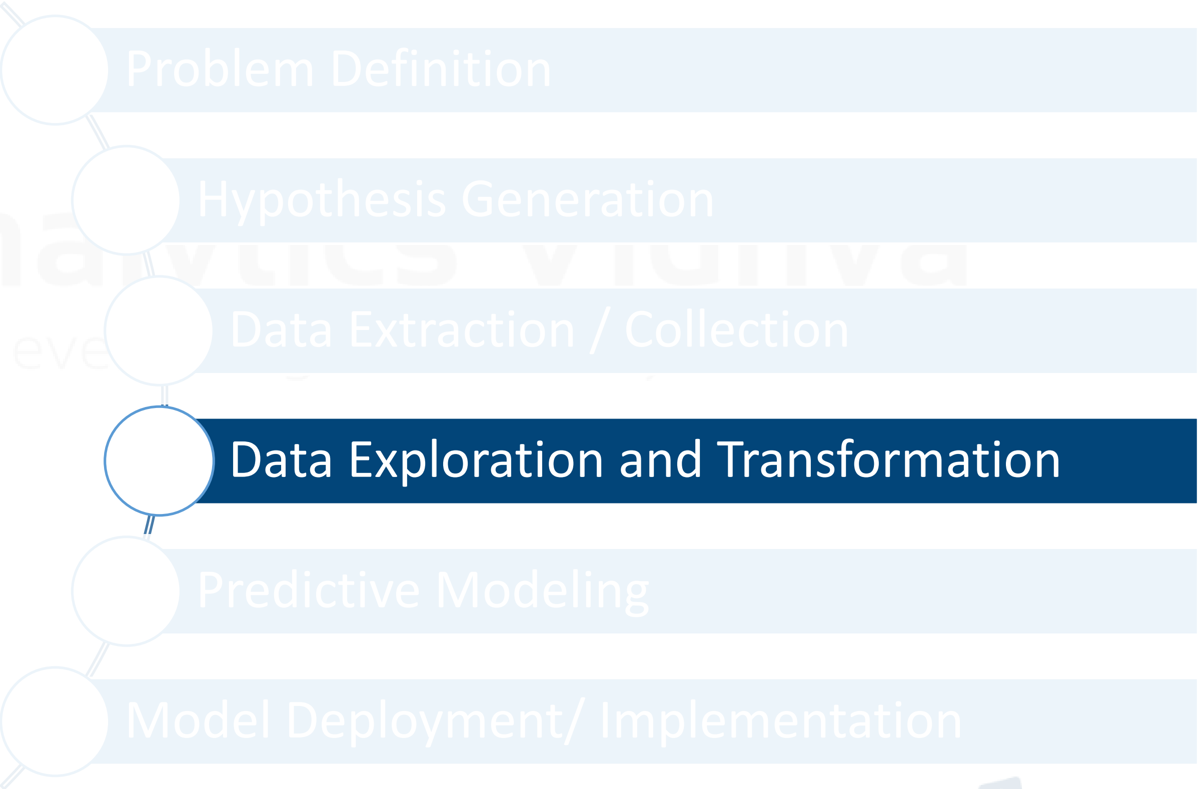
Predictive Modeling

Stages of Predictive Modeling

We can broadly divide the model building life cycle in six stages:



