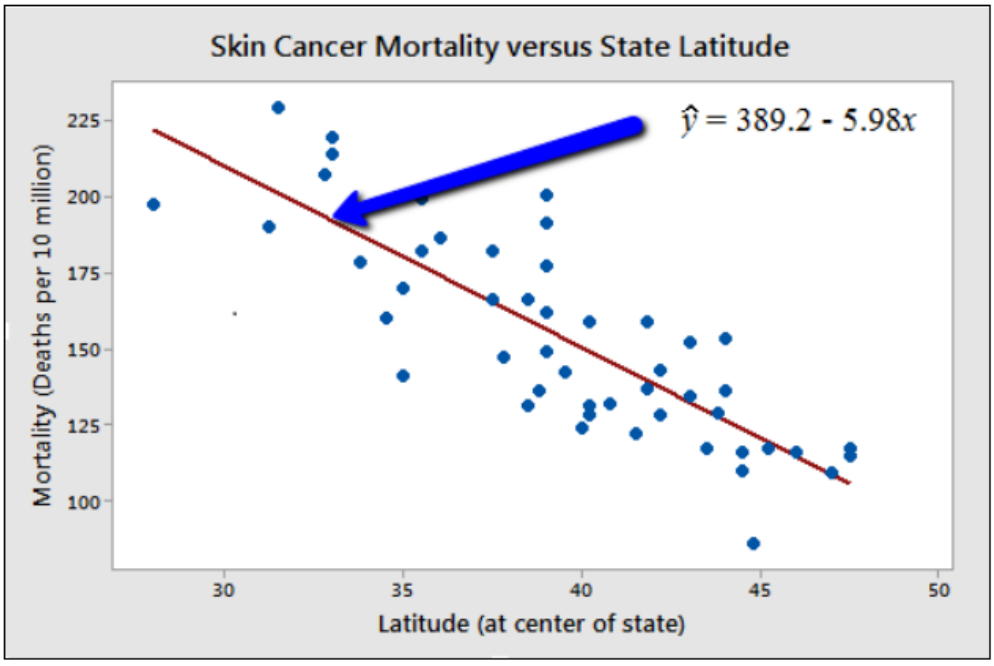
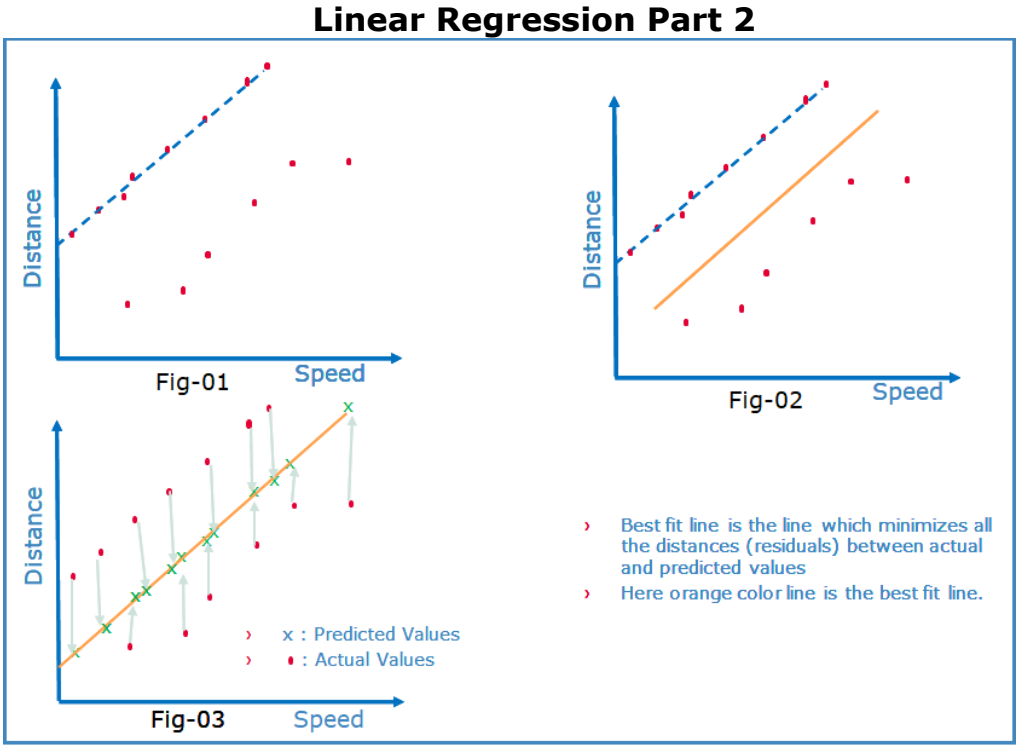
9. https://ashutoshtripathi.com/2019/08/20/bayes-theorem-with-example-for-data-science-professionals/



