

| Hands-on Activity 5.2 Polymorphism | |
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| Course/Section- BSCPE12S1 | Engr. Roman M. Richard |

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C:\Users\lauper xavier\Desktop\ \python\oopfa1_group13_lab8\FileReaderWriter.py
FileReaderWriter.py X CSVFileReaderWriter.py X JSONFileReaderWriter.py X sample.csv X sample.json X main.py X
1 class FileReaderWriter():
2     def read(self):
3         print("This is the default read method")
4
5     def write(self):
6         print("This is the default write method")

C:\Users\lauper xavier\Desktop\ \python\oopfa1_group13_lab8\CSVFileReaderWriter.py
FileReaderWriter.py X CSVFileReaderWriter.py X JSONFileReaderWriter.py X sample.csv X sample.json X main.py X
1 from FileReaderWriter import FileReaderWriter
2 import csv
3
4 class CSVFileReaderWriter(FileReaderWriter):
5     def read(self, filepath):
6         with open(filepath, newline='') as csvfile:
7             data = csv.reader(csvfile, delimiter=',', quotechar='/')
8             for row in data:
9                 print(row)
10            return data
11
12    def write(self, filepath, data):
13        with open(filepath, 'w', newline='') as csvfile:
14            writer = csv.writer(csvfile, delimiter=',',
15                               quotechar='/', quoting=csv.QUOTE_MINIMAL)
16            writer.writerow(data)
17

```

```
C:\Users\lauper xavier\Desktop\ \python\oopfa1_group13_lab8\JSONFileReaderWriter.py

FileReaderWriter.py X CSVFileReaderWriter.py X JSONFileReaderWriter.py X sample.csv X sample.json X main.py X

1 from FileReaderWriter import FileReaderWriter
2 import json
3
4 class JSONFileReaderWriter(FileReaderWriter):
5     def read(self, filepath):
6         with open(filepath, "r") as read_file:
7             data = json.load(read_file)
8             print(data)
9             return data
10
11     def write(self, filepath, data):
12         with open(filepath, "w") as write_file:
13             json.dump(obj=data, fp=write_file)
```

```
C:\Users\lauper xavier\Desktop\ \python\oopfa1_group13_lab8\sample.csv

FileReaderWriter.py X CSVFileReaderWriter.py X JSONFileReaderWriter.py X sample.csv X sample.json X main.py X

1 Apple,Banana,Mango,Orange,Cherry
```

```
C:\Users\lauper xavier\Desktop\ \python\oopfa1_group13_lab8\sample.json

FileReaderWriter.py X CSVFileReaderWriter.py X JSONFileReaderWriter.py X sample.csv X sample.json X main.py X

1 {
2     "description":"This is a JSON Sample",
3     "accounts": [
4         {"id":1,"name":"Jack"},
5         {"id":2,"name":"Rose"}
6     ]
7 }
```

```
C:\Users\lauper xavier\Desktop\ \python\oopfa1_group13_lab8\main.py
FileReaderWriter.py × CSVFileReaderWriter.py × JSONFileReaderWriter.py × sample.csv × sample.json × main.py ×
1 from FileReaderWriter import FileReaderWriter
2 from CSVFileReaderWriter import CSVFileReaderWriter
3 from JSONFileReaderWriter import JSONFileReaderWriter
4
5
6 df = FileReaderWriter()
7 df.read()
8 df.write()
9
10
11 c = CSVFileReaderWriter()
12 c.read("sample.csv")
13 c.write(filepath="sample2.csv", data=["Hello", "World"])
14
15 j = JSONFileReaderWriter()
16 j.read("sample.json")
17 j.write(data=['foo', {'bar': ('baz', None, 1.0, 2)}], filepath="sample2.json")
```

```
In [2]: runfile('C:/Users/Lauper xavier/Desktop/ \python\oopfa1_group13_lab8/main.py', wdir='C:/
Users/Lauper xavier/Desktop/ \python\oopfa1_group13_lab8')
Reloaded modules: FileReaderWriter, CSVFileReaderWriter, JSONFileReaderWriter
This is the default read method
This is the default write method
['Apple', 'Banana', 'Mango', 'Orange', 'Cherry']
{'description': 'This is a JSON Sample', 'accounts': [{'id': 1, 'name': 'Jack'}, {'id': 2, 'name':
'Rose'}]}

In [3]:
```

6. Supplementary Activity:

Task

Create a simple TextFileReaderWriter .py file and Class that will be able to **read** from and **write** (override) to a text file. The read and write method should be overridden according to the requirement of Text File Reading and Writing as performed in Laboratory Activity 5.

The screenshot shows the Spyder Python IDE with the following components:

- Editor:** Displays the `TextFileReaderWriter.py` file. The code defines a class `TextFileReaderWriter` with methods `readFile` and `writeFile`. The `readFile` method checks the file extension (".csv" or ".json") and uses the corresponding reader/writer class. The `writeFile` method does the same for writing. The test section creates an instance of the class and performs read and write operations on `sample.csv` and `sample.json`.
- File Explorer:** Shows the project structure with files `FileReaderWriter.py`, `JSONFileReaderWriter.py`, `CSVFileReaderWriter.py`, `main.py`, and `TextFileReaderWriter.py`.
- Console:** Shows the execution of `runfile('C:/Users/LENOVO/Downloads/TextFileReaderWriter.py', wdir='C:/Users/LENOVO/Downloads')`. It lists the loaded modules: `FileReaderWriter`, `JSONFileReaderWriter`, and `CSVFileReaderWriter`. It also shows the output of the `readFile` method for `sample.json`, which is a list of dictionaries: `[{'description': 'This is JSON Sample', 'accounts': [{'id': 1, 'name': 'Jack'}, {'id': 2, 'name': 'Rose'}]}]`.
- Output Window:** Shows the output of the `readFile` method for `sample.csv`, which is `["This is CSV Sample"]`.

Questions 1. Why is Polymorphism important?

It allows us to have one interface to perform similar tasks in many different ways. Polymorphism makes the code easy to change, maintain, and extend by increasing flexibility.

2. Explain the advantages and disadvantages of using applying Polymorphism in an Object-Oriented Program.

Less disruption of client code, modulo specific “factory” operations to set up the kinds of objects that code needs to interact with for a given application.

3. What maybe the advantage and disadvantage of the program we wrote to read and write csv and json files?

advantage- Readable and easy to edit manually disadvantage - CSV allows to move most basic data only. Complex configurations cannot be imported and exported this way.

4. What maybe considered if Polymorphism is to be implemented in an Object-Oriented Program?

Polymorphism is another fundamental concept in OOP, which means multiple forms. Polymorphism allows the use of a single interface with different underlying forms, such as data types or classes.

5. How do you think Polymorphism is used in an actual programs that we use today?

Like a man at the same time is a father, a husband, an employee. So the same person possesses different behavior in different situations. This is called polymorphism. Polymorphism is considered one of the important features of Object-Oriented Programming.

Conclusion

During this activity it allows us to know the importance of polymorphism in programming since programmers will most like deal with polymorphism during different types of problems since polymorphism makes the code easy to change, maintain and extend because you can use the same name of the method of the child class to its parent class but inheritance is different since polymorphism does not inherit the methods that has the same name.

“I accept responsibility for my role in ensuring the integrity of the work submitted by the group in which I participated.”