



ATMIYA University

Faculty of Science

Department of Computer Application

Master of Computer Application

Code :-23PGCA207 | Subject-Name:- Programming With Python

Enrollment No:=230823007 | Name:-Jainish Barbhaya

Practice Set 6

1.) Create a file with file name sample.txt, accept some data from the user and store it in the file.

```
filename = "sample.txt"
```

```
data = input("Enter data to store in the file: ")
```

```
with open(filename, 'w') as file:
```

```
    file.write(data)
```

output:=

Enter data to store in the file: hiiiiiiiiiii helo hoe are you.

2.) Display the data stored in the sample.txt file (created in question 1).

```
with open(filename, 'r') as file:
```

```
    file_data = file.read()
```

```
    print("Data stored in sample.txt:", file_data)
```

output:=

Data stored in sample.txt: hiiiiiiiiiii helo hoe are you.



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3.) Accept some data from the user and append it into the file sample.txt (created in question 1), also the data in the file.

```
additional_data = input("Enter additional data to append: ")
```

```
with open(filename, 'a') as file:
```

```
    print("Data appended in sample.txt:", additional_data)
```

output:=

Enter additional data to append: hello good morning mojma.

Data appended in sample.txt: hello good morning mojma.

4.) Accept the file name from the user, check the availability of the file: i). If the file exists display the data on the screen, ii). If the file is not available, display the appropriate message.

```
user_file = input("Enter the file name to check: ")
```

```
try:
```

```
    with open(user_file, 'r') as file:
```

```
        file_data = file.read()
```

```
        print("Data stored in", user_file + ":", file_data)
```

```
except FileNotFoundError:
```

```
    print("File not found!")
```

output:=

Data stored in sample.txt: hiiiiiiiiiii helo hoe are you.

iiiiiiiiiii helo hoe are you.



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```
hi jbnm
lpmnjklo
```

5.) Accept the file name from the user, check the availability of the file:

- If the file exists, display: i). No. of characters, ii). No. of words and iii). No. of lines
- If the file does exist, than display the appropriate message.

```
user_file = input("Enter the file name to check: ")
```

```
try:
```

```
    with open(user_file, 'r') as file:
```

```
        char_count = len(file.read())
```

```
        file.seek(0)
```

```
        word_count = len(file.read().split())
```

```
        file.seek(0)
```

```
        line_count = len(file.readlines())
```

```
    print("File characteristics:")
```

```
    print("Number of characters:", char_count)
```

```
    print("Number of words:", word_count)
```

```
    print("Number of lines:", line_count)
```

```
except FileNotFoundError:
```

```
    print("File not found!")
```

```
output:=
```

```
Enter the file name to check: sample.txt
```

```
File characteristics:
```

```
Number of characters: 79
```



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Number of words: 13

Number of lines: 4

6.) Create and open the binary file with 'with' option. Store names of all the subjects you study in semester 2. Ask user to enter the subject number they wanted to see and display that subject name.

```
subjects = ["Java", "Python", "Laravel", "AWS", "Language and  
Numeric Method"] # Example subjects  
with open('semester2_subjects.bin', 'wb') as file:  
    for subject in subjects:  
        file.write(subject.encode() + b'\n')  
  
subject_number = int(input("Enter the subject number you want to  
see: "))  
with open('semester2_subjects.bin', 'rb') as file:  
    subjects = file.readlines()  
    if 1 <= subject_number <= len(subjects):  
        print(f"Subject {subject_number}:  
{subjects[subject_number - 1].decode().strip()}")  
    else:  
        print("Invalid subject number.")
```

output:=

Enter the subject number you want to see: 5

Subject 5: Language and Numeric Method



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7.) Create a file named 'img1', store an image into it. Open another file named 'img2', copy the same image as in the file 'img1'. Also store both files into the zip file named 'imp_img'.

```
import shutil
import zipfile

# Step 1: Store an image into 'img1'
# Assuming 'image.jpg' is the image file you want to store

shutil.copy('image.png', 'img1')

