



FEU INSTITUTE OF TECHNOLOGY

COLLEGE OF COMPUTER STUDIES

IT0011

**Integrative Programming and
Technologies**

EXERCISE

3

String and File Handling

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I. PROGRAM OUTCOME (PO) ADDRESSED

Analyze a complex problem and identify and define the computing requirements appropriate to its solution.

II. LEARNING OUTCOME (LO) ADDRESSED

Utilize string manipulation techniques and file handling in Python

III. INTENDED LEARNING OUTCOMES (ILO)

At the end of this exercise, students must be able to:

- Perform common string manipulations, such as concatenation, slicing, and formatting.
- Understand and use file handling techniques to read from and write to files in Python.
- Apply string manipulation and file handling to solve practical programming problems.

IV. BACKGROUND INFORMATION

String Manipulation:

String manipulation is a crucial aspect of programming that involves modifying and processing textual data. In Python, strings are versatile, and several operations can be performed on them. This exercise focuses on fundamental string manipulations, including concatenation (combining strings), slicing (extracting portions of strings), and formatting (constructing dynamic strings).

Common String Methods:

- `len()`: Returns the length of a string.
- `lower()`, `upper()`: Convert a string to lowercase or uppercase.
- `replace()`: Replace a specified substring with another.
- `count()`: Count the occurrences of a substring within a string.

File Handling:

File handling is essential for reading and writing data to external files, providing a way to store and retrieve information. Python offers straightforward mechanisms for file manipulation. This exercise introduces the basics of file handling, covering the opening and closing of files, as well as reading from and writing to text files.

Understanding File Modes:

- `'r'` (read): Opens a file for reading.
- `'w'` (write): Opens a file for writing, overwriting the file if it exists.
- `'a'` (append): Opens a file for writing, appending to the end of the file if it exists.

Understanding string manipulation and file handling is fundamental for processing and managing data in Python programs. String manipulations allow for the transformation and extraction of information from textual data, while file handling enables interaction with external data sources. Both skills are essential for developing practical applications and solving real-world programming challenges. The exercises in this session aim to reinforce these concepts through hands-on practice and problem-solving scenarios.

V. GRADING SYSTEM / RUBRIC

Criteria	Excellent (5)	Good (4)	Satisfactory (3)	Needs Improvement (2)	Unsatisfactory (1)
Correctness	Code functions correctly and meets all requirements.	Code mostly functions as expected and meets most requirements.	Code partially functions but may have logical errors or missing requirements.	Code has significant errors, preventing proper execution.	Code is incomplete or not functioning.
Code Structure	Code is well-organized with clear structure and proper use of functions.	Code is mostly organized with some room for improvement in structure and readability.	Code lacks organization, making it somewhat difficult to follow.	Code structure is chaotic, making it challenging to understand.	Code lacks basic organization.
Documentation	Comprehensive comments and docstrings provide clarity on the code's purpose.	Sufficient comments and docstrings aid understanding but may lack details in some areas.	Limited comments, making it somewhat challenging to understand the code.	Minimal documentation, leaving significant gaps in understanding.	No comments or documentation provided.
Coding Style	Adheres to basic coding style guidelines, with consistent and clean practices.	Mostly follows coding style guidelines, with a few style inconsistencies.	Style deviations are noticeable, impacting code readability.	Significant style issues, making the code difficult to read.	No attention to coding style; the code is messy and unreadable.
Effort and Creativity	Demonstrates a high level of effort and creativity, going beyond basic requirements.	Shows effort and creativity in addressing most requirements.	Adequate effort but lacks creativity or exploration beyond the basics.	Minimal effort and creativity evident.	Little to no effort or creativity apparent.

VI. LABORATORY ACTIVITY

INSTRUCTIONS:

Copy your source codes to be pasted in this document as well as a screen shot of your running output.

3.1. Activity for Performing String Manipulations

Objective: To perform common and practical string manipulations in Python.

Task: Write a Python program that includes the following string manipulations:

- Concatenate your first name and last name into a full name.
- Slice the full name to extract the first three characters of the first name.
- Use string formatting to create a greeting message that includes the sliced first name

Sample Output

```
Enter your first name: Peter
Enter your last name: Parker
Enter your age: 20

Full Name: Peter Parker
Sliced Name: Pete
Greeting Message: Hello, Pete! Welcome. You are 20 years old.
```

3.2 Activity for Performing String Manipulations

Objective: To perform common and practical string manipulations in Python.

