In [1]:

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

Simple Regression Dataset - Straight Line Input Feature: X

Target: 5*X + 8 + some noise

Objective: Train a model to predict target for a given X

In [2]:

```
# Straight Line Function
def straight_line(x):
    return 5*x + 8
```

In [3]:

```
straight_line(25)
```

Out[3]:

```
133
```

In [4]:

```
straight_line(1.254)
```

Out[4]:

```
14.27
```

In [5]:

```
np.random.seed(5)

samples = 150
x = pd.Series(np.arange(0,150))
y = x.map(straight_line) + np.random.randn(samples)*10
```

In [6]:

```
df = pd.DataFrame({'x':x,'y':y})
```

In [7]:

```
df.head()
```

Out[7]:

	x	y
0	0	12.412275
1	1	9.691298
2	2	42.307712
3	3	20.479079
4	4	29.096098

In [8]:

```
# Correlation will indicate how strongly features are related to the output
df.corr()
```

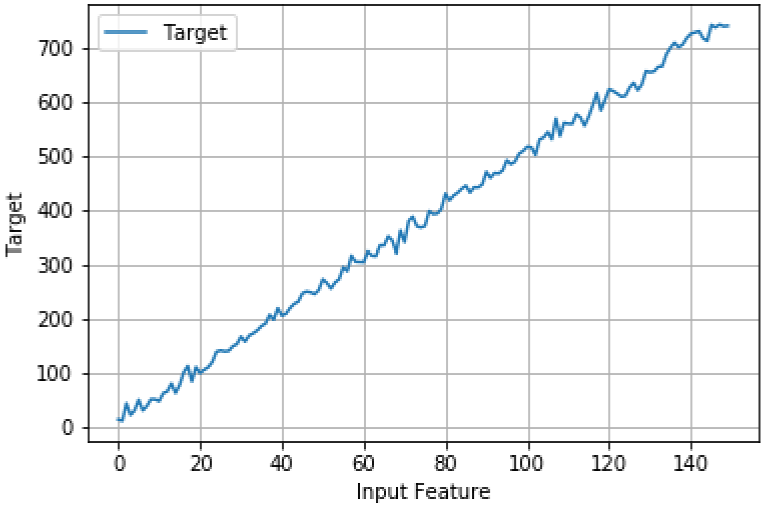
Out[8]:

	x	y
x	1.000000	0.998871
y	0.998871	1.000000

In [9]:

```

plt.plot(df.x,df.y,label='Target')
plt.grid(True)
plt.xlabel('Input Feature')
plt.ylabel('Target')
plt.legend()
plt.show()
```



In [10]:

```
# Save all data
df.to_csv(r'C:\Users\309962\Desktop\linear_all.csv',index=False,
          columns=['x','y'])
```

SageMaker Convention for Training and Validation files CSV File Column order: y_noisy, x

Training, Validation files do not have a column header

In [11]:

```
# Training = 70% of the data
# Validation = 30% of the data
# Randomize the datset
np.random.seed(5)
l = list(df.index)
np.random.shuffle(l)
df = df.iloc[l]
```

In [12]:

```
df.head()
```

Out[12]:

```
       x           y
 82   82  425.457270
134  134  687.275162
114  114  554.643782
 42   42  219.007382
109  109  560.269533
```

In [13]:

```
rows = df.shape[0]
train = int(.7 * rows)
test = rows - train
```

In [14]:

```
print(rows, train, test)
```

```
150 105 45
```

In [16]:

```

Write Training Set
f[:train].to_csv(r'C:\Users\309962\Desktop\linear_train.csv',index=False,header=Fa
```

In [19]:

```
# Write Validation Set
df[train:].to_csv(r'C:\Users\309962\Desktop\linear_validation.csv',index=False,he
```