Problem Definition

Hypothesis Generation

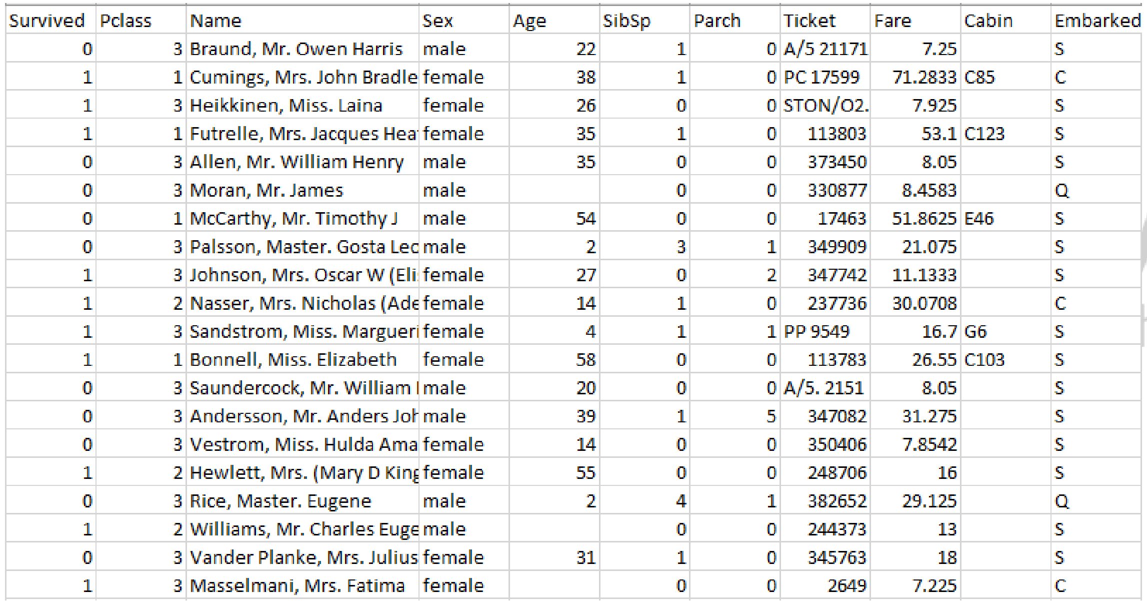
Data Extraction / Collection

Data Exploration and Transformation

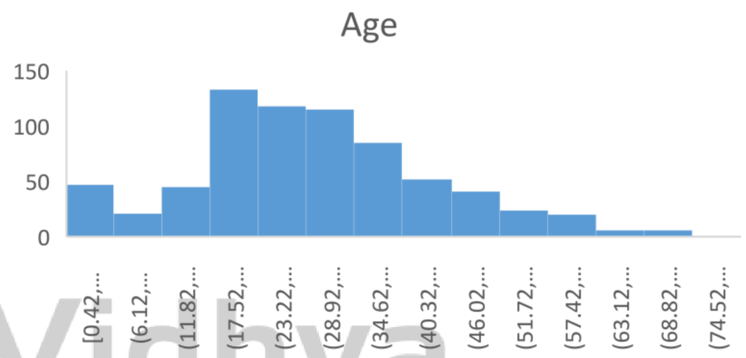
Predictive Modeling

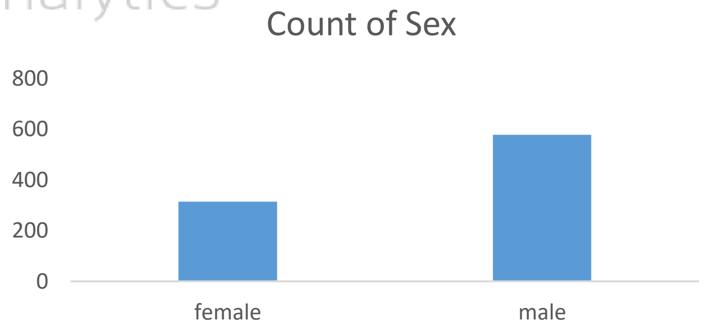
Model Deployment/ Implementation

Data Exploration



Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	3	Braund, Mr. Owen Harris	male	22	1	0	A/5 21171	7.25		S
1	1	Cumings, Mrs. John Bradle	female	38	1	0	PC 17599	71.2833	C85	C
1	3	Heikkinen, Miss. Laina	female	26	0	0	STON/O2.	7.925		S
1	1	Futrelle, Mrs. Jacques Hea	female	35	1	0	113803	53.1	C123	S
0	3	Allen, Mr. William Henry	male	35	0	0	373450	8.05		S
0	3	Moran, Mr. James	male		0	0	330877	8.4583		Q
0	1	McCarthy, Mr. Timothy J	male	54	0	0	17463	51.8625	E46	S
0	3	Palsson, Master. Gosta Lec	male	2	3	1	349909	21.075		S
