Department of Electrical and Electronics Engineering

Academic Year 2024 – 2025 (Odd Semester)

Degree, Semester & Branch: I Semester B.E. EEE

Course Code & Title: GE3151- Problem Solving and Python Programming

Name of the Faculty member (s): Dr.P.Prem

Innovative Practice Description

- **Unit / Topic:** Unit I- Algorithmic Problem Solving
- **Course Outcome:** CO 1
- **Unit Outcome:**CO1-TLO2
- **Activity Chosen:** Think pair share
- **Justification:**
  - ✓ It helps students to think individually about a topic or answer to a question.
  - ✓ It teaches students to share ideas with classmates and builds oral communication skills.
  - ✓ It helps focus attention and engage students in comprehending the reading material.
- **Time Allotted for the Activity:** 10 minutes
- **Details of the Implementation:**
  Think-Pair-Share, an innovative practice, was conducted after explaining the concept of computational thinking and problem-solving. Initially, I asked the students to think about the need for computational thinking for 2 minutes. Then, I paired them up to discuss with their peers. They discussed the steps in algorithmic problem-solving for 3 minutes. Finally, one of the teams explained the concept to the whole class for further discussion. The students from the group shared their points and participated in the discussion for 10 minutes.
- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	-	-	1	-	-	-	1	-	-	-	-	-	-

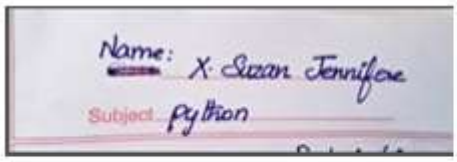
(1 – Low 2 – Moderate 3 – High)

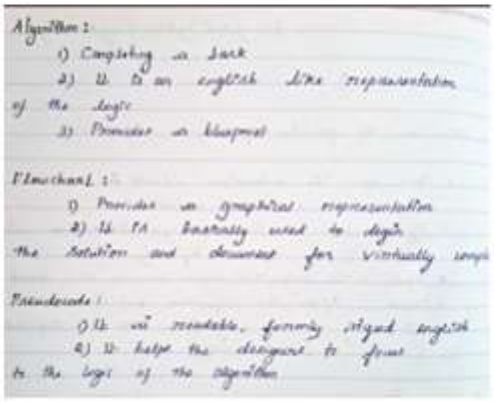
- **PO / PSO mapped:**

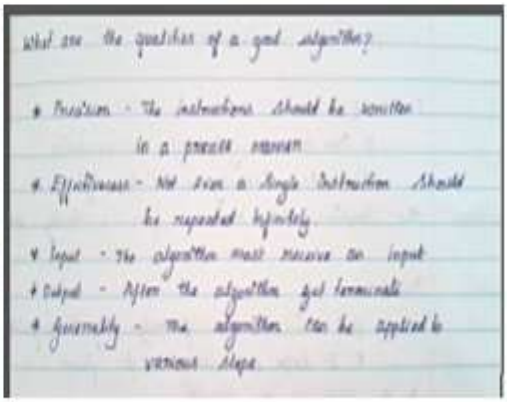
Innovative practice	PO9
	1
Justification for correlation	The students can Function effectively as a team

- **Images / Screenshot of the practice:**

Innovative Teaching Method Execution
Algorithmic Problem Solving – Think Pair Share







- **Reflective Critique:**
  - ***Feedback of practice from students and other stakeholders:***
    - ✓ Students grasped the concept well.
  - ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

    Think-pair-sharing forces all students to attempt an initial response to the question, which they can then clarify and expand as they collaborate.
  - ***Challenges faced in implementation:***

    It consumes a bit more time than planned.

References:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.

Signature of Faculty Member **HOD**

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Name of the Faculty member (s): Dr.P.Prem

Innovative Practice Description

Unit / Topic: Unit II / Demonstration of Data types in python

- **Course Outcome:** CO 2
- **Unit Outcome:** TLO7
- **Activity Chosen:** Python IDLE execution
- **Justification:**

  Teaching data types using the "hands-on" approach with the type command allows students to actively engage with the material, reinforcing their understanding through practice. This technique encourages problem-solving skills and helps students gain confidence in working with Python's core concepts.
- **Time Allotted for the Activity:** 45 minutes
- **Details of the Implementation:**

  The different data types in Python were taught live using the PC in the classroom. The students manually created their own variables and identified the data type using the type command.
- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3			3			1		1		3	3	3	

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO 1**
	3
Justification for correlation	The students will have strong fundamental knowledge.

