Practical Number: 1A

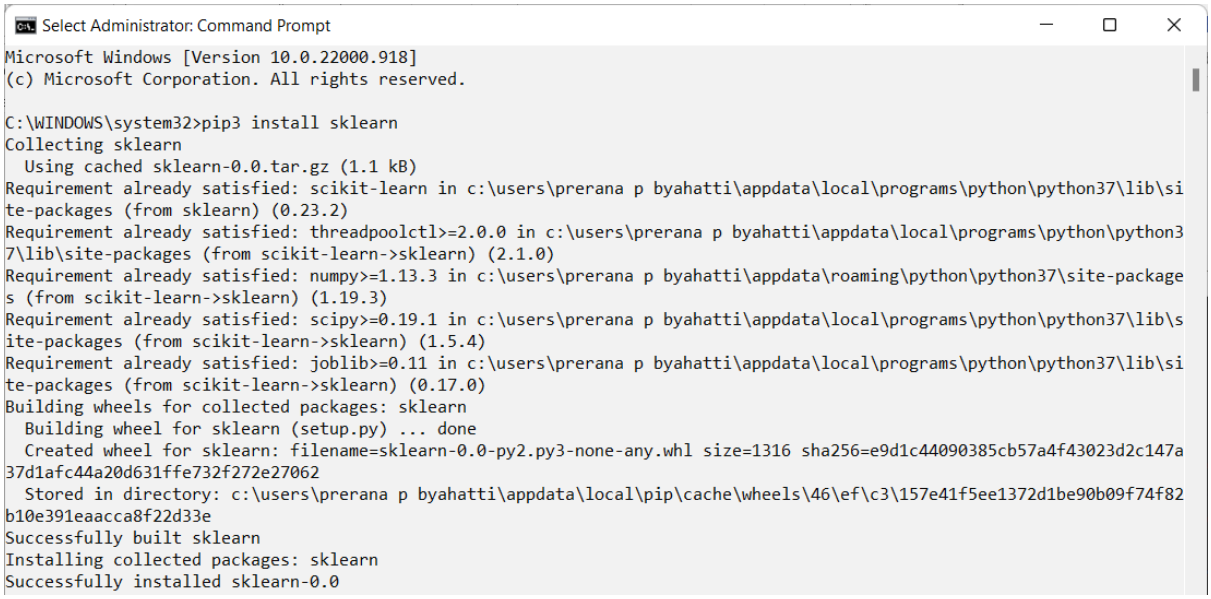
Aim: Design a simple machine learning model to train the training instances and test the same using Python**.**

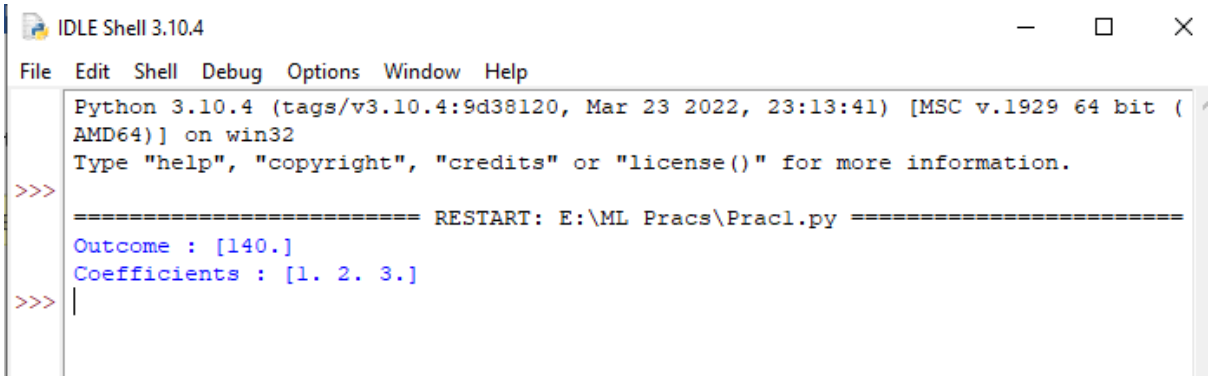
Code:

```
# python library to generate random numbers
from random import randint

# the limit within which random numbers are generated
TRAIN_SET_LIMIT = 1000

# to create exactly 100 data items
TRAIN_SET_COUNT = 100

# list that contains input and corresponding output
TRAIN_INPUT = list()
TRAIN_OUTPUT = list()

# loop to create 100 data  items with three columns each
for i in range(TRAIN_SET_COUNT):
    a = randint(0, TRAIN_SET_LIMIT)
    b = randint(0, TRAIN_SET_LIMIT)
    c = randint(0, TRAIN_SET_LIMIT)

# creating the output for each data item
    op = a + (2 * b) + (3 * c)
    TRAIN_INPUT.append([a, b, c])

# adding each output to output list
    TRAIN_OUTPUT.append(op)

# Sk-Learn contains the linear regression model
# To install sklearn package in python type in command prompt: pip3 install sklearn
from sklearn.linear_model import LinearRegression

# Initialize the linear regression model
# n_jobs int, default=None : The number of jobs to use for the computation.
# This will only provide speedup in case of sufficiently large problems.
# -1 means using all processors
predictor = LinearRegression(n_jobs =-1)

# Fill the Model with the Data
predictor.fit(X = TRAIN_INPUT, y = TRAIN_OUTPUT)

# Random Test data
X_TEST = [[ 10, 20, 30 ]]
```

```
# Predict the result of X_TEST which holds testing data
# predict() function enables us to predict the labels of the data values on the basis of the trained model.
outcome = predictor.predict(X = X_TEST)

# Predict the coefficients
coefficients = predictor.coef_

# Print the result obtained for the test data
print('Outcome : {}\nCoefficients : {}'.format(outcome, coefficients))
```