1	3	Johnson, Mrs. Oscar W (Eli	female	27	0	2	347742	11.1333		S
1	2	Nasser, Mrs. Nicholas (Ade	female	14	1	0	237736	30.0708		C
1	3	Sandstrom, Miss. Margueri	female	4	1	1	PP 9549	16.7	G6	S
1	1	Bonnell, Miss. Elizabeth	female	58	0	0	113783	26.55	C103	S
0	3	Saundercock, Mr. William I	male	20	0	0	A/5. 2151	8.05		S
0	3	Andersson, Mr. Anders Joh	male	39	1	5	347082	31.275		S
0	3	Vestrom, Miss. Hulda Ama	female	14	0	0	350406	7.8542		S
1	2	Hewlett, Mrs. (Mary D King	female	55	0	0	248706	16		S
0	3	Rice, Master. Eugene	male	2	4	1	382652	29.125		Q
1	2	Williams, Mr. Charles Euge	male		0	0	244373	13		S
0	3	Vander Planke, Mrs. Julius	female	31	1	0	345763	18		S
1	3	Masselmani, Mrs. Fatima	female		0	0	2649	7.225		C





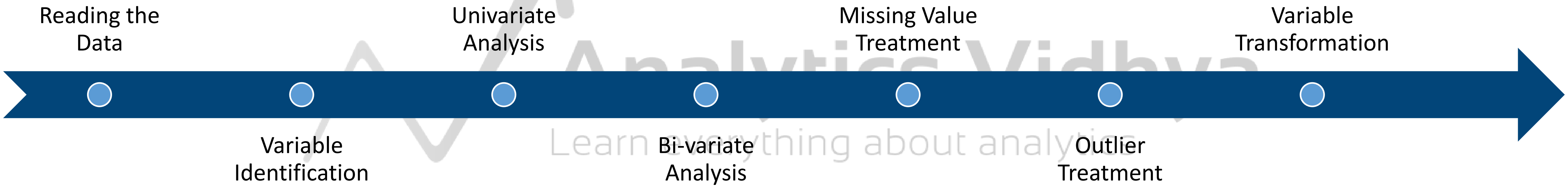
Data Exploration

Good Analyst vs Bad Analyst :

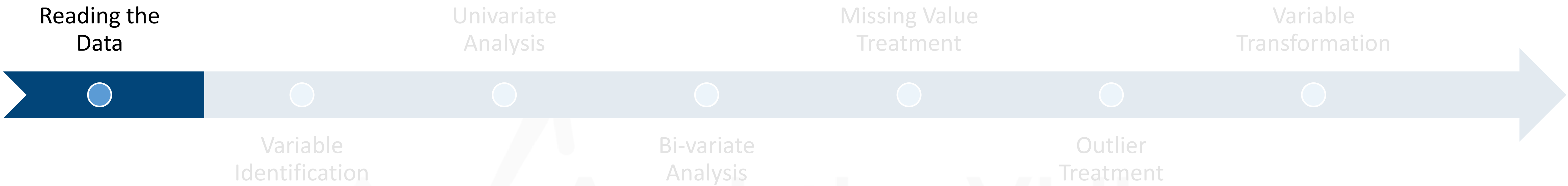
Good Analyst – Knows his/her data well.