# Step 2: Open another file 'img2' and copy the same image as in
'img1'
shutil.copy('img1', 'img2')

#Step 3: Store both 'img1' and 'img2' files into the zip file
'imp_img'
with zipfile.ZipFile('imp_img.zip', 'w') as zipf:
    zipf.write('img1')
    zipf.write('img2')
```

8.) Create a file with 'with' option, name it as 'marks.dat'.

- Accept subject name and marks from the user, store the data in the file.
- Give three options to the user: a). To view whole file, b). Accept and edit the marks of a subject user want to change.
- Exit



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```
with open('marks.dat', 'w') as file:
    while True:
        choice = input("Enter subject name and marks you want to
enter or enter 'exit' to quit: ")
        if choice.lower() == 'menu':
            print("Menu:\n1. View whole file\n2. Edit marks of a
subject\n3. Exit")
        elif choice.lower() == 'exit':
            break
        else:
            file.write(choice + '\n')

# Display menu options
print("Menu:\n1. View whole file\n2. Edit marks of a subject\n3.
Exit")

# Handle user choices
while True:
    option = input("Enter your choice (1, 2, or 3): ")
    if option == '1':
        with open('marks.dat', 'r') as file:
            print(file.read())
    elif option == '2':
        subject_to_edit = input("Enter the subject name you want
to edit: ")
        new_marks = input("Enter the new marks: ")
        with open('marks.dat', 'r') as file:
            lines = file.readlines()
        with open('marks.dat', 'w') as file:
```



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```
for line in lines:
    if subject_to_edit in line:
        file.write(subject_to_edit + ',' + new_marks
+ '\n')
    else:
        file.write(line)
elif option == '3':
    print("Exiting...")
    break
else:
    print("Invalid choice. Please enter 1, 2, or 3.")
```

output:=

```
Enter subject name and marks you want to enter or enter 'exit'
to quit: MATH,90
Enter subject name and marks you want to enter or enter 'exit'
to quit: PYTHON,80
Enter subject name and marks you want to enter or enter 'exit'
to quit: AWS,70
Enter subject name and marks you want to enter or enter 'exit'
to quit: LARAVEL,60
Enter subject name and marks you want to enter or enter 'exit'
to quit: JAVA,50
Enter subject name and marks you want to enter or enter 'exit'
to quit: J2EE,40
Enter subject name and marks you want to enter or enter 'exit'
to quit: C++,30
Enter subject name and marks you want to enter or enter 'exit'
to quit: exit
```



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Menu:

1. View whole file

2. Edit marks of a subject

3. Exit

Enter your choice (1, 2, or 3): 1

MATH,90

PYTHON,80

AWS,70

LARAVEL,60

JAVA,50

J2EE,40

C++,30

Enter your choice (1, 2, or 3): 2

Enter the subject name you want to edit: SOFTWARE

Enter the new marks: 78

Enter your choice (1, 2, or 3): 3

Exiting...

9. Create a regular expression that:

a). Identifies and display the string starting with 's' and having 4 characters.

```
import re
```

```
text = "Sample text with some words starting with s and having  
four characters such as sand, silt."
```

```
matches_a = re.findall(r'\bs\w{3}\b', text)
```

```
print("Strings starting with 's' and having four characters:",  
matches_a)
```




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output:=

Strings starting with 's' and having four characters: ['some', 'such', 'sand', 'silt']

b). Splits the string where some special characters are found.

```
import re
```

```
text = "This!is,a@sample;text#with:special/characters"
splitted = re.split(r'[@#;,:/]', text)
print("String split where special characters are found:",
splitted)
```

output:=

String split where special characters are found: ['This', 'is', 'a', 'sample', 'text', 'with', 'special', 'characters']

c). Display the word starting with number.

```
import re
```

```
text = "Sample text with 123 numbers and some words."
matches_c = re.findall(r'\b\d\w*\b', text)
print("Words starting with a number:", matches_c)
```

output:=

Words starting with a number: ['123']



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d). Display the word having 3 or 4 or 5 characters.

```
import re

text = "Sample text with some short and long words."
matches_d = re.findall(r'\b\w{3,5}\b', text)
print("Words having 3, 4, or 5 characters:", matches_d)

output:=
Words having 3, 4, or 5 characters: ['text', 'with', 'some',
'short', 'and', 'long', 'words']
```

e). Display only the dates from the string.

```
import re

text = "Today is 2024-04-18 and tomorrow will be 2024-04-19."
dates = re.findall(r'\b\d{4}-\d{2}-\d{2}\b', text)
print("Dates from the string:", dates)

output:=
Dates from the string: ['2024-04-18', '2024-04-19']
```

f). Create a string with name of the person and his Aadhar number, display only Aadhar number.

```
import re

text = "Name: John Doe, Aadhar: 1234 5678 9012"
```



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```
aadhar_number = re.search(r'\b\d{4}\s\d{4}\s\d{4}\b',
text).group()
print("Aadhar number:", aadhar_number)
```

output:=

Aadhar number: 1234 5678 9012

g). Display all the words that starts with 'at' or 'ap'.

```
import re

text = "Sample text with words like apple, at, bat, and cat."
matches_g = re.findall(r'\b[ap]t\w*\b', text)
print("Words starting with 'at' or 'ap':", matches_g)
```

output:=

Words starting with 'at' or 'ap': ['at']

h). Check if the string starts with 'at' than display appropriate message and otherwise.

```
import re

text = "Sample text starting with at."
if re.match(r'^at', text):
    print("String starts with 'at'.")
else:
    print("String does not start with 'at'.")
```



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output:=

String does not start with 'at'.

