

School of Computer Science and Artificial Intelligence

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Lab Assignment # 3.2

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Program	: B. Tech (CSE)
Specialization	:
Course Title	: AI Assisted coding
Course Code	:
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Task – 1

Prompt : Create a calculator function that performs addition, subtraction, multiplication, and division.

Include error handling for division by zero.

## Explanation

```
[3] 0s def calculator(a, b, operator):  
    """  
    Performs basic arithmetic operations.  
    Example: calculator(10, 5, '+') returns 15  
    """  
    if operator == '+':  
        return a + b  
    elif operator == '-':  
        return a - b  
    elif operator == '*':  
        return a * b  
    elif operator == '/':  
        if b == 0:  
            return "Error: Division by zero"  
        return a / b  
    else:  
        return "Invalid operator"  
  
    # Example usage  
    print(calculator(10, 5, '*'))
```

In this task, the goal was to understand how progressively improving a prompt affects the quality of AI-generated code.

- When a minimal prompt was used, the AI generated a very basic calculator function with limited operations and no error handling.
- Adding comments and context helped the AI understand the expected functionality, resulting in support for more arithmetic operations.
- Including constraints and usage examples further improved the code by adding proper error handling, documentation, and clearer structure.

Output:

```
# Example usage  
print(calculator(10, 5, '*'))  
  
... 50
```

## Explanation

### Task – 2

Prompt: Write a Python function to sort student marks in descending order. Marks should be integers between 0 and 100.

```
[4]
✓ 0s
def sort_marks(marks):
    valid_marks = [m for m in marks if 0 <= m <= 100]
    return sorted(valid_marks, reverse=True)
```

This task focused on improving AI output by refining vague prompts into specific ones.

- A vague prompt resulted in a basic sorting function without a defined order or validation.
- When sorting order and constraints (valid mark range) were explicitly mentioned, the AI produced a more accurate and meaningful solution.
- The refined prompt led to better logic, including filtering invalid values and sorting in the correct order.

### Output:

```
[5]
✓ 0s
print(sort_marks([78, 95, 120, 67, -5]))

[95, 78, 67]
```

### Task–

3

```
[6]
✓ 0s
def is_prime(n):
    if n <= 1:
        return False
    for i in range(2, int(n ** 0.5) + 1):
        if n % i == 0:
            return False
    return True
```

Explanation

Prompt:

Create a Python function `is_prime(n)` that checks whether a given number is prime.

Examples:

`is_prime(2) → True` `is_prime(3)`

`→ True` `is_prime(4) → False`

`is_prime(17) → True` `is_prime(1)`

`→ False` `is_prime(0) → False`

Few-shot prompting involves

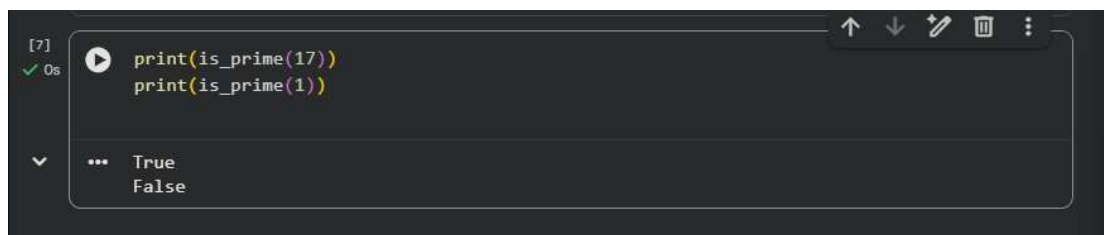
providing example inputs and

expected outputs along with the

prompt.