Bad Analyst – Relies on tools and libraries

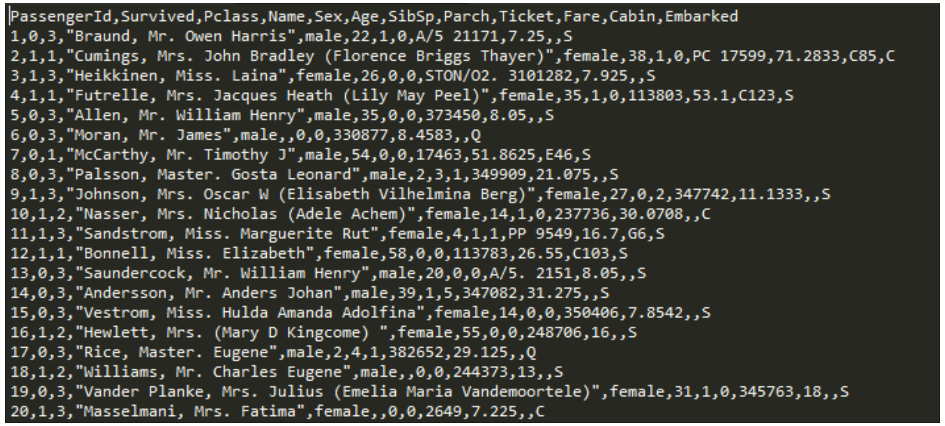
Data Exploration/ Transformation



Steps for Data Exploration

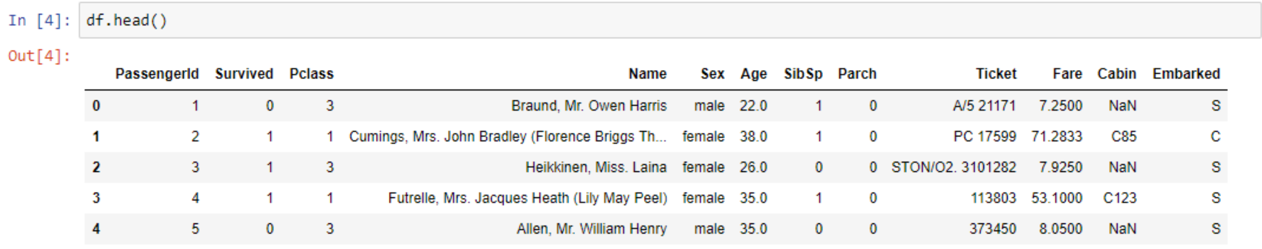


Raw csv



```
PassengerId,Survived,Pclass,Name,Sex,Age,SibSp,Parch,Ticket,Fare,Cabin,Embarked
1,0,3,"Braund, Mr. Owen Harris",male,22,1,0,A/5 21171,7.25,,S
2,1,1,"Cumings, Mrs. John Bradley (Florence Briggs Thayer)",female,38,1,0,PC 17599,71.2833,C85,C
3,1,3,"Heikkinen, Miss. Laina",female,26,0,0,STON/O2. 3101282,7.925,,S
4,1,1,"Futrelle, Mrs. Jacques Heath (Lily May Peel)",female,35,1,0,113803,53.1,C123,S
5,0,3,"Allen, Mr. William Henry",male,35,0,0,373450,8.05,,S
6,0,3,"Moran, Mr. James",male,,0,0,330877,8.4583,,Q
7,0,1,"McCarthy, Mr. Timothy J",male,54,0,0,17463,51.8625,E46,S
8,0,3,"Palsson, Master. Gosta Leonard",male,2,3,1,349909,21.075,,S
9,1,3,"Johnson, Mrs. Oscar W (Elisabeth Vilhelmina Berg)",female,27,0,2,347742,11.1333,,S
10,1,2,"Nasser, Mrs. Nicholas (Adele Achem)",female,14,1,0,237736,30.0708,,C
11,1,3,"Sandstrom, Miss. Marguerite Rut",female,4,1,1,PP 9549,16.7,G6,S
12,1,1,"Bonnell, Miss. Elizabeth",female,58,0,0,113783,26.55,C103,S
13,0,3,"Saundercock, Mr. William Henry",male,20,0,0,A/5. 2151,8.05,,S
14,0,3,"Andersson, Mr. Anders Johan",male,39,1,5,347082,31.275,,S
15,0,3,"Vestrom, Miss. Hulda Amanda Adolfina",female,14,0,0,350406,7.8542,,S
16,1,2,"Hewlett, Mrs. (Mary D Kingcome) ",female,55,0,0,248706,16,,S
17,0,3,"Rice, Master. Eugene",male,2,4,1,382652,29.125,,Q
18,1,2,"Williams, Mr. Charles Eugene",male,,0,0,244373,13,,S
19,0,3,"Vander Planke, Mrs. Julius (Emelia Maria Vandemoortele)",female,31,1,0,345763,18,,S
20,1,3,"Masselmani, Mrs. Fatima",female,,0,0,2649,7.225,,C
```

