```
#reading the csv files
import dask.dataframe as dd
import pandas as pd
import  inspect
import numpy as np
```

```
pdf=pd.read_csv(r'CleanDataset.csv')
pdf=pdf.iloc[:30000].copy()
pdf.shape
```

```
(25471, 4)
```

```
df=dd.from_pandas(pdf,npartitions=3)
```

```
#having a look at the head of the dataset
df.head()
```

	S_avg	Ds_avg	Ws_avg	Ot_avg
0	3.09000	88.180000	1.90	5.30
1	1.81000	23.010000	0.20	4.89
2	1.89000	38.110001	0.18	4.80
3	177.53000	1181.700000	5.04	1.79
4	191.96001	1200.480000	5.31	0.85

```
#finding the null values in the dataset
df.isnull().sum().compute()
df.describe()
```

Dask DataFrame Structure:

	S_avg	Ds_avg	Ws_avg	Ot_avg
npartitions=1				
	float64	float64	float64	float64
	...	...	...	...

Dask Name: describe, 73 tasks

```
!pip install dask-ml
```

```
Collecting dask-ml
  Downloading https://files.pythonhosted.org/packages/da/a4/3a54ca439a8d07d558
    |████████████████████████████████| 112kB 5.0MB/s
Collecting dask-glm (from dask-ml)
  Downloading https://files.pythonhosted.org/packages/cb/ee/36c6e0e7b51e08406e
Collecting multipledispatch>=0.4.9 (from dask-ml)
  Downloading https://files.pythonhosted.org/packages/89/79/429ecef45fd5e4504f
Requirement already satisfied: packaging in /usr/local/lib/python3.6/dist-pack
Requirement already satisfied: pandas>=0.23.4 in /usr/local/lib/python3.6/dist
Requirement already satisfied: scipy in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: scikit-learn>=0.20 in /usr/local/lib/python3.6/
Requirement already satisfied: numba in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: numpy in /usr/local/lib/python3.6/dist-packages
Requirement already satisfied: six in /usr/local/lib/python3.6/dist-packages (
Requirement already satisfied: dask[array]>=1.0.0 in /usr/local/lib/python3.6/
Requirement already satisfied: distributed>=1.25.0 in /usr/local/lib/python3.6
Requirement already satisfied: cloudpickle>=0.2.2 in /usr/local/lib/python3.6/
Requirement already satisfied: pyparsing>=2.0.2 in /usr/local/lib/python3.6/di
Requirement already satisfied: python-dateutil>=2.5.0 in /usr/local/lib/python
Requirement already satisfied: pytz>=2011k in /usr/local/lib/python3.6/dist-pa
Requirement already satisfied: llvmlite>=0.25.0dev0 in /usr/local/lib/python3.
Requirement already satisfied: toolz>=0.7.3; extra == "array" in /usr/local/li
Requirement already satisfied: psutil>=5.0 in /usr/local/lib/python3.6/dist-pa
Requirement already satisfied: zict>=0.1.3 in /usr/local/lib/python3.6/dist-pa
Requirement already satisfied: sortedcontainers!=2.0.0,!=2.0.1 in /usr/local/l
Requirement already satisfied: pyyaml in /usr/local/lib/python3.6/dist-package
Requirement already satisfied: tblib in /usr/local/lib/python3.6/dist-packages
```

```python
#defining the data and target
categorical_variables = df[['S_avg','Ws_avg','Ot_avg']]
target = df[['Ds_avg']]
```

```
Installing collected packages: multipledispatch, dask-glm, dask-ml
```

```python
#fit the model
from dask_ml.linear_model import LinearRegression
lr = LinearRegression()
lr.fit(categorical_variables.values, target.values)
```

