School of Computer Science and Artificial Intelligence

Lab Assignment # 7.2

Program : B. Tech (CSE)

Specialization : AIML

Course Title : AI Assisted Coding

Course Code: 23CS002PC304

Semester : VI

Academic Session : 2025-2026

Name of Student : B.Naveen Kumar

Enrollment No. : 2303A52093

Batch No. : 33

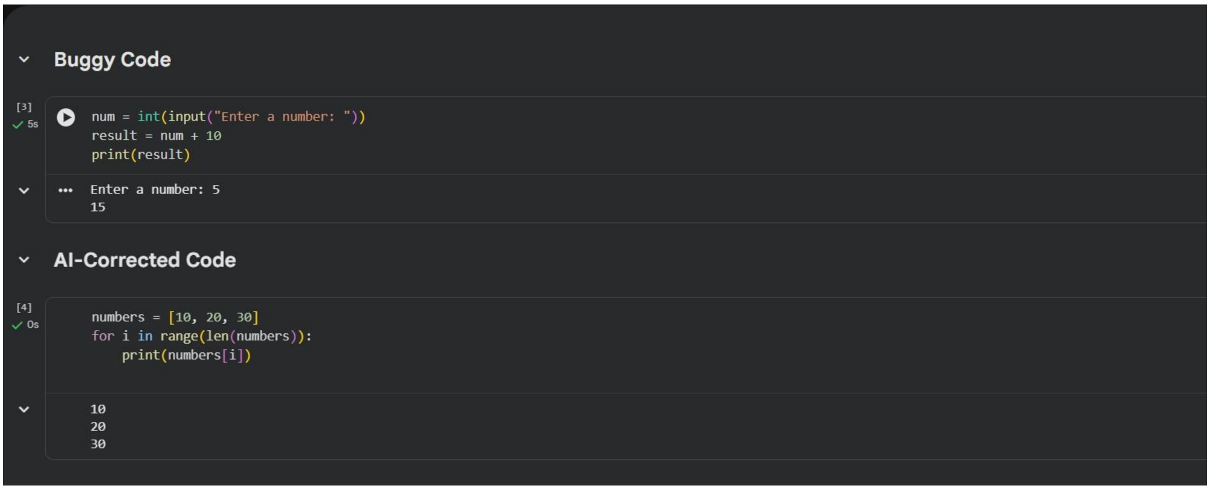
Date : 03/02/26

Lab 7: Error Debugging with AI (Week 4 – Tuesday)

Topic: Systematic approaches to finding and fixing bugs using AI

Task 1 – Runtime Error Due to Invalid Input Type Bug Analysis (AI Explanation)

- input() always returns a **string**
- Adding a string and an integer causes a **TypeError**



Buggy Code

```
num = int(input("Enter a number: "))
result = num + 10
print(result)
```

```
Enter a number: 5
15
```

AI-Corrected Code

```
numbers = [10, 20, 30]
for i in range(len(numbers)):
    print(numbers[i])
```

