

# Predictive Analytics

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# Outline



Diagnostic Analytics



Why / When?



Techniques and Tools



Case Study

# 4 Types of Data Analytics



DESCRIPTIVE  
ANALYTICS



DIAGNOSTIC  
ANALYTICS



PREDICTIVE  
ANALYTICS



PRESCRIPTIVE  
ANALYTICS

# 4 Types of Data Analytics

## DESCRIPTIVE

CLEAN  
SUMMARIZE  
REPORT  
VISUALIZE

## DIAGNOSTIC

DATA DISCOVERY  
HYPOTHESIS TESTING  
DRILL DOWN  
DATA MINING  
CORRELATION

## PREDICTIVE

REGRESSION  
CLASSIFICATION  
CLUSTERING  
TIME-SERIES  
NEURAL NETWORKS  
DEEP LEARNING

## PRESCRIPTIVE

# Research Questions

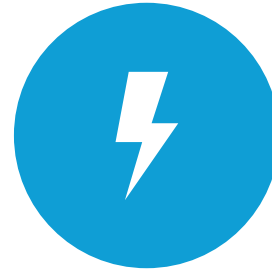
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WHAT  
HAPPENED?



WHY DID IT  
HAPPEN?



WHAT WILL  
HAPPEN?



WHAT IS A  
DECISION?

# Why Diagnostic Analytics?



Vital Tool In Todays Data Driven Landscape

Anticipating Future Outcomes

Strategic Decision Making

Customer Understanding And Personalization





# When Diagnostic Analytics?



Financial Analysis



Sales and Marketing  
Analytics



Manufacturing and  
Supply Chain  
Management



Healthcare  
Analytics

# When Diagnostic Analytics?

Improve Profit  
Margin

Optimize  
Marketing  
Campaigns

Reduce Risk

Create pricing  
strategies,  
Configure store  
layouts

Increase cross-selling  
by personalized  
recommendations,  
Predict customer  
buying patterns

Detect Fraudulent  
Transactions,  
Accurate  
Customer Credit  
Scoring



# What is Diagnostic Analytics?

- What is going to happen
- It is mainly used to predict future events or outcomes.



# What is Diagnostic Analytics?



# How does Diagnostic Analytics work?



Clearly Defining The Problem At Hand to Help determine the appropriate predictive analytics approach



# How does Diagnostic Analytics work?



Data Is The Lifeblood Of Predictive Analytics.



# How does Diagnostic Analytics work?



Pre-processing ensures the data is of high quality and ready for model development.



# How does Diagnostic Analytics work?



Models Are Trained On The Prepared Data To Identify Correlations And Patterns That Can Be Used For Making Predictions.