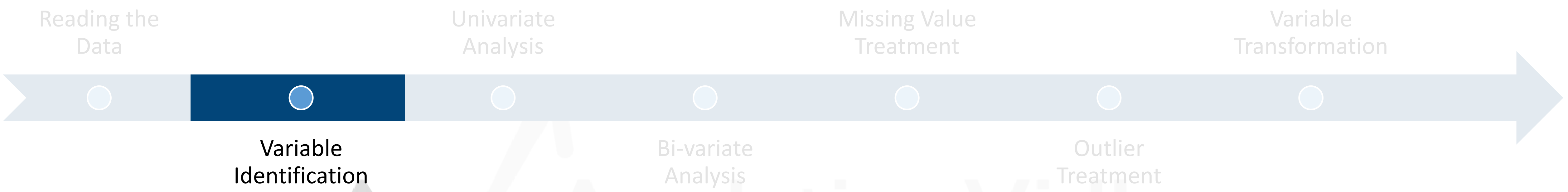
Pandas Dataframe- Python



```
In [4]: df.head()
Out[4]:
```

	PassengerId	Survived	Pclass	Name	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked
0	1	0	3	Braund, Mr. Owen Harris	male	22.0	1	0	A/5 21171	7.2500	NaN	S
1	2	1	1	Cumings, Mrs. John Bradley (Florence Briggs Th...	female	38.0	1	0	PC 17599	71.2833	C85	C
2	3	1	3	Heikkinen, Miss. Laina	female	26.0	0	0	STON/O2. 3101282	7.9250	NaN	S
3	4	1	1	Futrelle, Mrs. Jacques Heath (Lily May Peel)	female	35.0	1	0	113803	53.1000	C123	S
4	5	0	3	Allen, Mr. William Henry	male	35.0	0	0	373450	8.0500	NaN	S

Steps for Data Exploration



Reading the Data

Variable Identification

Univariate Analysis

Bi-variate Analysis

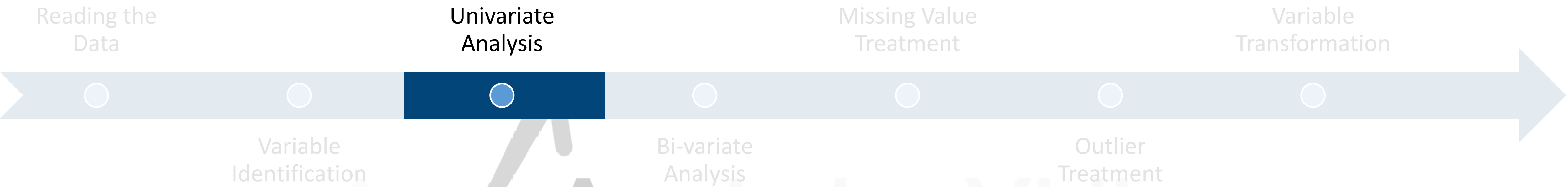
Missing Value Treatment

Outlier Treatment

Variable Transformation

Type of Variable	Data Type	Variable Category
Predictor -Pclass -Sex -Age Target - Survived	Character -Name -Ticket -Sex Numeric -Age -Pclass	Categorical -Sex -Cabin -Embarked Continuous -SibSp -Parch