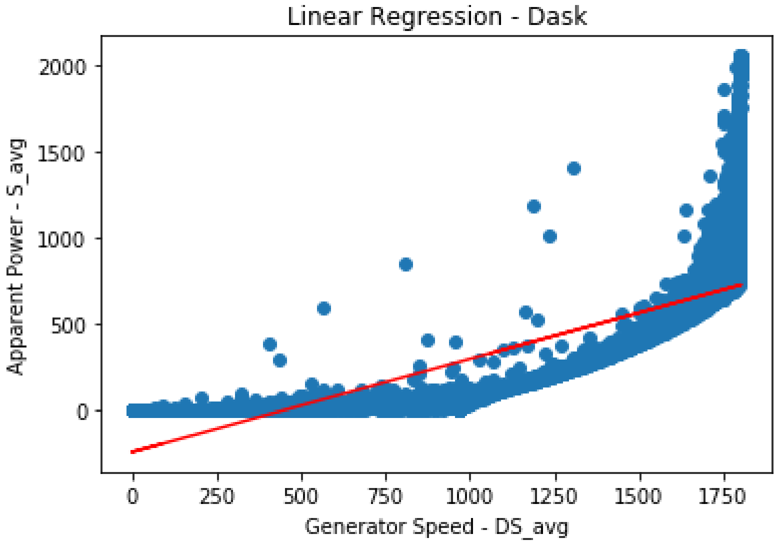
```
LinearRegression(C=1.0, class_weight=None, dual=False, fit_intercept=True,
         intercept_scaling=1.0, max_iter=100, multi_class='ovr', n_jobs=1,
         penalty='l2', random_state=None, solver='admm',
         solver_kwargs=None, tol=0.0001, verbose=0, warm_start=False)
```

```python
#Compute mean sqaured error

from dask_ml.metrics import mean_squared_error
q = mean_squared_error(target.values,lr.predict(categorical_variables.values))

# printing the value of mean sqaured error
q
```

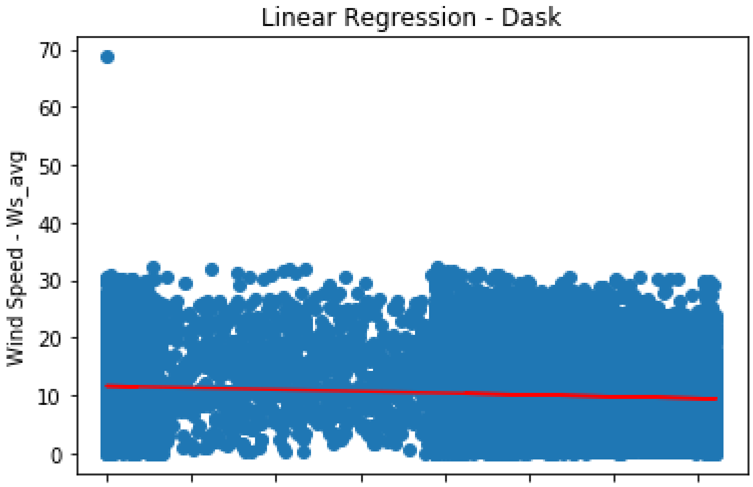
```
575568.3921570351
```

```python
# importing the matplot libraries

import matplotlib.pyplot as plt
%matplotlib inline
```

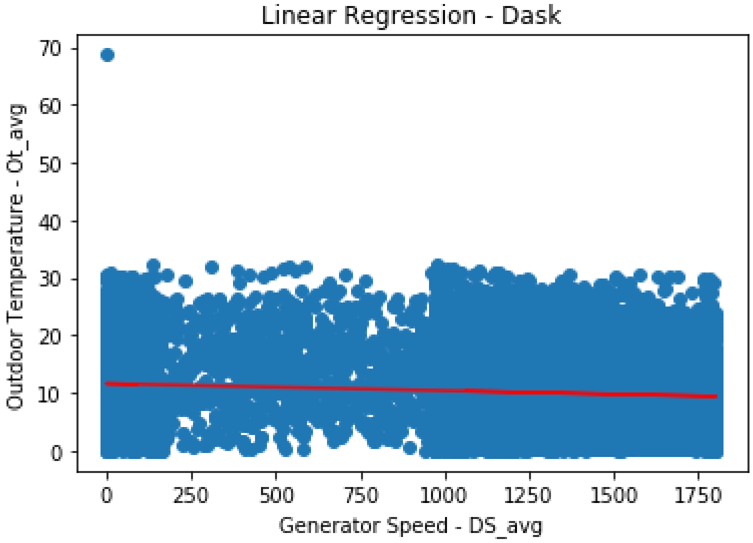
```
# Ds_avg vs S_avg
X= pdf.iloc[:, 1].values.reshape(-1, 1)  # values converts it into a numpy array
Y = pdf.iloc[:, 0].values.reshape(-1, 1)  # -1 means that calculate the dimension of
lr.fit(X, Y) # perform linear regression
Y_pred = lr.predict(X)  # make predictions
plt.scatter(X, Y)
plt.xlabel('Generator Speed - DS_avg')
plt.ylabel('Apparent Power - S_avg')
plt.title('Linear Regression - Dask')
plt.plot(X, Y_pred, color='red')
plt.show()
```



```
# Ds_avg vs Ws_avg

X= pdf.iloc[:, 1].values.reshape(-1, 1)  # values converts it into a numpy array
Y = pdf.iloc[:, 3].values.reshape(-1, 1)  # -1 means that calculate the dimension of
lr.fit(X, Y) # perform linear regression
Y_pred = lr.predict(X)  # make predictions
plt.scatter(X, Y)
plt.plot(X, Y_pred, color='red')
plt.xlabel('Generator Speed - DS_avg')
plt.ylabel('Wind Speed - Ws_avg')
plt.title('Linear Regression - Dask')
plt.show()
```