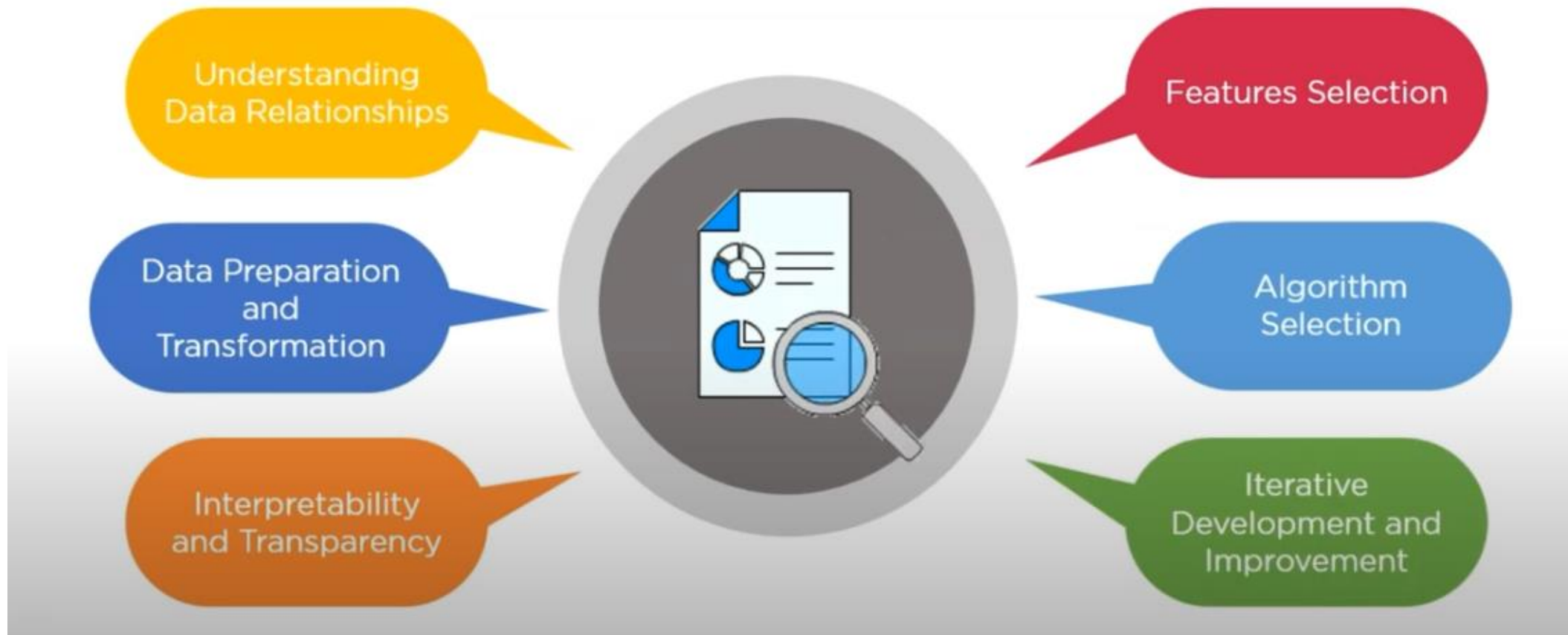
# How does Diagnostic Analytics work?



Rigorously Evaluate The Model's Performance Against Known Outcomes Or Test Datasets.



# Using Data Models for Diagnostic Analytics



# When Diagnostic is Analytics recommended?

## Predictive Analytics: Advantages & Disadvantages

### ADVANTAGES

- Gives you an advantage in the market by revealing future insights.
- Saves time, money, energy and other resources.
- Enables better business decision-making and growth.

### DISADVANTAGES

- Setting up entire projects requires extensive planning.
- Getting the correct team onboarded might pose a problem.
- You need to spend time to let machine learning learn the business.

# Techniques



# Techniques



# Techniques





# Techniques in Diagnostic Analytics

**01** Classification Model

**02** Regression Model

**03** Clustering Model

**04** Time Series Model

**05** Neural Network Model



# Case 1

How to forecast using Excel in 2020 ( All Excel Versions) - Excel

File Home Insert Page Layout Formulas Data Review View Add-ins Help Search

Clipboard Font Alignment Number Styles Cells Editing

J6 =FORECAST.ETS.CONFINT(D6,\$B\$6:\$B\$17,\$A\$6:\$A\$17)