10. Do as directed:

a). Name the package used to deal with data frame.

```
import pandas as pd
```

b). Name the package used to deal with data .xlsx file.

```
import pandas as pd
```

c). Name the function used to read the .csv file.

```
import pandas as pd
```

Example usage:

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

d). Name the function used to read the .xlsx file.

```
import pandas as pd
```

Example usage:

```
data = pd.read_excel('data.xlsx')
```

e). Name the function used to read the tuple.

```
import pandas as pd
```

Example usage:

```
tuple_data = [('John', 25), ('Alice', 30), ('Bob', 28)]
```

```
data = pd.DataFrame(tuple_data, columns=['Name', 'Age'])
```



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11. Create a dictionary which stores (at least 10 records) empid, name, city, salary and perform following operations:

- Display first three records
- Display last five records
- Display only Name and City
- Display employee who belongs to Mumbai
- Display employee name who belongs to Mumbai
- Display employee whose salary is more than 25000

```
employee_data = [  
    {'empid': 1, 'name': 'John', 'city': 'Mumbai', 'salary':  
30000},  
    {'empid': 2, 'name': 'Alice', 'city': 'Delhi', 'salary':  
28000},  
    {'empid': 3, 'name': 'Bob', 'city': 'Chennai', 'salary':  
32000},  
    {'empid': 4, 'name': 'Emily', 'city': 'Mumbai', 'salary':  
26000},  
    {'empid': 5, 'name': 'David', 'city': 'Kolkata', 'salary':  
35000},  
    {'empid': 6, 'name': 'Sophia', 'city': 'Mumbai', 'salary':  
27000},  
    {'empid': 7, 'name': 'Emma', 'city': 'Pune', 'salary':  
29000},  
    {'empid': 8, 'name': 'James', 'city': 'Bangalore', 'salary':  
31000},  
    {'empid': 9, 'name': 'Liam', 'city': 'Mumbai', 'salary':  
30000},  
]
```



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```
{'empid': 10, 'name': 'Olivia', 'city': 'Hyderabad',  
'salary': 26000}  
]
```

```
# Display first three records
```

```
print("\na). First three records:")
```

```
for emp in employee_data[:3]:  
    print(emp)
```

```
# Display last five records
```

```
print("\nb). Last five records:")
```

```
for emp in employee_data[-5:]:  
    print(emp)
```

```
# Display only Name and City
```

```
print("\nc). Displaying only Name and City:")
```

```
for emp in employee_data:  
    print(f"Name: {emp['name']}, City: {emp['city']}")
```

```
# Display employee who belongs to Mumbai
```

```
print("\nd). Employees who belong to Mumbai:")
```

```
for emp in employee_data:  
    if emp['city'] == 'Mumbai':  
        print(emp)
```

```
# Display employee name who belongs to Mumbai
```

```
print("\ne). Employee names who belong to Mumbai:")
```

```
for emp in employee_data:  
    if emp['city'] == 'Mumbai':  
        print(emp['name'])
```



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```
# Display employee whose salary is more than 25000
print("\nf). Employees whose salary is more than 25000:")
for emp in employee_data:
    if emp['salary'] > 25000:
        print(emp)
```

output:=

a). First three records:

```
{'empid': 1, 'name': 'John', 'city': 'Mumbai', 'salary': 30000}
{'empid': 2, 'name': 'Alice', 'city': 'Delhi', 'salary': 28000}
{'empid': 3, 'name': 'Bob', 'city': 'Chennai', 'salary': 32000}
```

b). Last five records:

```
{'empid': 6, 'name': 'Sophia', 'city': 'Mumbai', 'salary':
27000}
{'empid': 7, 'name': 'Emma', 'city': 'Pune', 'salary': 29000}
{'empid': 8, 'name': 'James', 'city': 'Bangalore', 'salary':
31000}
{'empid': 9, 'name': 'Liam', 'city': 'Mumbai', 'salary': 30000}
{'empid': 10, 'name': 'Olivia', 'city': 'Hyderabad', 'salary':
26000}
```

c). Displaying only Name and City:

```
Name: John, City: Mumbai
Name: Alice, City: Delhi
Name: Bob, City: Chennai
Name: Emily, City: Mumbai
Name: David, City: Kolkata
Name: Sophia, City: Mumbai
```