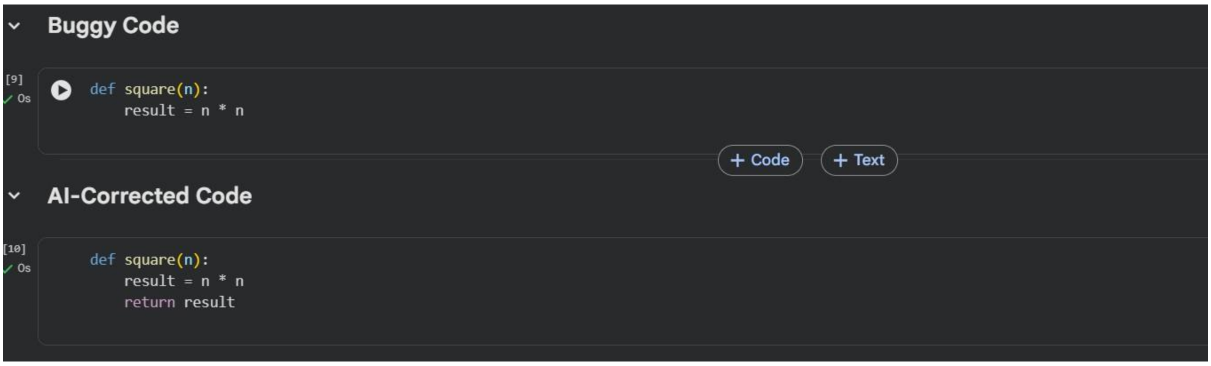
```
10
20
30
```

Expected Output – 1

- AI converts user input to an integer
- Runtime error is eliminated

Task 2 – Incorrect Function Return Value Bug Analysis (AI Explanation)

- Function calculates the square but **does not return it**
- Without return, Python returns None



Buggy Code

```
def square(n):
    result = n * n
```

AI-Corrected Code

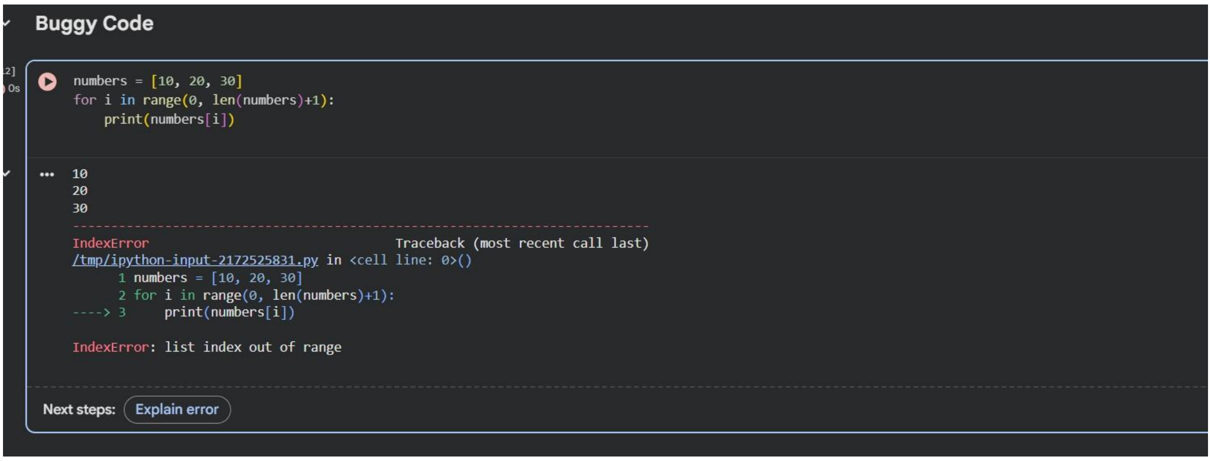
```
def square(n):
    result = n * n
    return result
```

Expected Output – 2

- Function correctly returns the square of the number

Task 3 – IndexError in List Traversal Bug Analysis (AI Explanation)

- range(0, len(numbers)+1) goes **one step too far**
- Causes IndexError: list index out of range