Steps for Data Exploration



Reading the Data

Variable Identification

Univariate Analysis

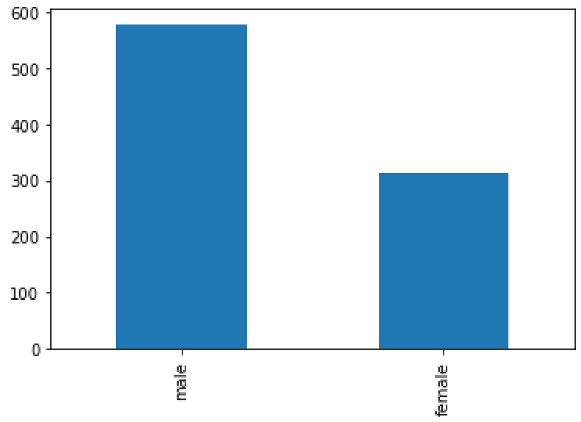
Bi-variate Analysis

Missing Value Treatment

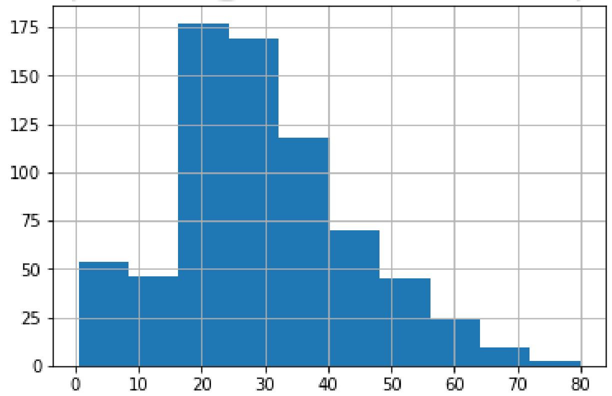
Outlier Treatment

Variable Transformation

We analyze variables one by one

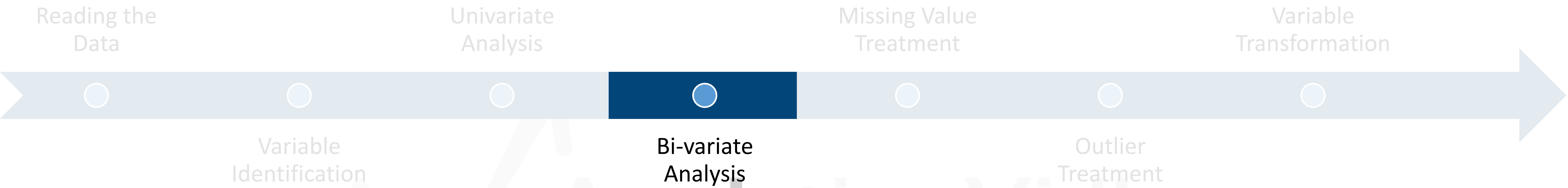


Bar plot of count of gender



Histogram of age

Steps for Data Exploration



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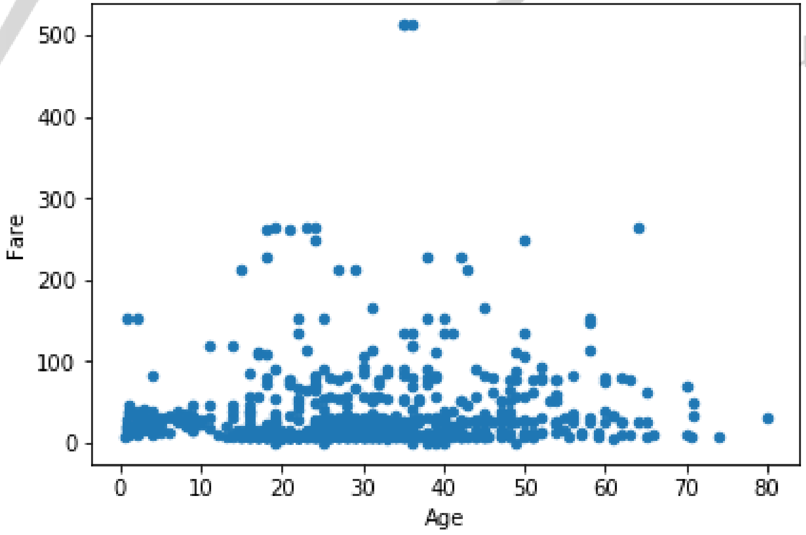
Variable Transformation



