

DATA ANALYTICS WITH COGNOS

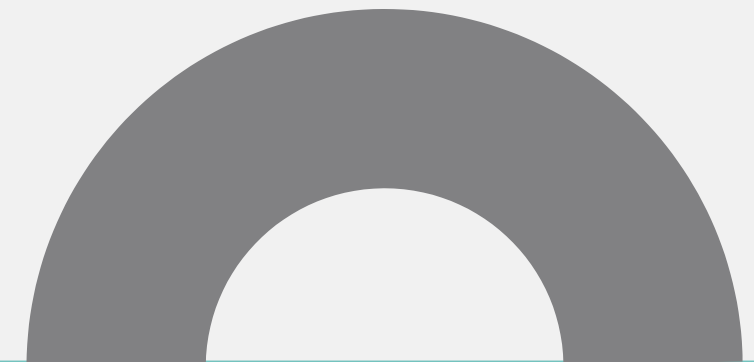
**CONSIDER INCORPORATING MACHINE LEARNING ALGORITHMS TO
PREDICT FUTURE SALES TRENDS OR CUSTOMER BEHAVIOUR.**

PHASE 2

NAME: PREETHI.G

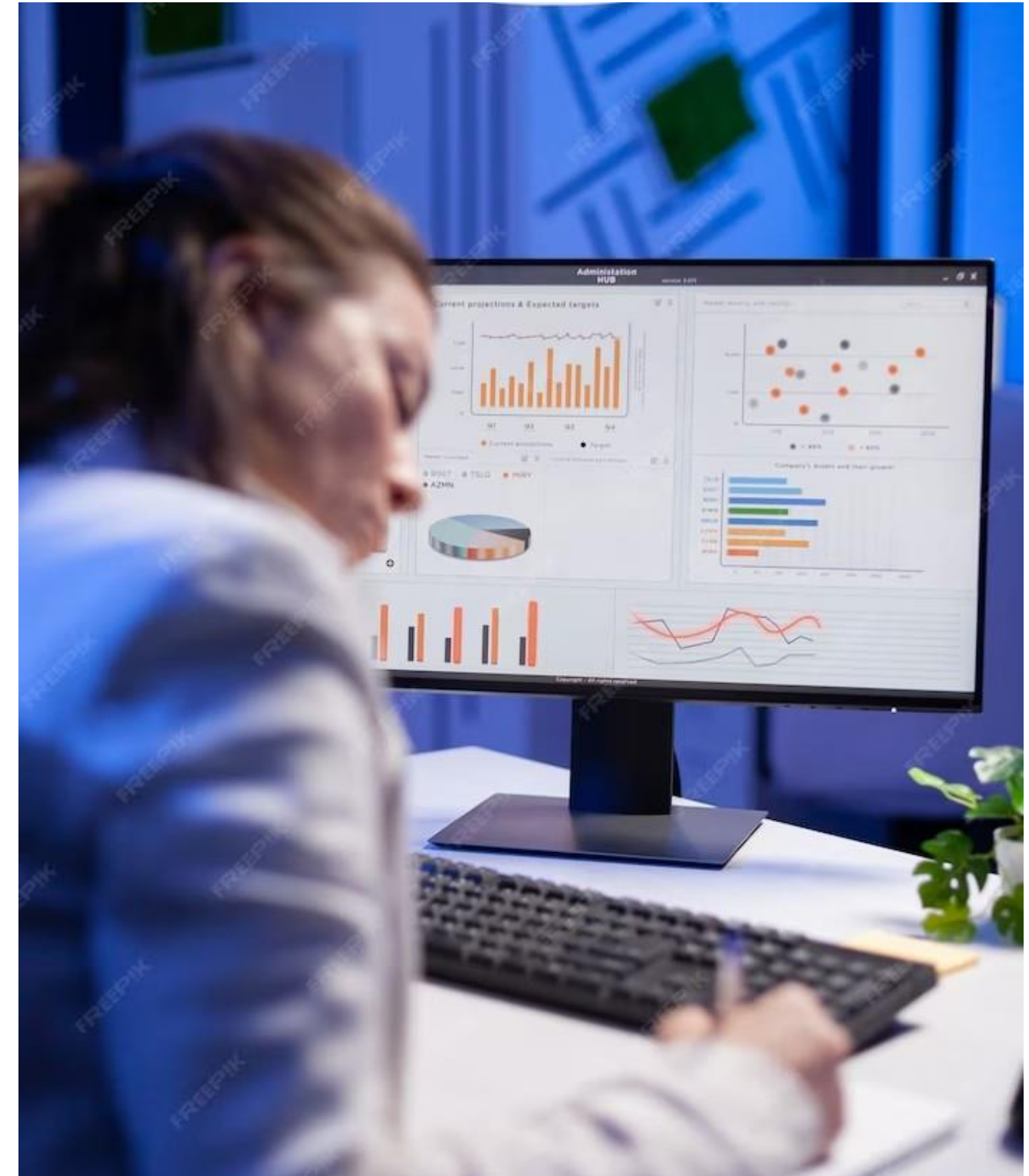
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INTRODUCTION

