

AI ASSISTED CODING

Assignment-3.2

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Batch-40

Task Description-1

- Progressive Prompting for Calculator Design: Ask the AI to design a simple calculator

program by initially providing only the function name. Gradually enhance the prompt by

adding comments and usage examples.

Expected Output-1

- Comparison showing improvement in AI-generated calculator logic and structure.

Code and Output:

```
simple.py Assignment-3.1.py Banking.py Assignment-3.2.py

#Assignment-3.2.py >
1 #Task-1
2 #write a python program to develop a simple calculator using functions
3 #check for addition,subtraction,multiplication,division
4 #Give user some options to choose the operation
5 #Print the result accordingly
6
7 def add(x, y):
8     return x + y
9
10 def subtract(x, y):
11     return x - y
12
13 def multiply(x, y):
14     return x * y
15
16 def divide(x, y):
17     if y == 0:
18         return "Error! Division by zero."
19     return x / y
20
21 print("Simple Calculator")
22 print("Select operation:")
23 print("1. Add")
24 print("2. Subtract")
25 print("3. Multiply")
26 print("4. Divide")
27 while True:
28     choice = input("Enter choice (1/2/3/4) or 'q' to quit: ")
29     if choice == 'q':
30         break
31     if choice in ['1', '2', '3', '4']:
32         num1 = float(input("Enter first number: "))
33         num2 = float(input("Enter second number: "))
34         if choice == '1':
35             print(f"{num1} + {num2} = {add(num1, num2)}")
36         elif choice == '2':
37             print(f"{num1} - {num2} = {subtract(num1, num2)}")
38         elif choice == '3':
39             print(f"{num1} * {num2} = {multiply(num1, num2)}")
40         elif choice == '4':
41             print(f"{num1} / {num2} = {divide(num1, num2)}")
42     else:
43         print("Invalid input")
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```

File Edit Selection View Go Run Terminal Help AI-ASSIS
Assignment-3.1.py Assignment-3.2.py Banking.py Assignment-3.2.py
simple.py
Assignment-3.2.py
35     print(f"({num1}) - ({num2}) = {subtract(num1, num2)}")
36 elif choice == 'A':
37     print(f"({num1}) * ({num2}) = {multiply(num1, num2)}")
38 else:
39     print("Invalid input")
Assignment-3.2.py
Simple Calculator
Select operation:
1. Add
2. Subtract
3. Multiply
4. Divide
Enter choice (1/2/3/4) or 'q' to quit: 2
2. Divide
Enter choice (1/2/3/4) or 'q' to quit: 2
Enter first number: 50
Enter second number: 30
50.0 - 30.0 = 20.0
Enter choice (1/2/3/4) or 'q' to quit:

```

Analysis:

Analysis: Progressive Prompting for Calculator Design

Progressive prompting means giving instructions step by step to the AI.

First, only the function name is given, so the output is basic.

Next, comments are added to explain what the calculator should do.

Then, usage examples are included to show how the program works.

Each step improves clarity and accuracy of the AI response.

This method helps in getting a complete and correct calculator program.

Task Description-2

- Refining Prompts for Sorting Logic: Start with a vague prompt for sorting student marks,

then refine it to clearly specify sorting order and constraints.

Expected Output-2

- AI-generated sorting function evolves from ambiguous logic to an accurate and efficient implementation.

Code and Output:

The screenshot shows a Windows desktop environment with the Visual Studio Code (VS Code) application open. The main editor area displays a Python script named `Assignment-3.2.py`. The script prompts the user for a list of student marks separated by spaces, sorts them, and prints the sorted list. It includes validation to ensure marks are between 0 and 100. The terminal below shows the script being run in a Python 3 environment, with the output matching the code's logic.

```
simple.py Assignment-3.1.py Banking.py Assignment-3.2.py
Assignment-3.2.py > ...
39
40 #Task-2
41 #write a python program to sort the students marks print after sorting
42 #The code should have dynamic input from the user
43 #Constraints:Ensure all marks are between 0 and 100
44 #Print the output after sorting
45 Tabnine [Edit] [Test] [Explode] [Document]
46 def sort_marks(marks_list):
47     return sorted(marks_list)
48 user_input = input("Enter student marks separated by spaces: ")
49 marks_list = list(map(int, user_input.split()))
50 sorted_marks = sort_marks(marks_list)
51 print("Sorted student marks:", sorted_marks)
52 for mark in marks_list:
53     if mark < 0 or mark > 100:
54         print(f"Invalid mark found: {mark}. Marks should be between 0 and 100.")
55         break
56 else:
57     print("All marks are valid.")
58
59

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS> & c:/users/nalla/appData/local/Programs/Python/Python31\python.exe c:/users/nalla/OneDrive/Documents/Desktop/AI-ASSIS/Assignment-3.2.py
Enter student marks separated by spaces: 98 45 76 89 12 98 100 56
Sorted student marks: [12, 45, 56, 76, 89, 98, 100]
All marks are valid.

PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS> & c:/users/nalla/appData/local/Programs/Python/Python31\python.exe c:/users/nalla/OneDrive/Documents/Desktop/AI-ASSIS/Assignment-3.2.py
Enter student marks separated by spaces: 99 100 56 76 89 54 34 77 49
Sorted student marks: [34, 49, 54, 56, 76, 77, 89, 99, 100]
All marks are valid.

PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS>