- **Images / Screenshot of the practice:**

Reflective Critique:

- ***Feedback of practice from students and other stakeholders:***
  The concept reached the students well.
- ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)
  Students learned by practice and it will improve their confidence.
- ***Challenges faced in implementation:***

1. Monitoring the students while using mobile phones in the class was challenging.

References:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

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Innovative Practice Description

- **Unit / Topic: Unit III** / Continue, Pass and Break Statements
- **Course Outcome:** CO3
- **Unit Outcome:** TLO12
- **Activity Chosen:** One Minute Paper
- **Justification:**
  Using the One-Minute Paper helps reinforce students' understanding by encouraging them to reflect and apply the concepts of continue, pass, and break through practical examples. It also provides immediate feedback, ensuring any misconceptions are addressed quickly.
- **Time Allotted for the Activity:** 5 minutes
- **Details of the Implementation:**
  At the end of the class, students were asked to write three examples on their own, using the continue, pass, and break statements. The students wrote their own programs incorporating these statements. This activity gave them a better understanding of the differences between the three statements and how to apply them effectively.
- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO3	3	3	-	-	3	-	-	-	-	1	-	-	3	-	-

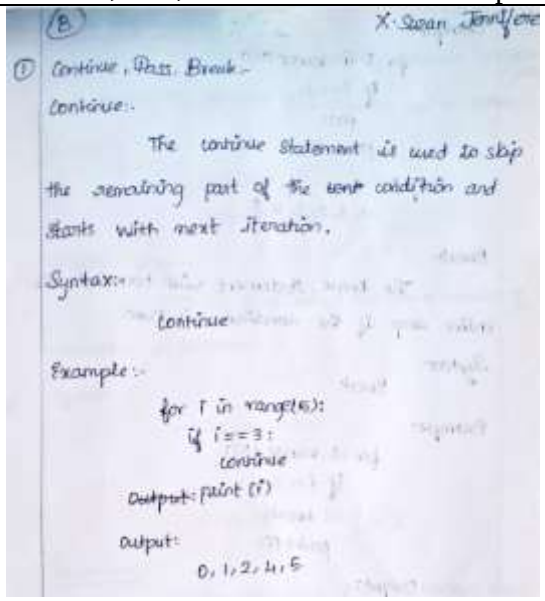
(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	PO 10
	1
Justification for correlation	The students can effectively communicate on engineering activities and make presentations on the given topics

- **Images / Screenshot of the practice:**

Innovative Teaching Method Execution
Continue, Pass, Break – One Minute Paper



Reflective Critique:

- ***Feedback of practice from students and other stakeholders:***
- Students understood the concept well. Particularly the difference between the three statements.

- ***Benefit of the practice:***
- Students can apply the concepts in their own way to create tailor made codes.

- ***Challenges faced in implementation:***
  Making all the learners to participate, as this activity requires involvement from all.

References:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

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Innovative Practice Description

Unit / Topic: Unit IV / Difference between List, Tuples and Dictionaries

- **Course Outcome:** CO 4
- **Unit Outcome:** TLO 19 and TLO 20
- **Activity Chosen:** Python IDLE execution
- **Justification:**

  Teaching the differences between lists, tuples, and dictionaries by demonstration helps students understand key concepts such as mutability, indexing, and key-value pairs through practical examples. By directly interacting with the data structures, students can visualize and experience their behaviors, making the learning process more engaging and effective.

- **Time Allotted for the Activity:** 45 minutes

- **Details of the Implementation:**

  Data structures in Python are used to store and organize multiple items. While they have different properties (e.g., mutability, order), they all serve the purpose of grouping related data. The students developed code to understand the differences between these three data structures.

- **CO – PO / PSO mapping:**

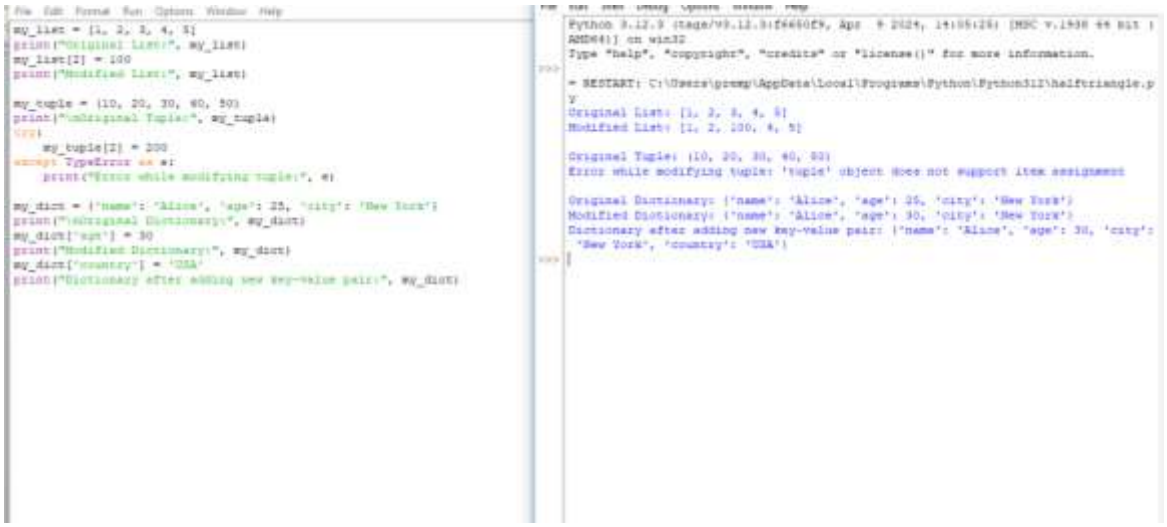
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO4	3	3	-	-	3	-	-	-	-	-	-	-	3	3	-