Predicting future sales involves using historical data, statistical algorithms, machine learning algorithms techniques to analyze past sales data patterns and make projections about future sales performance.



PREDICTION SALES PROCESS

DATA COLLECTION

Gather relevant data. This could include historical sales data, customer demographics, website interactions, social media engagement, or any other data points that might influence customer behavior.



DATA PREPROCESSING

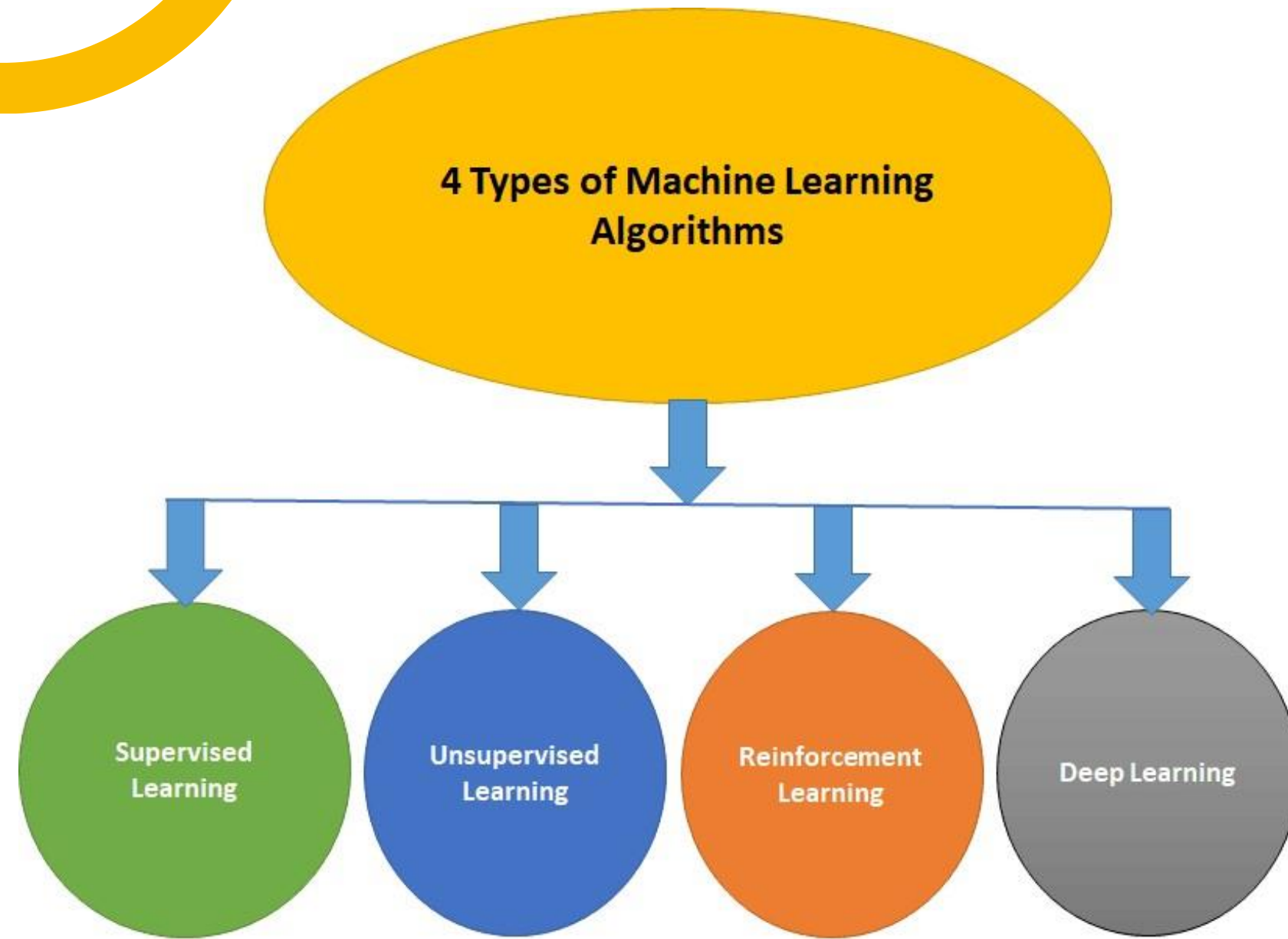
Clean and preprocess the data. This step involves handling missing values, outlier detection, data normalization, and converting categorical variables into numerical formats if necessary.