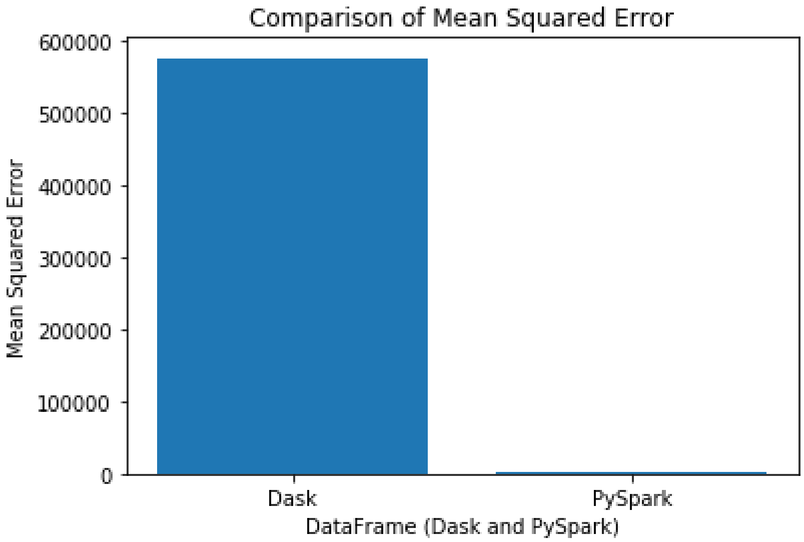
```
# Ds_avg vs Ot_avg

X= pdf.iloc[:, 1].values.reshape(-1, 1)  # values converts it into a numpy array
Y = pdf.iloc[:, 3].values.reshape(-1, 1)  # -1 means that calculate the dimension of
lr.fit(X, Y) # perform linear regression
Y_pred = lr.predict(X)  # make predictions
plt.scatter(X, Y)
plt.xlabel('Generator Speed - DS_avg')
plt.ylabel('Outdoor Temperature - Ot_avg')
plt.title('Linear Regression - Dask')
plt.plot(X, Y_pred, color='red')
plt.show()
```



```
# Mean squared error form pyspark and dask linear regression models

pySparkMean = 1107.1379084754542

daskMean = q
```

```
#Comparison of Mean squared Error between pyspark and dask linear regression models

import matplotlib.pyplot as plt
%matplotlib inline
x=np.arange(2)
rms=[daskMean,pySparkMean]
plt.bar(x,rms)
plt.xticks(x,["Dask","PySpark"])
plt.xlabel('DataFrame (Dask and PySpark)')
plt.ylabel('Mean Squared Error')
plt.title('Comparison of Mean Squared Error')
```

```
Text(0.5, 1.0, 'Comparison of Mean Squared Error')
```


Comparison of Mean Squared Error
Mean Squared Error
Dask
PySpark
DataFrame (Dask and PySpark)