Task: Write a Python program that includes the following string manipulations:

- Input the user's first name and last name.
- Concatenate the input names into a full name.
- Display the full name in both upper and lower case.
- Count and display the length of the full name

Sample Output

```
Enter your first name: Cloud
Enter your last name: Strife
Full Name: Cloud Strife
Full Name (Upper Case): CLOUD STRIFE
Full Name (Lower Case): cloud strife
Length of Full Name: 12
```

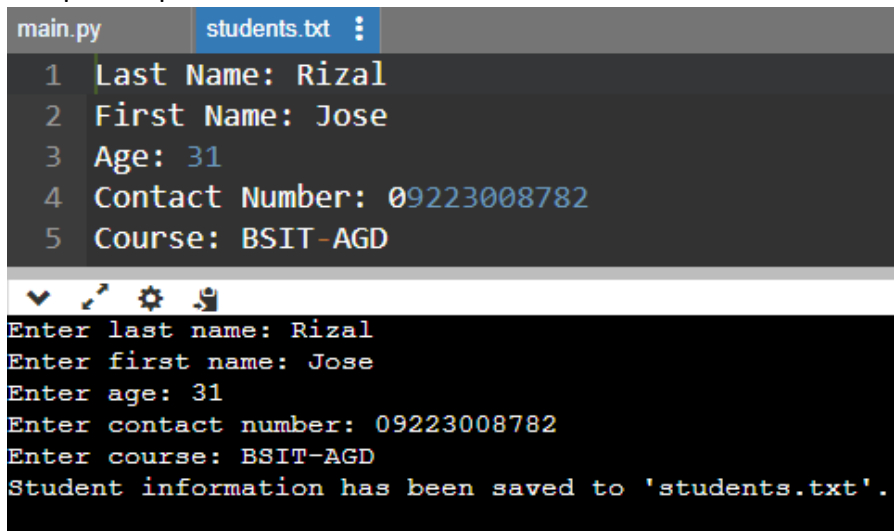
3.3. Practical Problem Solving with String Manipulation and File Handling

Objective: Apply string manipulation and file handling techniques to store student information in a file.

Task: Write a Python program that does the following:

- Accepts input for the last name, first name, age, contact number, and course from the user.
- Creates a string containing the collected information in a formatted way.
- Opens a file named "students.txt" in append mode and writes the formatted information to the file.
- Displays a confirmation message indicating that the information has been saved.

Sample Output



The screenshot shows a Python IDE with two tabs: 'main.py' and 'students.txt'. The 'main.py' tab is active, displaying a script with five lines of code that prompt the user for their last name, first name, age, contact number, and course. The 'students.txt' tab is also visible, showing the formatted student information that has been saved to the file. Below the code editor, the terminal window shows the program's execution, with prompts and user input for each field, followed by a confirmation message: 'Student information has been saved to 'students.txt'.'

```
1 Last Name: Rizal
2 First Name: Jose
3 Age: 31
4 Contact Number: 09223008782
5 Course: BSIT-AGD

Enter last name: Rizal
Enter first name: Jose
Enter age: 31
Enter contact number: 09223008782
Enter course: BSIT-AGD
Student information has been saved to 'students.txt'.
```

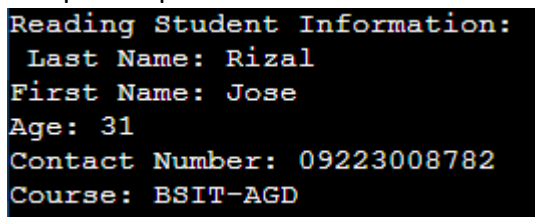
3.4 Activity for Reading File Contents and Display

Objective: Apply file handling techniques to read and display student information from a file.

Task: Write a Python program that does the following:

- Opens the "students.txt" file in read mode.
- Reads the contents of the file.
- Displays the student information to the user

Sample Output



The screenshot shows a terminal window with the output of a program that reads student information from a file. The output is formatted to match the sample input from the previous section, displaying the last name, first name, age, contact number, and course.

```
Reading Student Information:
Last Name: Rizal
First Name: Jose
Age: 31
Contact Number: 09223008782
Course: BSIT-AGD
```

QUESTION AND ANSWER:

1. How does the format() function help in combining variables with text in Python? Can you provide a simple example?

The format() function in Python provides a flexible way to insert variables into strings, making it easier to create formatted output. It allows you to specify placeholders within a string, which are then replaced by the values provided.