FEATURE SELECTION

:Identify the most important features that might affect your predictions. Feature selection techniques like correlation analysis or feature importance from tree-based algorithms can be helpful.



TYPES OF MACHINE LEARNING



There are three main types of machine learning algorithms: supervised, unsupervised, and reinforcement learning. Supervised learning involves training an algorithm on labeled data, while unsupervised learning involves finding patterns in unlabeled data. Reinforcement learning involves training an algorithm to make decisions based on rewards and punishments.

Sales Analysis

Set up for success with sales analysis methods and techniques



IMPLEMENTING MACHINE LEARNING IN SALES

To implement machine learning in sales, businesses need to **gather and clean data**, choose the right **algorithms**, and **train and test** the models. It's important to have a **data-driven culture** and to involve sales teams in the process. With the right approach, businesses can see significant improvements in their sales performance.

BENEFITS OF MACHINE LEARNING

Machine learning can help businesses make **data-driven decisions**, improve **sales forecasting**, and identify **high-quality leads**. By automating routine tasks, sales teams can focus on building relationships with customers and closing deals.



```

# Import necessary libraries import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestRegressor
from sklearn.metrics import mean_squared_error
from sklearn.preprocessing import LabelEncoder
# Load the dataset data=
pd.read_csv('product_sales_data.csv')
# Convert categorical variables (if any) to numerical
using Label Encoding label_encoders = {} for column in
['Product_ID', 'Warehouse_ID', 'Product_Category']:
label_encoders[column] = LabelEncoder()
data[column] =
label_encoders[column].fit_transform(data[column])
# Split the data into features (X) and target (y) X =
data.drop('Order_Demand', axis=1) y =
data['Order_Demand']
# Split the data into training and testing sets X_train,
X_test, y_train, y_test = train_test_split(X, y,
test_size=0.2, random_state=42)



```

LINE OF CODE

```

new_data_encoded = new_data.copy()
)# for column in ['Product_ID', 'Warehouse_ID',
'Product_Category']: # new_data_encoded[column]
label_encoders[column].transform(new_data[column])
# future_sales = model.predict(new_data_encoded)
# Initialize and train the Random Forest Regressor model model
= RandomForestRegressor(n_estimators=100, random_state=42)
model.fit(X_train, y_train)
# Make predictions on the test set predictions =
model.predict(X_test)
# Evaluate the model mse = mean_squared_error(y_test,
predictions) print('Mean Squared Error:', mse)
# Now, you can use this model to predict future sales by providing
new data points
# For example, assuming you have a new_data DataFrame


```

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from sklearn.metrics import mean_squared_error
from sklearn.preprocessing import LabelEncoder

# Load the dataset
data = pd.read_csv('product_sales_data.csv')

# Data preprocessing
# Convert categorical variables (if any) to numerical using Label Encoding
label_encoders = {}
for column in ['Product_ID', 'Warehouse_ID', 'Product_Category']:
    label_encoders[column] = LabelEncoder()
    data[column] = label_encoders[column].fit_transform(data[column])
```



CONCLUSION

Machine learning is transforming the sales industry by providing real-time insights and automating routine tasks. By using machine learning algorithms, businesses can make data-driven decisions, improve sales performance, and increase revenue. With the right approach, machine learning can help businesses stay ahead of the competition and achieve long-term success.