Analytics Vidhya
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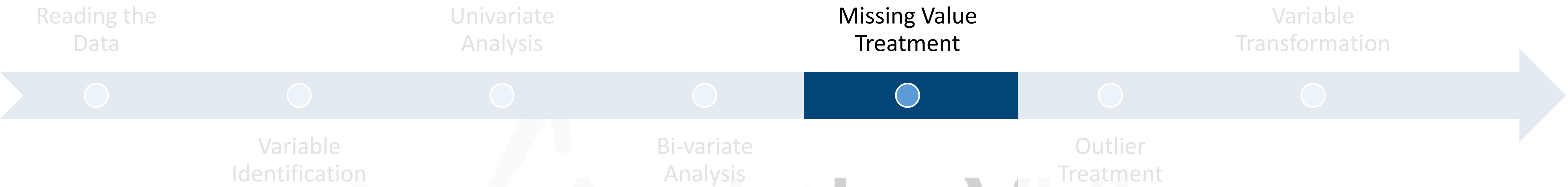
Steps for Data Exploration



Reading the Data

Variable Identification

Univariate Analysis

Bi-variate Analysis

Missing Value Treatment

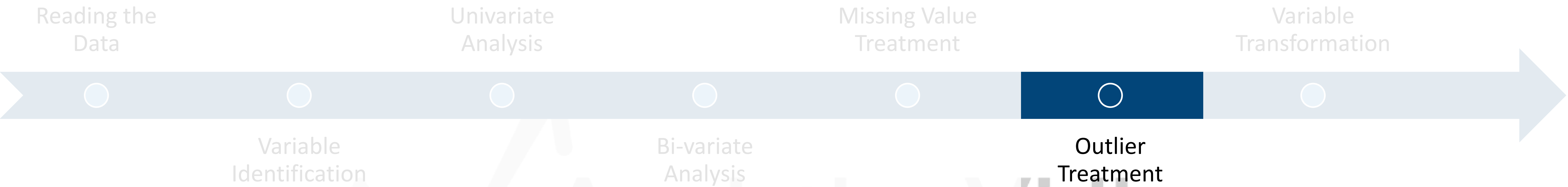
Outlier Treatment

Variable Transformation

Find out and treat missing values in the dataset using -

1. Mean
2. Mode
3. Median

Steps for Data Exploration



Reading the Data

Variable Identification

Univariate Analysis