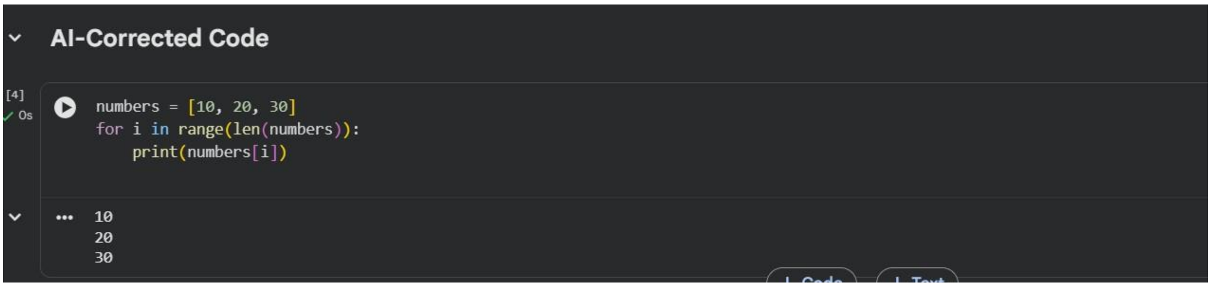


Buggy Code

```
numbers = [10, 20, 30]
for i in range(0, len(numbers)+1):
    print(numbers[i])
```

```
10
20
30
---------------------------------------------------------------------------
IndexError                                Traceback (most recent call last)
/tmp/ipython-input-2172525831.py in <cell line: 0>()
      1 numbers = [10, 20, 30]
      2 for i in range(0, len(numbers)+1):
----> 3     print(numbers[i])

IndexError: list index out of range
```



AI-Corrected Code

```
numbers = [10, 20, 30]
for i in range(len(numbers)):
    print(numbers[i])
```

```
10
20
30
```

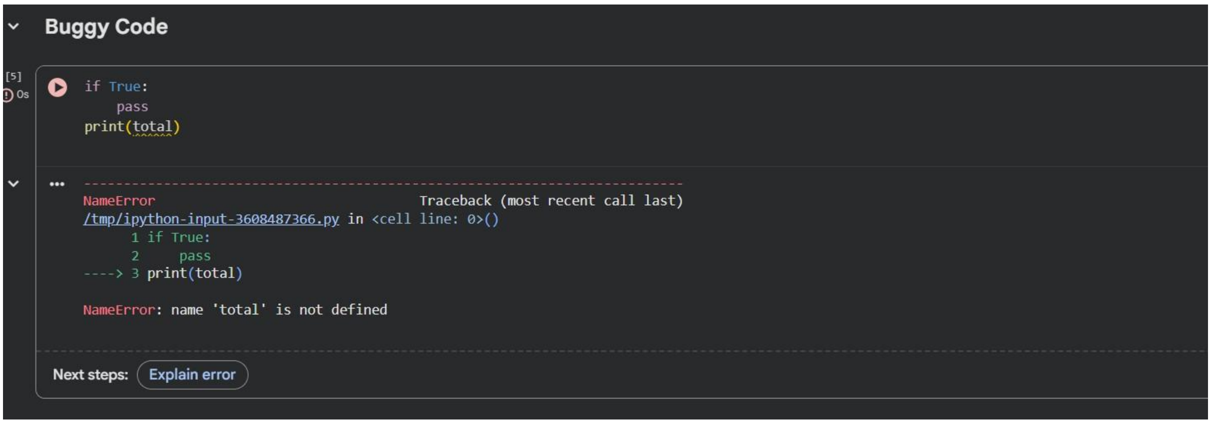
Expected Output – 3

- Loop boundary corrected
- Prevents out-of-range access

Task 4 – Uninitialized Variable Usage

Bug Analysis (AI Explanation)

- Variable total is **used before assignment**
- Causes NameError

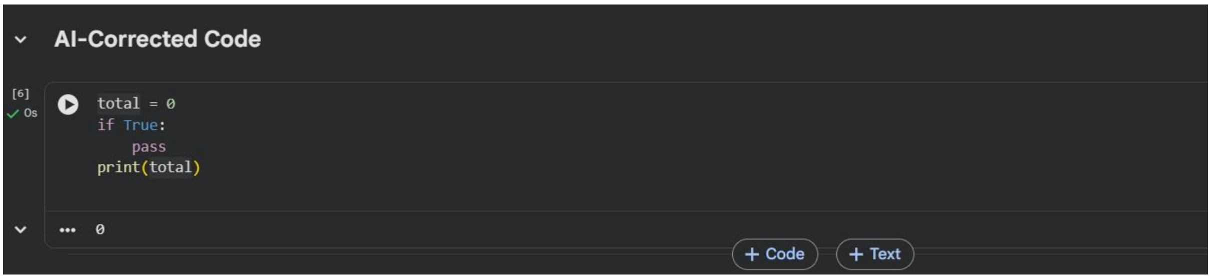


Buggy Code

```
if True:
    pass
print(total)
```

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
/tmp/ipython-input-3608487366.py in <cell line: 0>()
      1 if True:
      2     pass
----> 3 print(total)