2. Explain the basic difference between opening a file in 'read' mode ('r') and 'write' mode ('w') in Python. When would you use each

Opening a file in 'read' mode ('r') allows you to only access and view the content of the file without making any changes, whereas opening a file in 'write' mode ('w') creates a new file or truncates an existing file for writing new data. You would use 'r' mode when you need to process or display data from an existing file, and 'w' mode when you want to overwrite old content or create a fresh file with new information.

3. Describe what string slicing is in Python. Provide a basic example of extracting a substring from a larger string.

String slicing in Python is a technique used to extract a subset of characters from a larger string by specifying a start and an end index. This method allows you to quickly retrieve a portion of the string without using loops.

4. When saving information to a file in Python, what is the purpose of using the 'a' mode instead of the 'w' mode? Provide a straightforward example.

Using the 'a' mode when saving information to a file appends new content to the end of the file without erasing the existing data, whereas the 'w' mode overwrites the entire file content. This is particularly useful when you want to maintain a log or record of information over time.

5. Write a simple Python code snippet to open and read a file named "data.txt." How would you handle the case where the file might not exist?

try:

with open("data.txt", "r") as file:

contents = file.read()

print(contents)

except FileNotFoundError:

print("The file 'data.txt' does not exist.")

This code attempts to open the file in read mode and print its contents

3.1 Source Code

```
first_name = input("Enter your first name: ")
last_name = input("Enter your last name: ")
age = input("Enter your age: ")

full_name = first_name + " " + last_name
sliced_fname = first_name[:3]
greeting_message = f"Hello!, {first_name}! Welcome. You are {age} years old."

print("Full Name:", full_name)
print("Sliced First Name:", sliced_fname)
print("Greeting Message:", greeting_message)
```

3.1 Screenshot

```
Enter your first name: Bruce
Enter your last name: Wayne
Enter your age: 28
Full Name: Bruce Wayne
Sliced First Name: Bru
Greeting Message: Hello!, Bruce! Welcome. You are 28 years old.
```

3.2 Source Code

```
first_name = input("Enter your first name: ")
last_name = input("Enter your last name: ")

full_name = first_name + " " + last_name

full_name_upper = full_name.upper()
full_name_lower = full_name.lower()

full_name_length = len(full_name)

print("Full Name:", full_name)
print("Full Name in Upper Case:", full_name_upper)
print("Full Name in Lower Case:", full_name_lower)
print("Length of Full Name:", full_name_length)
```

3.2 Screenshot

```
Enter your first name: Bruce
Enter your last name: Wayne
Full Name: Bruce Wayne
Full Name in Upper Case: BRUCE WAYNE
Full Name in Lower Case: bruce wayne
Length of Full Name: 11
```

3.3 Source Code

```
import os

script_dir = os.path.dirname(os.path.abspath(__file__))
file_path = os.path.join(script_dir, "students.txt")

last_name = input("Enter your last name: ")
first_name = input("Enter your first name: ")
age = input("Enter your age: ")
contact_number = input("Enter your contact number: ")
course = input("Enter your course: ")

student_info = (
    f"Last Name: {last_name}\n"
    f"First Name: {first_name}\n"
    f"Age: {age}\n"
    f"Contact Number: {contact_number}\n"
    f"Course: {course}\n\n\n"
)

with open(file_path, "a") as file:
    file.write(student_info)

print("Student information has been saved successfully.")
```

3.3 Screenshot

```
Enter your last name: Wayne
Enter your first name: Bruce
Enter your age: 30
Enter your contact number: 0123456789
Enter your course: BSIT-CST
Student information has been saved successfully.
```



```
1 Last Name: Wayne
2 First Name: Bruce
3 Age: 30
4 Contact Number: 0123456789
5 Course: BSIT-CST
```

3.4 Source Code

```
import os

script_dir = os.path.dirname(os.path.abspath(__file__))
file_path = os.path.join(script_dir, "students.txt")

with open(file_path, "r") as file:
    contents = file.read()
    print(contents)
```

3.4 Screenshot

```
Last Name: Wayne
First Name: Bruce
Age: 30
Contact Number: 0123456789
Course: BSIT-CST
```