



Vidyavardhini's College of Engineering & Technology

Department of Computer Engineering

Experiment No. 11
Program to demonstrate data frame creation and Manipulation using Pandas
Date of Performance:
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Experiment No. 11

Title: Program to demonstrate data frame creation and Manipulation using Pandas

Aim: To study and implement data frame creation and Manipulation using Pandas

Objective: To introduce Pandas package for python

Theory:

Pandas is an open-source library that is built on top of NumPy library. It is a Python package that offers various data structures and operations for manipulating numerical data and time series. It is mainly popular for importing and analyzing data much easier. Pandas is fast and it has high-performance & productivity for users.

Installation of Pandas

If you have [Python](#) and [PIP](#) already installed on a system, then installation of Pandas is very easy.

Install it using this command:

```
C:\Users\Your Name>pip install pandas
```

If this command fails, then use a python distribution that already has Pandas installed like, Anaconda, Spyder etc.

Import Pandas

Once Pandas is installed, import it in your applications by adding the **import** keyword:

```
import pandas
```

Now Pandas is imported and ready to use.

Example

Code:

```
import pandas  
mydataset = {
```



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```
'Fruit': ["Orange", "apple", "mango"],
'passings': [8, 3, 2]
}
myvar = pandas.DataFrame(mydataset)
print(myvar)
```

OUTPUT:

```
   Fruit  passings
0  Orange         8
1   apple         3
2   mango         2
```

Pandas is usually imported under the **pd** alias.

alias: In Python alias are an alternate name for referring to the same thing.

Create an alias with the **as** keyword while importing:

```
import pandas as pd
```

Now the Pandas package can be referred to as **pd** instead of **pandas**.

Example

```
import pandas as pd
```

```
mydataset = {
    'Fruit': ["Orange", "apple", "mango"],
    'passings': [8, 3, 2]
}
```

```
myvar = pd.DataFrame(mydataset)
```

```
print(myvar)
```

Checking Pandas Version

The version string is stored under **__version__** attribute.



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Example

```
import pandas as pd  
  
print(pd.__version__)
```

Output:

2.0.3

What is a Series?

A Pandas Series is like a column in a table.

It is a one-dimensional array holding data of any type.

Example

Create a simple Pandas Series from a list:

```
import pandas as pd  
  
a = [1, 7, 2]  
  
myvar = pd.Series(a)  
  
print(myvar)
```

```
0    1  
1    7  
2    2  
dtype: int64
```

Labels

If nothing else is specified, the values are labeled with their index number. First value has index 0, second value has index 1 etc.

This label can be used to access a specified value.

Example

Return the first value of the Series:



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```
print(myvar[0])
```

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Create Labels

With the **index** argument, you can name your own labels.

Example

Create your own labels:

```
import pandas as pd
a = [7, 5, 8]
myvar = pd.Series(a, index = ["a", "b", "c"])
print(myvar)
```

a	7
b	5
c	8

dtype: int64

When you have created labels, you can access an item by referring to the label.

Example

Return the value of "y":

```
print(myvar["y"])
```

Key/Value Objects as Series

You can also use a key/value object, like a dictionary, when creating a Series.

Example

Create a simple Pandas Series from a dictionary:



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```
import pandas as pd
```

```
calories = {"day1": 420, "day2": 380, "day3": 390}
```

```
myvar = pd.Series(calories)
```

```
print(myvar)
```

```
day1    420  
day2    380  
day3    390  
dtype: int64
```

To select only some of the items in the dictionary, use the **index** argument and specify only the items you want to include in the Series.

Example

Create a Series using only data from "day1" and "day2":

```
import pandas as pd
```

```
calories = {"day1": 420, "day2": 380, "day3": 390}
```

```
myvar = pd.Series(calories, index = ["day1", "day2"])
```

```
print(myvar)
```

```
day1    420  
day2    380  
dtype: int64
```

DataFrames

Data sets in Pandas are usually multi-dimensional tables, called DataFrames.

Series is like a column, a DataFrame is the whole table.

Example

Create a DataFrame from two Series:

```
import pandas as pd
```

```
data = {  
    "calories": [420, 380, 390],
```



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```
"duration": [50, 40, 45]
}

myvar = pd.DataFrame(data)

print(myvar)
```

	calories	duration
0	420	50
1	380	40
2	390	45

Read CSV Files

A simple way to store big data sets is to use CSV files (comma separated files).

CSV files contains plain text and is a well know format that can be read by everyone including Pandas.

In our examples we will be using a CSV file called 'data.csv'.

Example

Load the CSV into a DataFrame:

```
import pandas as pd

df = pd.read_csv('data.csv')

print(df.to_string())
```

Example:

Print the DataFrame without the `to_string()` method:

```
import pandas as pd

df = pd.read_csv('data.csv')

print(df)
```



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max_rows

The number of rows returned is defined in Pandas option settings.

You can check your system's maximum rows with the `pd.options.display.max_rows` statement.

Example

Check the number of maximum returned rows:

```
import pandas as pd

print(pd.options.display.max_rows)
```

```
import pandas as pd

print(pd.options.display.max_rows)

60
```

Example

Increase the maximum number of rows to display the entire DataFrame:

```
import pandas as pd

pd.options.display.max_rows = 9999

df = pd.read_csv('data.csv')

print(df)
```

Code:

```
import pandas as pd

df = pd.read_csv('data.csv')

print("Original DataFrame:")

print(df)

print()

df['Average'] = df[['quiz1-marks', 'quiz2-marks', 'quiz3-marks']].mean(axis=1)
```