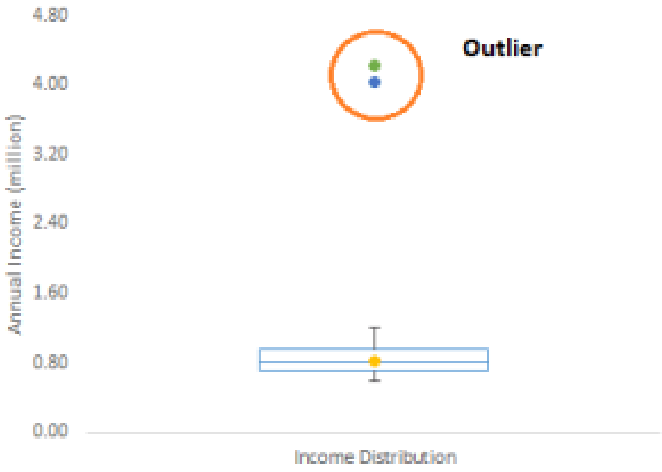
Bi-variate Analysis

Missing Value Treatment

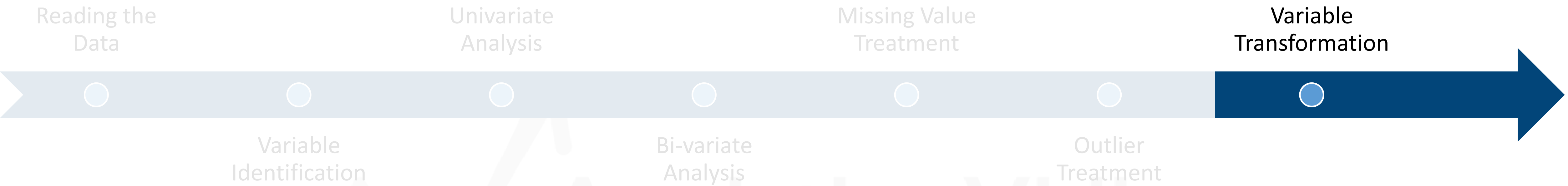
Outlier Treatment

Variable Transformation

Outlier is an observation that appears far away and diverges from an overall pattern in a sample.



Steps for Data Exploration



Reading the Data

Variable Identification

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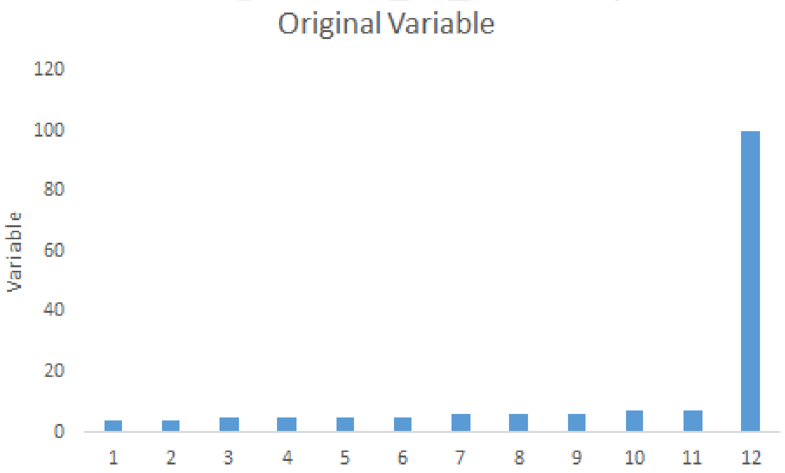

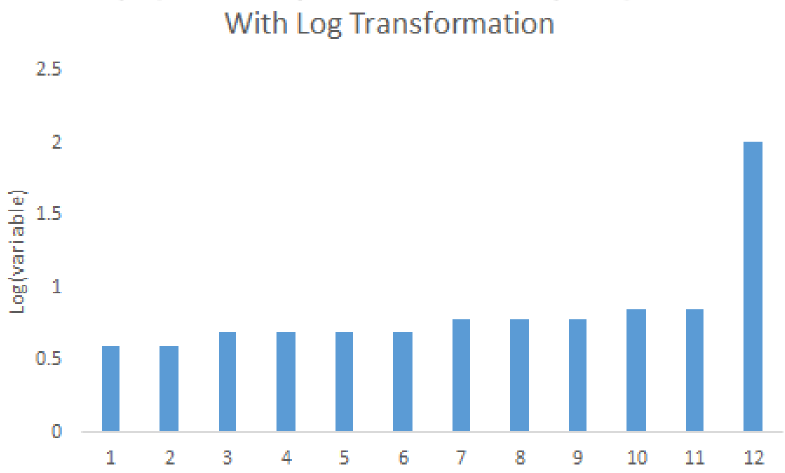

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Thank You