The Open University of Sri Lanka

Faculty of Engineering Technology

Department of Electrical and Computer Engineering

012

Study Programme	: Bachelor of Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	**: EEX3372 – Programming in Python**
Academic Year	: 2022/2023
Date	: 13th February 2024
Time	: 9.30-12.30
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper contains four (4) questions in two (2) pages.
3. **Answer all questions.**
4. This is a Closed Book Test **(CBT).**
5. Answers should be in clear handwriting.
6. Do not use a red color pen.

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01. Analyzing Python Code for Data Handling

i. Given the code snippet **data = [1, 2, 3, 4, 5]** and **squared_data = [x**2 for x in data]** explain the concept demonstrated and its significance in Python. **(7 marks)**

ii. How would you modify the code to filter out only even numbers from data and square them? **(6 marks)**

iii. Discuss the efficiency of list comprehensions compared to traditional looping structures in Python. **(6 marks)**

iv. Propose an alternative method to achieve the same result without using list comprehensions. **(6 marks)**

[Total 25 marks]

02. Function Definition and Call Mechanics

i. Consider the code **def add(a, b): return a + b**. Explain how this function works and how you would call it to add two numbers. **(7 marks)**

ii. What changes would you make to the function to enable it to handle an arbitrary number of arguments? **(6 marks)**

iii. Discuss the difference between positional and keyword arguments in the context of this function. **(6 marks)**

iv. How would you modify the function to add error handling, ensuring it only accepts numeric inputs? **(6 marks)**

[Total 25 marks]

03. File Handling and Parsing

i. Given a code snippet that opens a file **file = open('data.txt', 'r')** and reads lines, explain how file handling works in Python. **(7 marks)**

ii. How would you modify this code to safely close the file after reading, using a Pythonic approach? **(6 marks)**

iii. Discuss the implications of not properly closing files in a Python program. **(6 marks)**

iv. Propose an enhancement to the code to read and print each line's content along with its line number. **(6 marks)**

[Total 25 marks]

04. Object-Oriented Programming in Practice

i. With the class definition **class Animal: def __init__(self, name): self.name = name**, explain how object instantiation works. **(7 marks)**

ii. How would you extend this class to include a method **make_sound** that prints a sound specific to an animal type? **(6 marks)**

iii. Discuss the concept of inheritance in Python using **Animal** as a base class for a **Dog** class with an overridden **make_sound** method. **(6 marks)**

iv. Provide an example of polymorphism using the **Animal** and **Dog** classes where the type of animal is not known until runtime. **(6 marks)**

[Total 25 marks]

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