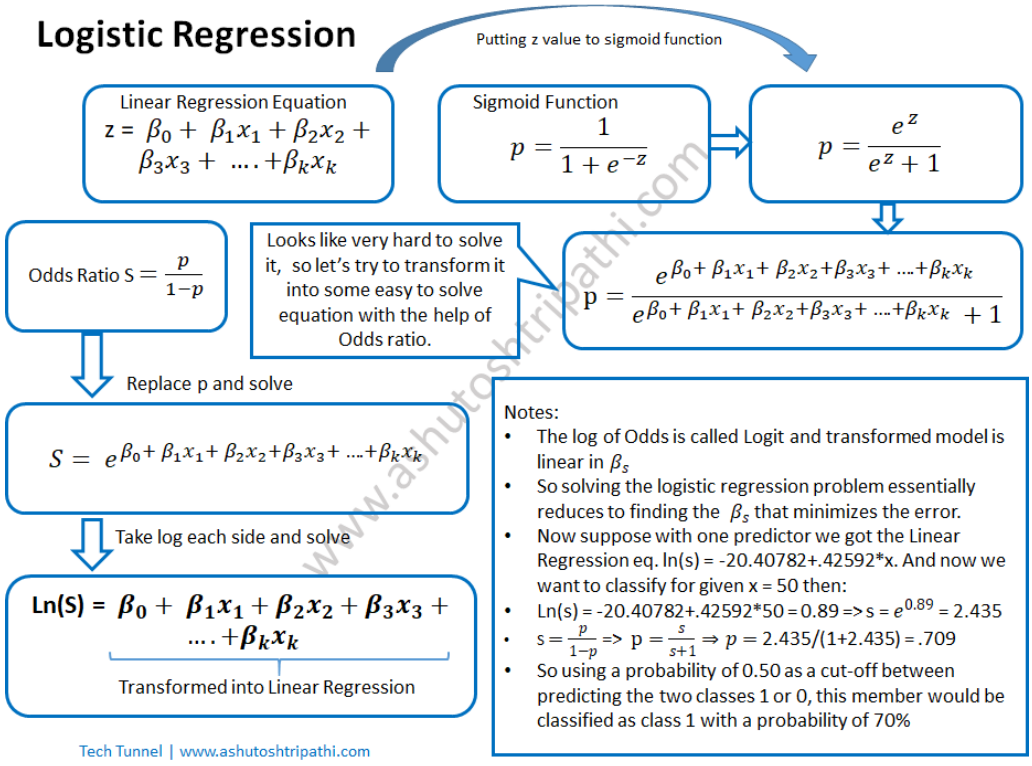
10. https://ashutoshtripathi.com/2019/01/16/what-is-linear-regression-part1/



11. https://ashutoshtripathi.com/2019/01/06/what-is-linear-regression-part2/



12. https://ashutoshtripathi.com/2019/06/17/logistic-regression-with-an-example-in-r/



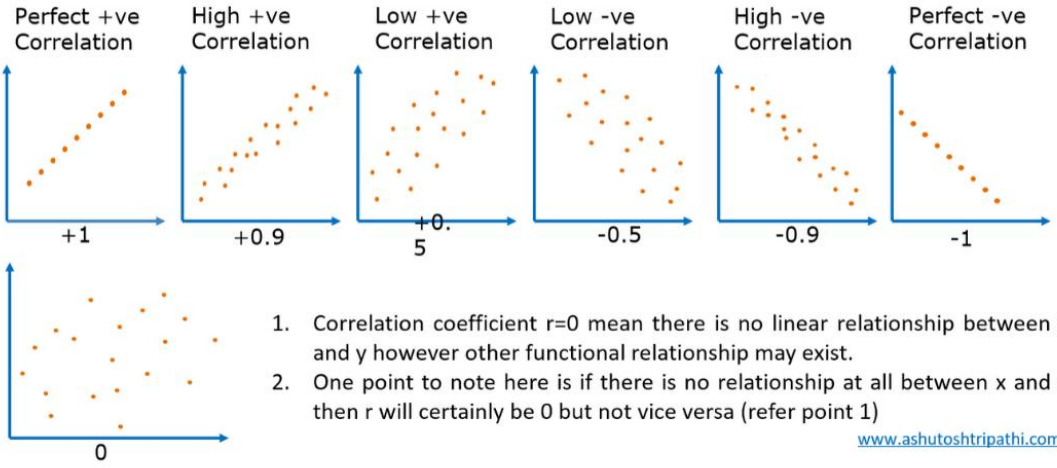
13. https://ashutoshtripathi.com/2019/01/15/covariance-and-correlation/

Correlation Coefficient

Correlation coefficient r is a number between -1 to +1 and tells us how well a regression line fits the data and defined by

$$r_{xy} = \frac{s_{xy}}{s_x s_y}$$ where,

- s_{xy} is the covariance between x and y
- s_x and s_y are the standard deviations of x and y respectively.