- By including multiple examples, the AI clearly understood how to handle edge cases such as 0 and 1.
- The generated code correctly implemented an optimized prime-checking algorithm.
- Compared to zero-shot prompting, few-shot prompting significantly improved correctness and efficiency

Output:



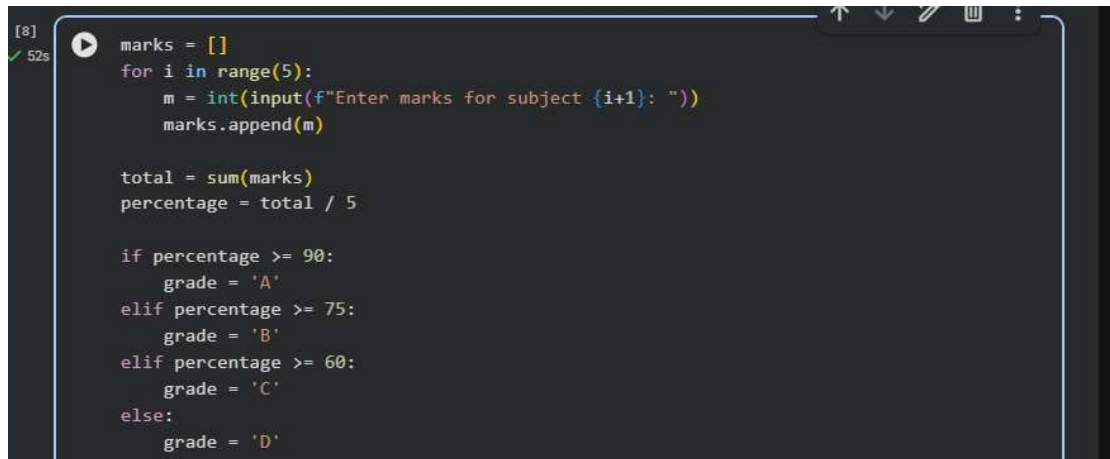
The screenshot shows a Jupyter Notebook interface. At the top, there is a toolbar with icons for undo, redo, insert code, insert text, and a menu. Below the toolbar, the code cell contains two lines of Python code: `print(is_prime(17))` and `print(is_prime(1))`. The code is highlighted in blue. Below the code, the output is displayed, showing the results of the function calls: `True` and `False`.


Explanation

Task-4 Prompt:

Create a simple Python-based user interface for a student grading system. The program should:

- Ask the user to enter marks for 5 subjects
- Calculate total marks
- Calculate percentage
- Display grade based on percentage



```
[8] 52s  marks = []
for i in range(5):
    m = int(input(f"Enter marks for subject {i+1}: "))
    marks.append(m)

total = sum(marks)
percentage = total / 5

if percentage >= 90:
    grade = 'A'
elif percentage >= 75:
    grade = 'B'
elif percentage >= 60:
    grade = 'C'
else:
    grade = 'D'
```

### Explanation

This task demonstrated how a structured and detailed prompt can guide AI to create a complete user-interface-based program.

The prompt clearly specified user input, calculations, and output requirements.

As a result, the AI generated a well-structured program that calculates total marks, percentage, and grade.

The code followed a logical flow, making it easy to understand and userfriendly.

Output:

```
print("Total Marks:", total)
print("Percentage:", percentage)
print("Grade:", grade)

... Enter marks for subject 1: 10
Enter marks for subject 2: 20
Enter marks for subject 3: 30
Enter marks for subject 4: 40
Enter marks for subject 5: 50
Total Marks: 150
Percentage: 30.0
Grade: D
```

Task – 5:

Prompt:

Create two Python functions:

1. Convert kilometers to miles
2. Convert miles to kilometers

Use accurate conversion formulas and return the result.

```
[9]
✓ Os
def km_to_miles(km):
    return km * 0.621371

def miles_to_km(miles):
    return miles / 0.621371
```

### Explanation

This task analyzed how prompt specificity affects accuracy and code quality.

A vague prompt produced an unclear and inaccurate conversion function.

A more specific prompt resulted in correct and separate functions for each unit conversion.

Explicit instructions ensured the use of correct formulas and meaningful function names.

Output:

```
[10]
✓ 0s      print(km_to_miles(10))
          print(miles_to_km(6.2))

        6.21371
        9.977935886933894
```

## Conclusion

Across all tasks, it was observed that:

- AI performance improves with clear, structured, and specific prompts.
- Adding comments, constraints, and examples significantly enhances output quality.
- Prompt engineering is a critical skill for effective AI-assisted programming.