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Name: Emma, City: Pune

Name: James, City: Bangalore

Name: Liam, City: Mumbai

Name: Olivia, City: Hyderabad

d). Employees who belong to Mumbai:

```
{'empid': 1, 'name': 'John', 'city': 'Mumbai', 'salary': 30000}
{'empid': 4, 'name': 'Emily', 'city': 'Mumbai', 'salary': 26000}
{'empid': 6, 'name': 'Sophia', 'city': 'Mumbai', 'salary':
27000}
{'empid': 9, 'name': 'Liam', 'city': 'Mumbai', 'salary': 30000}
```

e). Employee names who belong to Mumbai:

John

Emily

Sophia

Liam

f). Employees whose salary is more than 25000:

```
{'empid': 1, 'name': 'John', 'city': 'Mumbai', 'salary': 30000}
{'empid': 2, 'name': 'Alice', 'city': 'Delhi', 'salary': 28000}
{'empid': 3, 'name': 'Bob', 'city': 'Chennai', 'salary': 32000}
{'empid': 4, 'name': 'Emily', 'city': 'Mumbai', 'salary': 26000}
{'empid': 5, 'name': 'David', 'city': 'Kolkata', 'salary':
35000}
{'empid': 6, 'name': 'Sophia', 'city': 'Mumbai', 'salary':
27000}
{'empid': 7, 'name': 'Emma', 'city': 'Pune', 'salary': 29000}
{'empid': 8, 'name': 'James', 'city': 'Bangalore', 'salary':
31000}
```




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```
{'empid': 9, 'name': 'Liam', 'city': 'Mumbai', 'salary': 30000}
{'empid': 10, 'name': 'Olivia', 'city': 'Hyderabad', 'salary':
26000}
```

12. Create an xlsx file store marks of five subjects, plot the data on the bar graph.

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

marks_data = {
    'Student1': [80, 75, 85, 90, 88],
    'Student2': [70, 65, 75, 80, 78],
    'Student3': [85, 80, 88, 92, 90],
    'Student4': [78, 82, 79, 85, 80],
    'Student5': [92, 88, 90, 85, 95]
}

df = pd.DataFrame(marks_data, index=['Maths', 'Physics',
    'Chemistry', 'Biology', 'English'])

df = df.T

df.to_excel('marks_data.xlsx')

df.plot(kind='bar', figsize=(10, 6))
plt.title('Student Marks in Five Subjects')
plt.xlabel('Students')
plt.ylabel('Marks')
plt.xticks(rotation=45)
```



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```
plt.legend(title='Subjects')
plt.grid(axis='y')
```

```
plt.tight_layout()
plt.show()
```

13. Take five income source of the Government and display it on the pie chart.

```
import matplotlib.pyplot as plt

income_sources = ['Taxes', 'Fees and Charges', 'Grants',
                  'Investment Income', 'Other']
income_values = [40, 20, 15, 10, 15]
explode = (0.1, 0, 0, 0, 0)
plt.figure(figsize=(8, 6))
plt.pie(income_values, labels=income_sources, explode=explode,
        autopct='%1.1f%%', startangle=140)

plt.title('Government Income Sources')
plt.axis('equal')
plt.show()
```

14. Draw the line chart representing BSE (Bombay Stock Exchange) index in last 10 years.

```
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
from datetime import datetime, timedelta
```



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```
start_date = datetime.now() - timedelta(days=10*365)
end_date = datetime.now()
date_range = pd.date_range(start=start_date, end=end_date,
                             freq='D')
bse_index = pd.Series(index=date_range,
                       data=np.random.randint(20000, 50000, len(date_range)))

plt.figure(figsize=(10, 6))
plt.plot(bse_index.index, bse_index.values, color='blue',
         marker='o', linestyle='-')

plt.title('BSE Index Over the Last 10 Years')
plt.xlabel('Date')
plt.ylabel('BSE Index')

plt.xticks(rotation=45)

plt.tight_layout()
plt.grid(True)
plt.show()
```

15. Plot the grouped bar graph using the appropriate data.

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

categories = ['Category A', 'Category B', 'Category C']
values1 = [10, 15, 20] # Values for group 1
values2 = [12, 17, 15] # Values for group 2
```



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```
bar_width = 0.35

x = np.arange(len(categories))

plt.bar(x - bar_width/2, values1, bar_width, label='Group 1')
plt.bar(x + bar_width/2, values2, bar_width, label='Group 2')

plt.xlabel('Categories')
plt.ylabel('Values')
plt.title('Grouped Bar Graph')
plt.xticks(x, categories)
plt.legend()

plt.tight_layout()
plt.show()
```