NameError: name 'total' is not defined
```



```
total = 0
if True:
    pass
print(total)
```

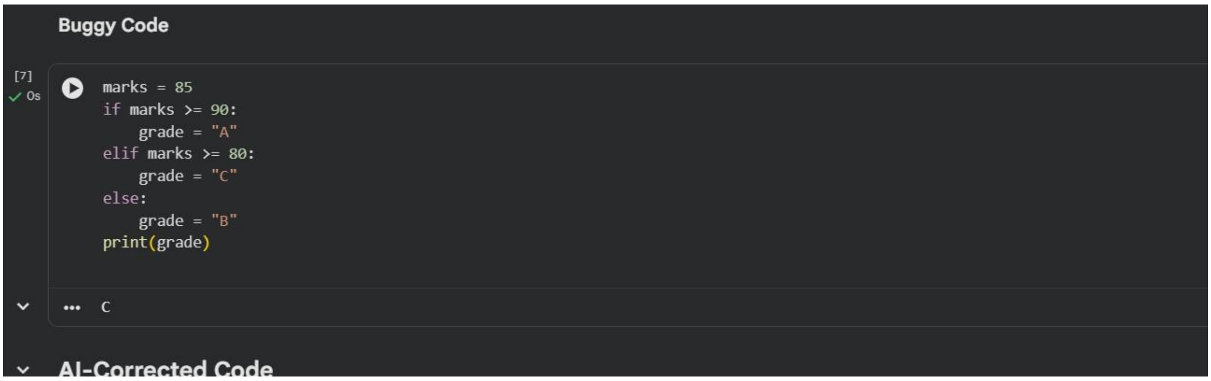
```
0
```

Expected Output – 4

- Variable initialized before use
- Program runs safely

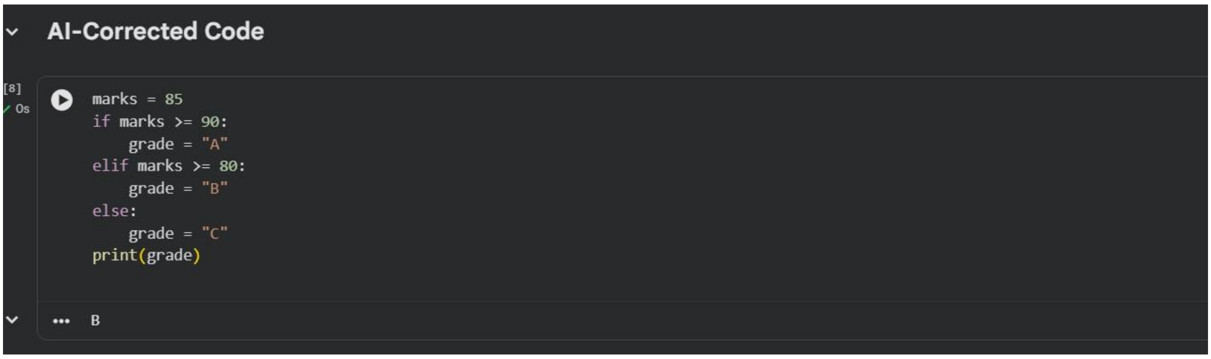
Task 5 – Logical Error in Student Grading System Bug Analysis (AI Explanation)

- Logical order of grading conditions is incorrect
- marks >= 80 wrongly assigns grade **C**
- else block assigns **B** incorrectly



```
marks = 85
if marks >= 90:
    grade = "A"
elif marks >= 80:
    grade = "C"
else:
    grade = "B"
print(grade)
```

```
C
```



```
marks = 85
if marks >= 90:
    grade = "A"
elif marks >= 80:
    grade = "B"
else:
    grade = "C"
print(grade)
```

```
B
```

Expected Output – 5

- Correct grade is assigned based on marks
- Logical flow fixed

Summary: AI-Assisted Debugging Strategies Used

✓ Type conversion for runtime errors

✓ Return statement validation

✓ Loop boundary correction

✓ Variable initialization checks

✓ Logical condition reordering