1. Correlation coefficient r=0 mean there is no linear relationship between x and y however other functional relationship may exist.
2. One point to note here is if there is no relationship at all between x and y then r will certainly be 0 but not vice versa (refer point 1)

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14. https://ashutoshtripathi.com/2019/01/22/what-is-the-coefficient-of-determination-r-square/

Coefficient of Determination (R Square)

$$R^2 = \frac{SSR}{SST}$$

$$SSR = \sum_i (\hat{y}_i - \bar{y})^2$$

$$SST = \sum_i (y_i - \bar{y})^2$$

Where,

- SSR is Sum of Squared Regression also known as variation explained by the model
- SST is Total variation in the data also known as sum of squared total
- y_i is the y value for observation i
- y_bar is the mean of y value
- y_bar_hat is predicted value of y for observation i

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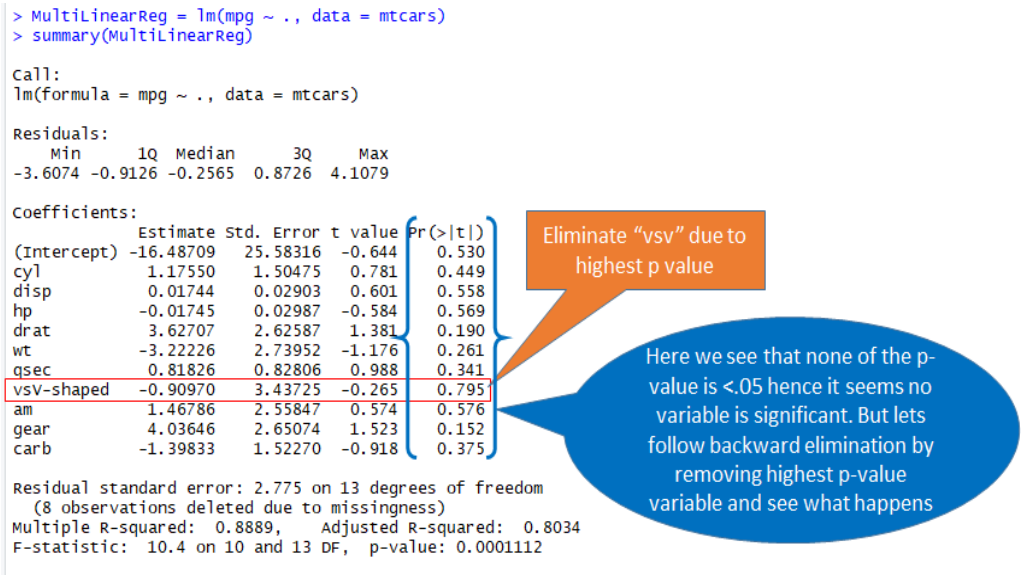
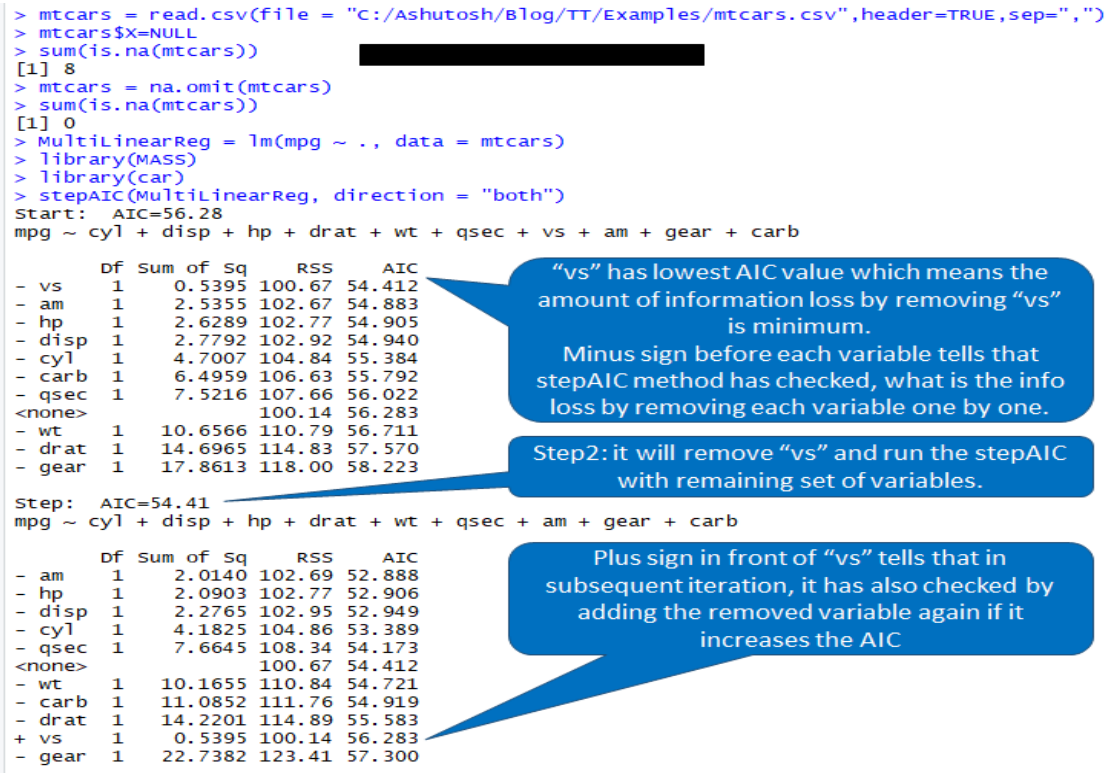
15. https://ashutoshtripathi.com/2019/06/07/feature-selection-techniques-in-regression-model/