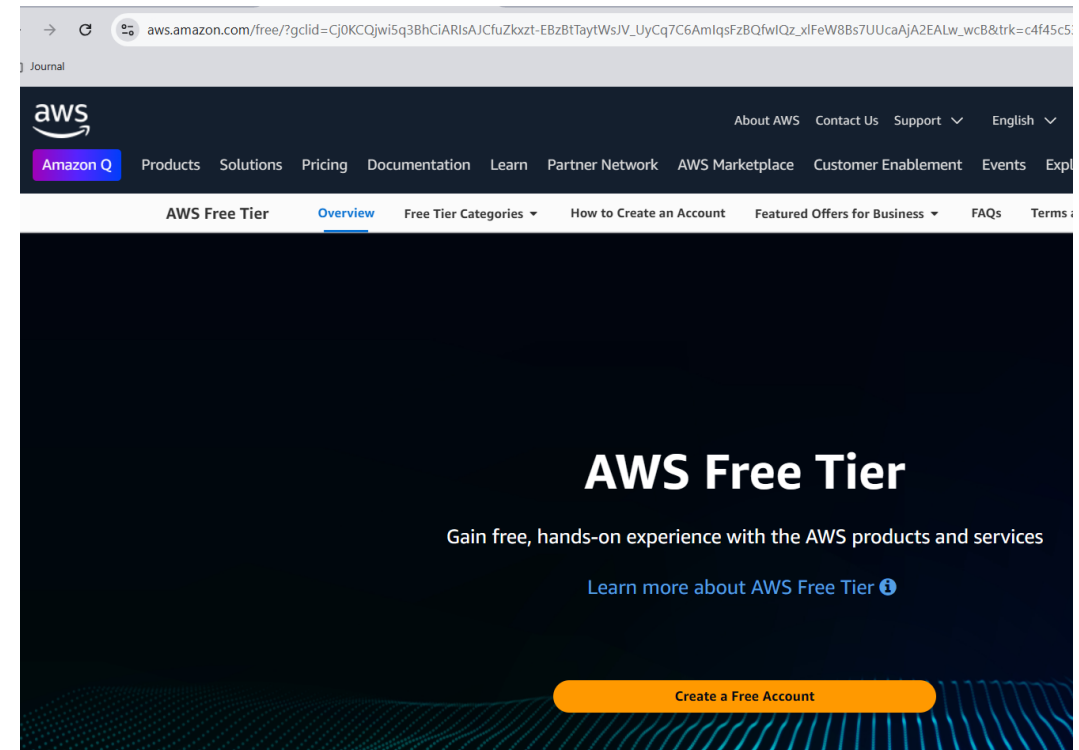
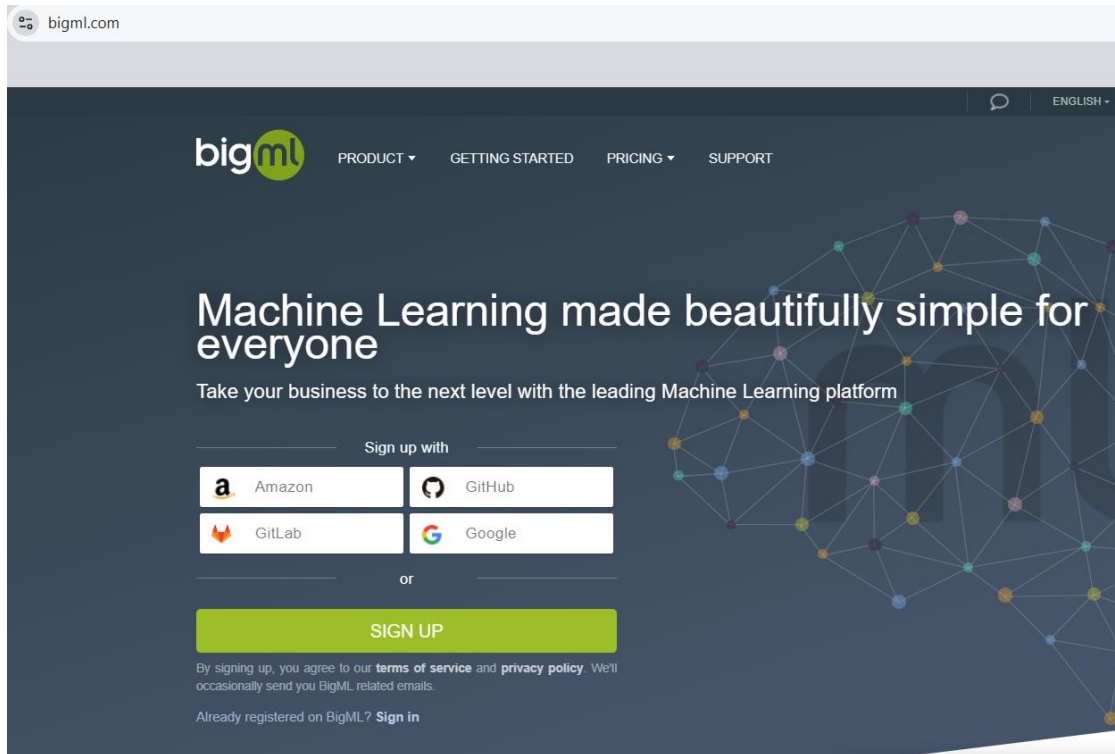
	A	B	C	D	E	F	G	H	I	J
1	Original data		Forecasted Revenue							
2										
3				FORECAST	F. LINEAR	F.ETS	F. ETS.SEASONALITY	F.ETS & SEASONALITY	F. CONFINT	
4										
5	Date	Revenue	Date	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue	Revenue
6	31/01/2019	\$20,000,000	31/01/2020	\$20,215,894.09	\$20,215,894.09	\$21,924,229	2	\$21,924,229	\$2,307,520.39	
7	28/02/2019	\$17,000,000	29/02/2020	\$20,295,898.76	\$20,295,898.76	\$19,485,232	2	\$19,485,232	\$2,324,863.63	
8	31/03/2019	\$21,000,000	31/03/2020	\$20,381,420.99	\$20,381,420.99	\$22,210,794	2	\$22,210,794	\$2,345,024.34	
9	30/04/2019	\$18,000,000	30/04/2020	\$20,464,184.43	\$20,464,184.43	\$19,687,693	2	\$19,687,693	\$2,363,236.83	
10	31/05/2019	\$22,000,000	31/05/2020	\$20,549,706.66	\$20,549,706.66	\$22,497,359	2	\$22,497,359	\$2,383,091.05	
11	30/06/2019	\$20,000,000	30/06/2020	\$20,632,470.11	\$20,632,470.11	\$19,974,258	2	\$19,974,258	\$2,401,572.75	
12	31/07/2019	\$20,000,000	31/07/2020	\$20,717,992.33	\$20,717,992.33	\$22,783,924	2	\$22,783,924	\$2,421,711.59	
