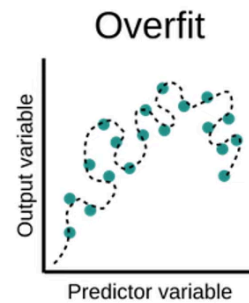
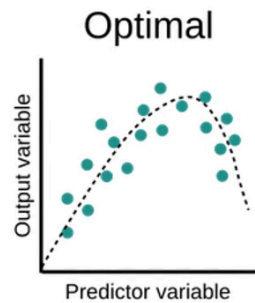


Overfitting and Underfitting

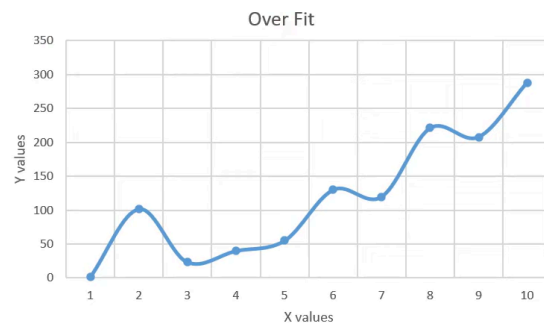
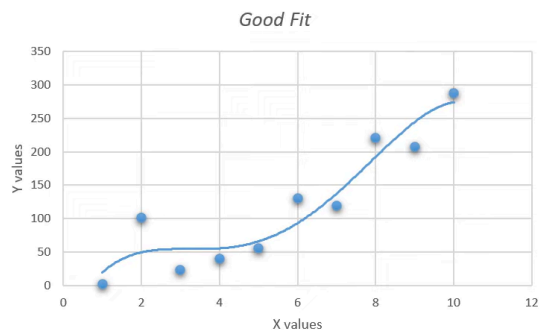
Overfitting

Overfitting refers to a model that models the training data too well. Overfitting happens when a model learns the detail and noise in the training dataset to the extent that it negatively impacts the performance of the model.



Sign that the model has Overfitted : High Training data Accuracy & very low Test data Accuracy


X	1	2	3	4	5	6	7	8	9	10
Y	1.38	101.41	23.34	39.89	55.23	129.91	119.33	221.09	207.43	287.80



Causes for Overfitting:

1. Less Data
2. Increased Complexity of the model
3. More number of layers in Neural Network

Preventing Overfitting by:

1. Using more data
2. Reduce the number of layers in the Neural network
3. Early Stopping 
4. Bias – Variance Tradeoff
5. Use Dropouts

Dropouts are used in DL where some neurons are dropped randomly.

UNDERFITTING

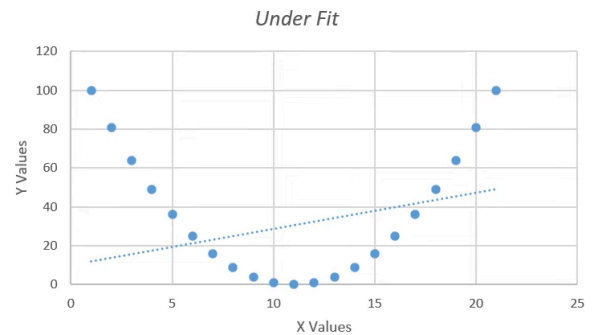
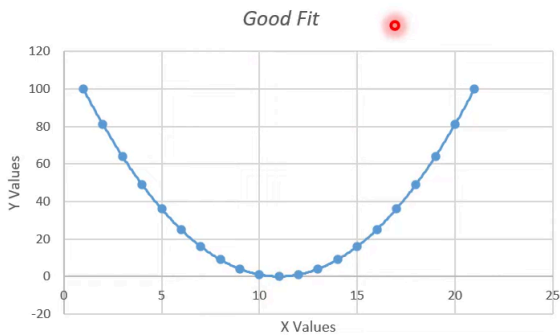
Underfitting

Underfitting happens when the model **does not learn enough** from the data. Underfitting occurs when a machine learning model cannot capture the underlying trend of the data



Sign that the model has Underfitted : Very Low Training data Accuracy

X	-10	-9	-8	-7	.....	0	.....	7	8	9	10
Y	100	81	64	49	.....	0	.....	49	64	81	100



Causes for Underfitting:

1. Choosing a wrong model
2. Less complexity of the model
3. Less variance but high bias

Prevent Underfitting by:

1. Choosing the correct model appropriate for the problem
2. Increasing the complexity of the model
3. More number of parameters to the model
4. Bias – Variance Tradeoff