Machine Learning

Assignment 1: Linear Regression

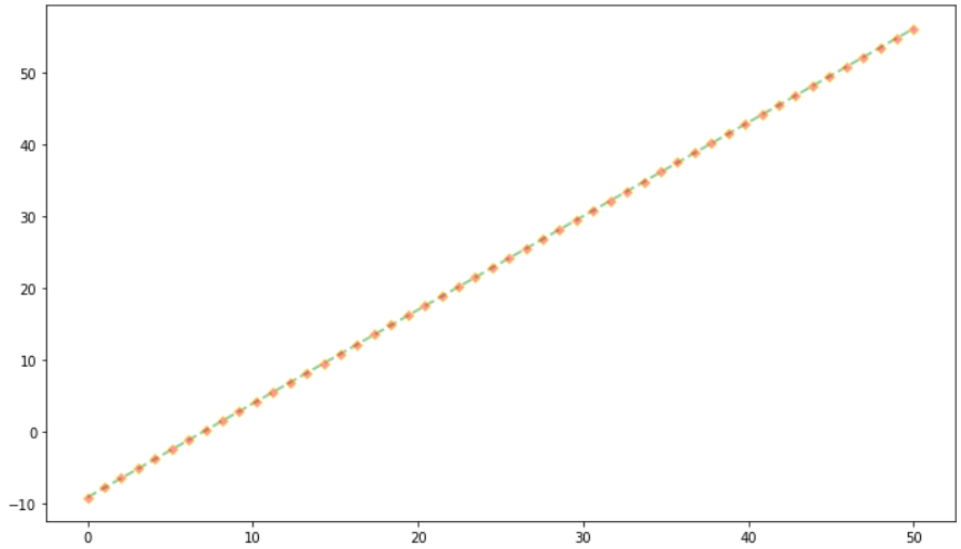
Code:

```
#21BCE8421
#Harshita P
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
#The independent variable: Temperature
x=[20,25,30,35,40]
xar=np.array(x)
print("Temperatures: ",xar)
#The independent variable: Coffee consumption
y=[45,37,28,22,18]
yar=np.array(y)
print("Amount of coffee consumption: ",yar)
xy=[]
for i in range(0,5):
 product=float(xar[i]*yar[i])
xy.append(product)
xyarr=np.array(xy)
print(xyarr)
xysum=sum(xyarr)
xsum=sum(xar)
ysum=sum(yar)
print("Xsum: ",xsum)
print("Ysum: ",ysum)
xsumysum=xsum*ysum
xsumsq=xsum*xsum
xsq=[]
for i in range(0,5):
  square=float(xar[i]*xar[i])
xsq.append(square)
xsqar=np.array(xsq)
xsqsum=sum(xsqar)
print("x^2 sum:",xsqsum)
numeratorm=(5*xysum)-(xsum*ysum)
denominatorm=(5*xsqsum)-xsumsq
slope=numeratorm/denominatorm
m=slope
print("The value of m:",slope)
numeratorc=(ysum)-(m*xsum)
denominatorc=5
c=numeratorc/denominatorc
```

```
print("The value of constant is ",c)
print("The equation of regression line is y=",m,"x+",c)
#the plotting part
x = np.linspace(0, 50)
y = m*x+c
fig=plt.figure(figsize=(12,7))
plt.plot(x, y, alpha = 0.4, label ='Y = X²', color ='green', linestyle
='dashed', linewidth = 2, marker ='D', markersize = 5, markerfacecolor
='red', markeredgecolor ='yellow')
print(np.interp(32, x,y))
plt.show()
```

Output:

```
Temperatures:  [20 25 30 35 40]
Amount of coffee consumption:  [45 37 28 22 18]
[720.]
Xsum:  150
Ysum:  150
x^2 sum: 1600.0
The value of m: 1.303448275862069
The value of constant is  -9.10344827586207
The equation of regression line is y= 1.303448275862069 x+ -9.10344827586207
32.606896551724134
```



Submitted By:

Harshita Pasupuleti

21BCE8421