13	31/08/2019	\$16,000,000	31/08/2020	\$20,803,514.56	\$20,803,514.56	\$20,176,720	2	\$20,176,720	\$2,441,080.66	
14	30/09/2019	\$22,000,000	30/09/2020	\$20,886,278.01	\$20,886,278.01	\$22,977,141	2	\$22,977,141	\$2,460,241.07	
15	31/10/2019	\$19,000,000	31/10/2020	\$20,971,800.24	\$20,971,800.24	\$20,463,285	2	\$20,463,285	\$2,480,515.73	
16	30/11/2019	\$21,000,000	30/11/2020	\$21,054,563.68	\$21,054,563.68	\$23,263,706	2	\$23,263,706	\$2,499,934.56	
17	31/12/2019	\$20,000,000	31/12/2020	\$21,140,085.91	\$21,140,085.91	\$20,749,850	2	\$20,749,850	\$2,520,483	
18										

FORECAST C FORECAST

6:31 / 7:09

Average: \$2,412,439.64 Count: 12 Sum: \$28,949,275.68

# Case 2



# References

- [https://www.selecthub.com/business-intelligence/predictive-descriptive-prescriptive-analytics/#What\\_Are\\_Descriptive\\_Analytics](https://www.selecthub.com/business-intelligence/predictive-descriptive-prescriptive-analytics/#What_Are_Descriptive_Analytics)
- [https://www.youtube.com/watch?v=Zo\\_qcw7Etrk](https://www.youtube.com/watch?v=Zo_qcw7Etrk)
- <https://www.youtube.com/watch?v=1xw915rbyG4&t=449s>
- <https://www.youtube.com/watch?v=tdV9L3C-hxQ>
- <https://www.youtube.com/watch?v=HUOGljIM1FA>