Output:





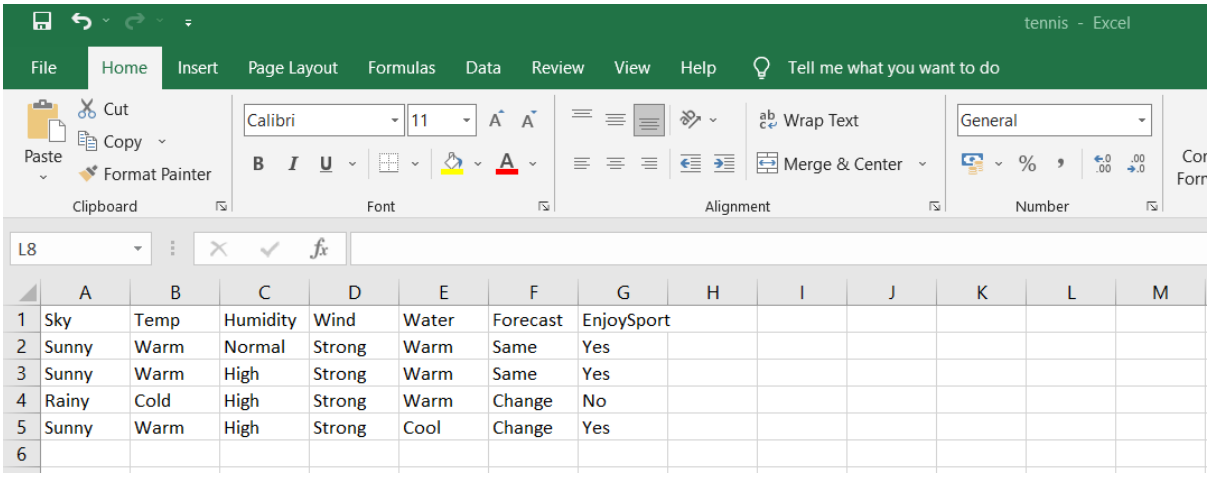
Practical Number: 1B

Aim: Implement and demonstrate the FIND-S algorithm for finding the most specific hypothesis based on a given set of training data samples. Read the training data from a .CSV file.

Code:

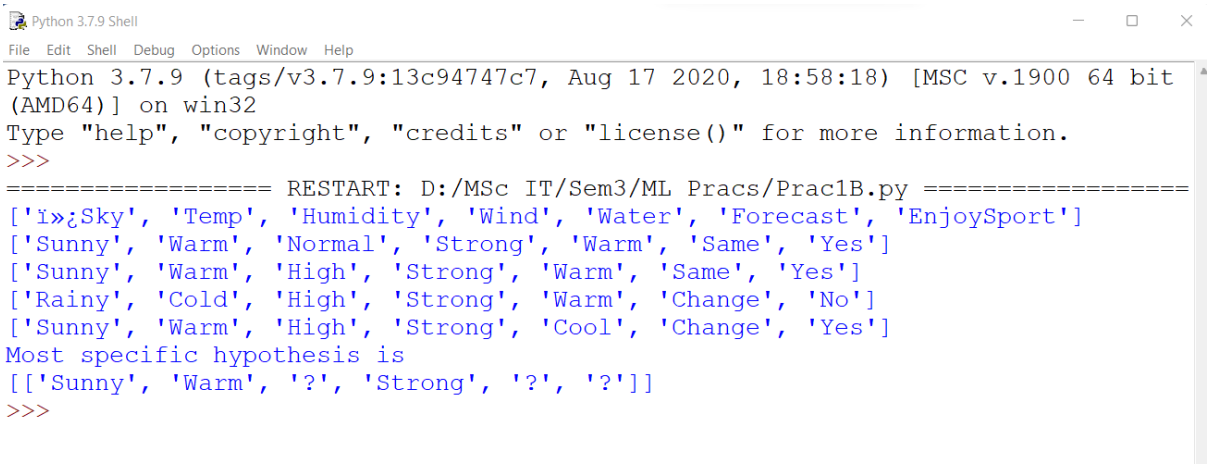
```
import csv
with open('tennis.csv', 'r') as f:
    reader = csv.reader(f)
    your_list = list(reader)
h = [['0', '0', '0', '0', '0', '0']]
for i in your_list:
    print(i)
    if i[-1]=="Yes":
        j=0
        for x in i:
            if x!="Yes":
                if x!=h[0][j] and h[0][j]=='0':
                    h[0][j]=x
                elif x!=h[0][j] and h[0][j]!='0':
                    h[0][j]='?'
                else:
                    pass
            j=j + 1
print("Most specific hypothesis is")
print(h)
```

tennis.csv file



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Sky	Temp	Humidity	Wind	Water	Forecast	EnjoySport						
2	Sunny	Warm	Normal	Strong	Warm	Same	Yes						
3	Sunny	Warm	High	Strong	Warm	Same	Yes						
4	Rainy	Cold	High	Strong	Warm	Change	No						
5	Sunny	Warm	High	Strong	Cool	Change	Yes						
6													

Output:



1 . Describe the forward selection algorithm for implementing subset selection procedure for dimensionally refunction

2. Describe the backward selection algorithm for implementing subset selection procedure for dimensionally refunction