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO 1**
	4
Justification for correlation	The students will have strong fundamental knowledge.

- **Images / Screenshot of the practice:**



```
my_list = [1, 2, 3, 4, 5]
print("Original List:", my_list)
my_list[2] = 100
print("Modified List:", my_list)

my_tuple = (10, 20, 30, 40, 50)
print("\nOriginal Tuple:", my_tuple)
try:
    my_tuple[2] = 200
except TypeError as e:
    print("Error while modifying tuple:", e)

my_dict = {'name': 'Alice', 'age': 25, 'city': 'New York'}
print("\nOriginal Dictionary:", my_dict)
my_dict['age'] = 30
print("Modified Dictionary:", my_dict)
my_dict['country'] = 'USA'
print("Dictionary after adding new key-value pair:", my_dict)
```

```
Python 3.12.3 (tags/v3.12.3:f6650f9, Apr  9 2024, 14:05:25) [MSC v.1938 64 bit (
AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
= RESTART: C:\Users\premp\AppData\Local\Programs\Python\Python312\halftriangle.p
y
Original List: [1, 2, 3, 4, 5]
Modified List: [1, 2, 100, 4, 5]

Original Tuple: (10, 20, 30, 40, 50)
Error while modifying tuple: 'tuple' object does not support item assignment

Original Dictionary: {'name': 'Alice', 'age': 25, 'city': 'New York'}
Modified Dictionary: {'name': 'Alice', 'age': 30, 'city': 'New York'}
Dictionary after adding new key-value pair: {'name': 'Alice', 'age': 30, 'city':
 'New York', 'country': 'USA'}
>>>
```

Reflective Critique:

- ❖ ***Feedback of practice from students and other stakeholders:***
  The concept reached the students well.
- ❖ ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)
  Students learned by practice and it will improve their confidence.
- ❖ ***Challenges faced in implementation:***

1. Monitoring the students while using mobile phones in the class was challenging.

References:

1. Allen B. Downey, “Think Python: How to Think like a Computer Scientist”, 2nd Edition, O’Reilly Publishers, 2016.
2. Karl Beecher, “Computational Thinking: A Beginner's Guide to Problem Solving and Programming”, 1st Edition, BCS Learning & Development Limited, 2017.

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Innovative Practice Description

- **Unit / Topic: Unit V /** Python Modules
- **Course Outcome:** CO5
- **Topic Learning Outcome:** TLO24
- **Activity Chosen:** Flipped Classroom
- **Justification:**

  This topic is chosen, since it can be easily understood by students. Students can improve their understanding on this topic by this activity. More time for discussion is given the class unlike traditional learning. This activity greatly helps the student to know the concept much deeper.
- **Time Allotted for the Activity:** 25 Minutes
- **Details of the Implementation:**
  - Each team was asked to conduct a literature survey on the assigned topic. They were required to include at least 5 references related to the topic, using the materials already shared. Students within each team were tasked with creating a PowerPoint presentation to present their topic. After the presentation, students could ask questions to the presenting team.
  - **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO8	PO10	PO12	PSO1
CO5	3	3	3	1	1	2	3

- **Images / Screenshot of the practice:**

- **Reflective Critique:**
  - ***Feedback of practice from students and other stakeholders:***
    The students found the activity engaging. They came up with new ideas to explain the concept of python modules.

  - ***Benefit of the practice:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)
    The students related the concepts learned to real world applications like calculator and gaming
  - ***Challenges faced in implementation:***
    Few students were found non participative. So, they were permitted to communicate in native language top improve their confidence

References:

1. Allen B. Downey, “Think Python: How to Think like a Computer Scientist”, 2nd Edition, O’Reilly Publishers, 2016.
2. Karl Beecher, “Computational Thinking: A Beginner's Guide to Problem Solving and Programming”, 1st Edition, BCS Learning & Development Limited, 2017.

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