Assignment 1

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1. Importing required libraries.

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import sklearn
```

2. Reading .csv file with pandas and creating DataFrame.

```
data = pd.read_csv('Salary_Data.csv')
df = pd.DataFrame(data)
Df
```

3. Ceating a model with LinerRegression.

```
from sklearn.linear_model import LinearRegression
model = LinearRegression()
```

4. Splitting data into training and sest data.

```
x = df['YearsExperience']
y = df['Salary']
x = np.array(x).reshape(-1, 1)
y = np.array(y).reshape(-1, 1)


from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(x, y, test_size=0.2, random_state=42)
```

5. Teaching/Fitting model our data.

```
model.fit(X_train, y_train)
```

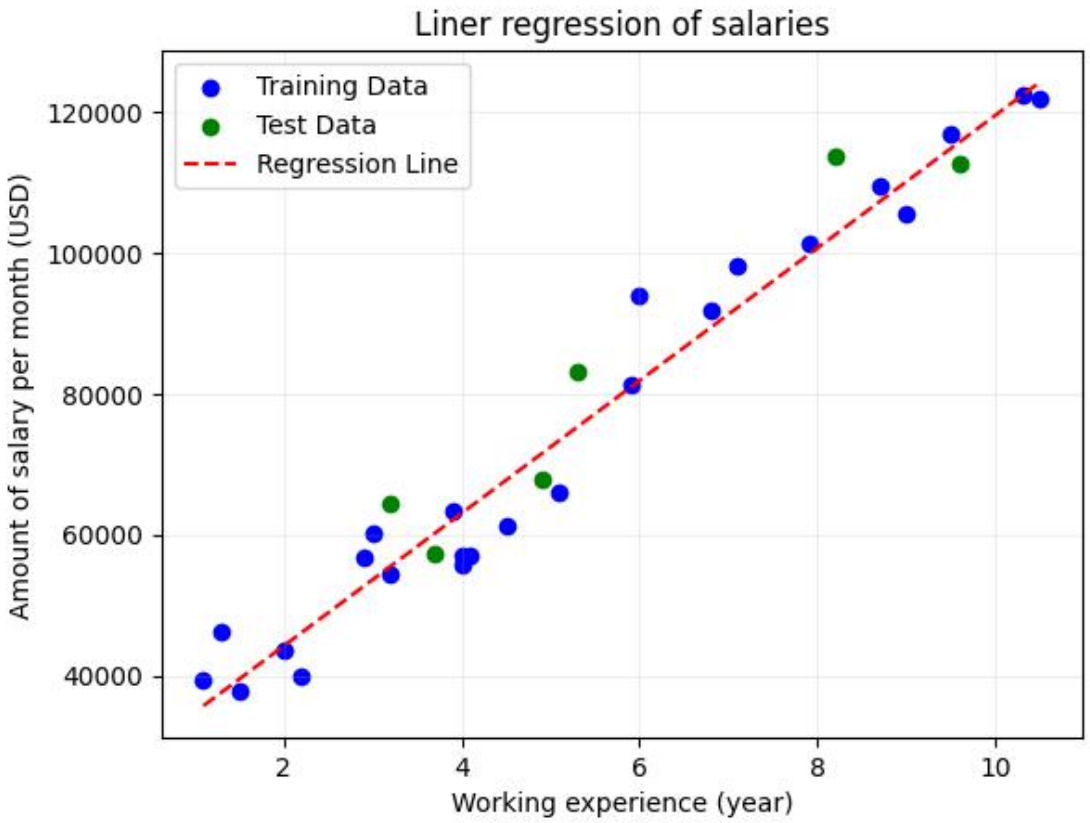
6. Testing model with test data.

```
y_pred = model.predict(X_test)
print("Test Data (X_test):", X_test.flatten())
print("Actual Cost (y_test):", y_test)
print("Predicted Cost (y_pred):", y_pred)
```

7. Plotting results and data with matplotlib.

```
plt.scatter(X_train, y_train, c='blue', label='Training Data')
plt.scatter(X_test, y_test, c='green', label='Test Data')
plt.plot(x, model.predict(x), c='red', ls='--', label='Regression Line')
plt.xlabel('Working experience (year)')
plt.ylabel('Amount of salary per month (USD)')
plt.title('Liner regression of salaries')
plt.legend()
plt.grid(alpha=0.2)
plt.show()
```

#Outpu:



8. Working with another data.

```
print(model.predict([[10.2]]))
print(model.predict([[2.6]]))
```

#Output:

```
[[121444.49930669]]
[[49823.50285166]]
```

9. Working with errors.

```
from sklearn.metrics import mean_squared_error, r2_score
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)

print(f"Mean Squared Error (MSE): {mse:.2f}")
print(f"R² Score: {r2:.4f}")
```

#Output:

```
Mean Squared Error (MSE): 49830096.86
R² Score: 0.9024
```