Lab 4 report

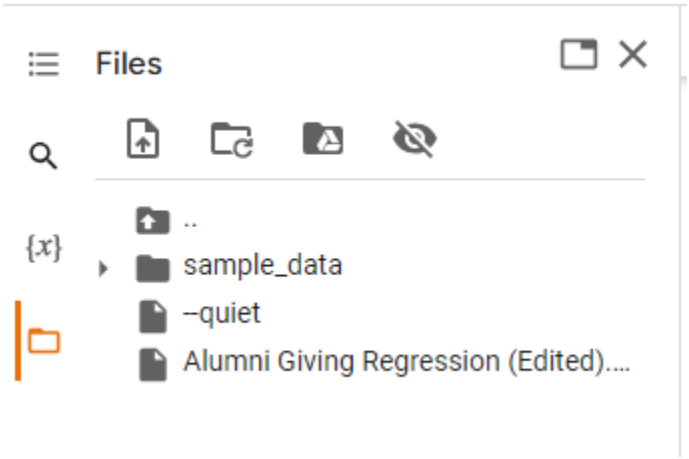
Task 1:

```
from keras.models import Sequential
from keras.layers import Dense, Dropout
from sklearn.metrics import classification_report, confusion_matrix
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error
import numpy as np
from sklearn import linear_model
from sklearn import preprocessing
from sklearn import tree
from sklearn.ensemble import
RandomForestRegressor,GradientBoostingRegressor
import pandas as pd
import csv

!wget
https://www.dropbox.com/s/veak3ugc4wj9luz/Alumni%20Giving%20Regression%20%
28Edited%29.csv?dl=0 -O--quiet "./Alumni Giving Regression (Edited).csv"

np.random.seed(7)

df = pd.read_csv("Alumni Giving Regression (Edited).csv", delimiter = ",")
df.head()
```



	A	B	C	D	E	F
0	24	0.42	0.16	0.59	0.81	0.08
1	19	0.49	0.04	0.37	0.69	0.11
2	18	0.24	0.17	0.66	0.87	0.31
3	8	0.74	0.00	0.81	0.88	0.11
4	8	0.95	0.00	0.86	0.92	0.28

```
df.describe()
```

	A	B	C	D	E	F
count	123.000000	123.000000	123.000000	123.000000	123.000000	123.000000
mean	17.772358	0.403659	0.136260	0.645203	0.841138	0.141789
std	4.517385	0.133897	0.060101	0.169794	0.083942	0.080674
min	6.000000	0.140000	0.000000	0.260000	0.580000	0.020000
25%	16.000000	0.320000	0.095000	0.505000	0.780000	0.080000
50%	18.000000	0.380000	0.130000	0.640000	0.840000	0.130000
75%	20.000000	0.460000	0.180000	0.785000	0.910000	0.170000
max	31.000000	0.950000	0.310000	0.960000	0.980000	0.410000

```
corr=df.corr(method ='pearson')
corr
```

	A	B	C	D	E	F
A	1.000000	-0.691900	0.414978	-0.604574	-0.521985	-0.549244
B	-0.691900	1.000000	-0.581516	0.487248	0.376735	0.540427
C	0.414978	-0.581516	1.000000	0.017023	0.055766	-0.175102
D	-0.604574	0.487248	0.017023	1.000000	0.934396	0.681660
E	-0.521985	0.376735	0.055766	0.934396	1.000000	0.647625
F	-0.549244	0.540427	-0.175102	0.681660	0.647625	1.000000

```
Y_POSITION = 5
model_1_features = [i for i in range(0,Y_POSITION)]
X = df.iloc[:,model_1_features]
Y = df.iloc[:,Y_POSITION]
X_train, X_test, y_train, y_test = train_test_split(X, Y, test_size=0.20,
random_state=2020)
```

```
2023-10-19 11:42:13 (1.97 GB/s) - '--quiet' saved [3504/3504]

--2023-10-19 11:42:13--  http://./Alumni%20Giving%20Regression%20(Edited).csv
Resolving . (.)... failed: No address associated with hostname.
wget: unable to resolve host address '.'
FINISHED --2023-10-19 11:42:13--
Total wall clock time: 1.2s
Downloaded: 1 files, 3.4K in 0s (1.97 GB/s)
```

Linear Regression:

```
# Model 1 linear regression

model1 = linear_model.LinearRegression()
model1.fit(X_train, y_train)
y_pred_train1 = model1.predict(X_train)
print("Regression")
print("================================")
RMSE_train1 = mean_squared_error(y_train,y_pred_train1)
print("Regression Train set: RMSE ".format(RMSE_train1))
```

```
print("================================")
y_pred1 = model1.predict(X_test)
RMSE_test1 = mean_squared_error(y_test,y_pred1)
print("Regression Test set: RMSE ".format(RMSE_test1))
print("================================")
coef_dict = {}
for coef, feat in zip(model1.coef_,model_1_features):
coef_dict[df.columns[feat]] = coef
print(coef_dict)
```

```
Regression
============================
Regression Train set: RMSE
============================
Regression Test set: RMSE
============================
{'A': -0.0009337757382416938, 'B': 0.16012156890162943, 'C': -0.044160015425349614, 'D': 0.15217907817100407, 'E': 0.17539950794101047}
```