Feature Selection Techniques



16. https://ashutoshtripathi.com/2019/06/10/what-is-stepaic-in-r/

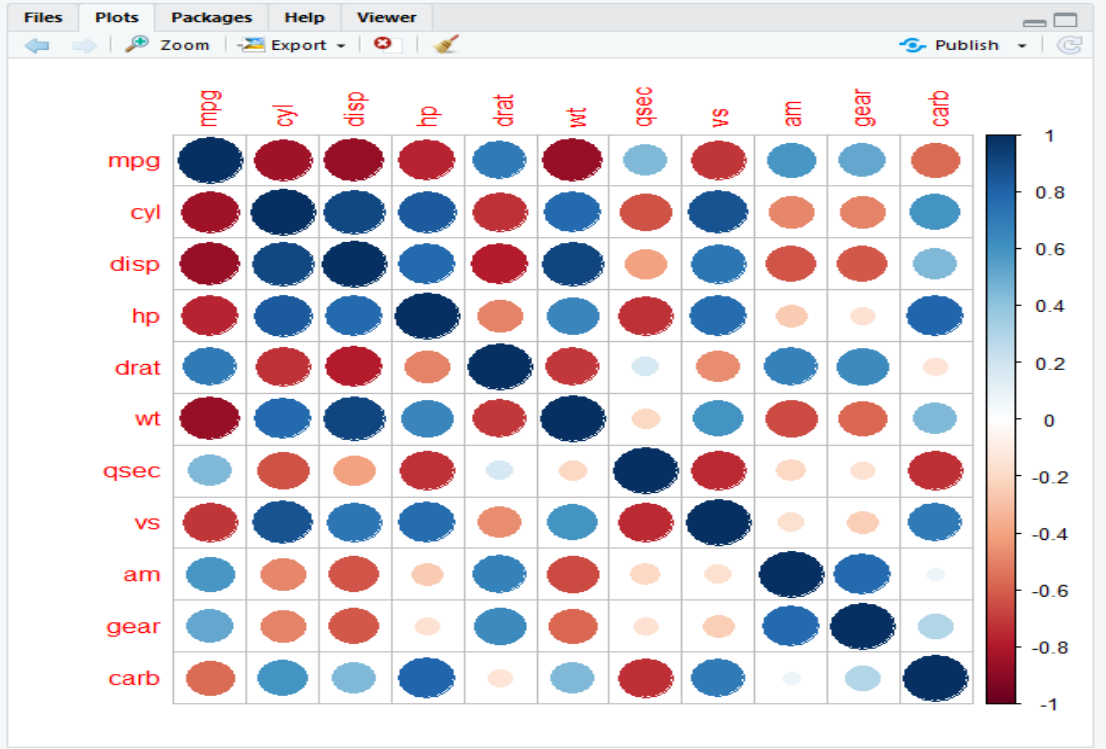
StepAIC in R



17.https://ashutoshtripathi.com/2019/06/13/what-is-multicollinearity/

Multicollinearity

```
> mtcars = read.csv(file = "[redacted]/mtcars.csv",header=
TRUE,sep=",")
> mtcars$X=NULL
> mtcars = na.omit(mtcars)
> mtcars$vs = as.numeric(mtcars$vs)
> install.packages("corrplot")
Error in install.packages : Updating loaded packages
> install.packages("corrplot")
Warning in install.packages :
  package 'corrplot' is in use and will not be installed
> library(corrplot)
> cor.mtcars = cor(mtcars)
> corrplot(cor.mtcars)
>
```



Thank You

Wish you all a Merry Christmas and a very Happy New Year

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