```

CHAT RECENT SESSIONS

- General greeting inquiry
- Completed

Local • 1 wk Show More

Build with Agent

AI responses may be inaccurate.

Generate Agent Instructions to onboard AI onto your codebase.

Launchpad

File Edit Selection View Go Run Terminal Help

Search

14:18 20-01-2024

Analysis:

Refining Prompts for Sorting Logic

Initially, a vague prompt is given to sort student marks.

Due to less clarity, the AI may give an incomplete or unclear solution.

The prompt is then refined to specify sorting order (ascending or descending).

Additional constraints (such as valid marks or number of students) are added.

Clear instructions help the AI produce accurate and expected output.

Refining prompts reduces confusion and errors in the solution.

Task Description-3

- Few-Shot Prompting for Prime Number Validation: Provide multiple input-output

examples for a function that checks whether a number is prime. Observe how few-shot

prompting improves correctness.

Expected Output-3

- Improved prime-checking function with better edge-case handling.

Code and Output:

The screenshot shows a code editor interface with several tabs open. The active tab contains Python code for checking if a number is prime. The code uses a function `is_prime` to determine if a given number is prime or not. It includes edge cases for numbers less than or equal to 3. For numbers greater than 3, it checks divisibility from 5 up to the square root of the number. The code then prompts the user for input, reads it, and prints whether it is a prime number or not.

```
#Write a python code to find whether the given number is prime or not in best case
#E.g Input: 29 → Output: Prime Number
#Input: 15 → Output: Not a Prime Number

def is_prime(number):
    #check for edge cases
    if number <= 1:
        return False
    if number <= 3:
        return True
    if number % 2 == 0 or number % 3 == 0:
        return False
    i = 5
    while i * i <= number:
        if number % i == 0 or number % (i + 2) == 0:
            return False
        i += 6
    return True

user_input = int(input("Enter a number: "))
if is_prime(user_input):
    print(f"{user_input} is a Prime Number.")
else:
    print(f"{user_input} is Not a Prime Number.")


```

The terminal below the code shows the execution of the script. It first imports the script, then runs it, and finally prints the results for two test cases: 63 and 3. The output indicates that 63 is not a prime number and 3 is a prime number.

```
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS> & c:/users/nalla/appData/Local/Programs/Python/Python311/python.exe c:/users/nalla/OneDrive/Documents/Desktop/AI-ASSIS/Assignment-3.2.py
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS> & c:/users/nalla/appData/Local/Programs/Python/Python311/python.exe c:/users/nalla/OneDrive/Documents/Desktop/AI-ASSIS/Assignment-3.2.py
Enter a number: 63
63 is Not a Prime Number.
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS> & c:/users/nalla/appData/Local/Programs/Python/Python311/python.exe c:/users/nalla/OneDrive/Documents/Desktop/AI-ASSIS/Assignment-3.2.py
Enter a number: 3
3 is a Prime Number.
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS>
```

Analysis:

Few-Shot Prompting for Prime Number Validation

Few-shot prompting means giving multiple input-output examples to the AI.

The examples show how prime and non-prime numbers behave.

This helps the AI understand the exact logic of prime number checking.

The AI produces more correct and reliable results.

Errors are reduced compared to a prompt with no examples.

Few-shot prompting improves accuracy and consistency of the function.

Task Description-4

- Prompt-Guided UI Design for Student Grading System: Create a user interface for a student grading system that calculates total marks, percentage, and grade based on user input.

Expected Output-4

- Well-structured UI code with accurate calculations and clear output display.

Code and Output:

```
File Edit Selection View Go Run Terminal Help ⏎ ↵ AI-ASSIS
Assignment-3.1.py Assignment-3.2.py Banking.py Assignment-3.2.py X
Assignment-3.2.py ...
#Write a python program to create interface for student grading system
#It should take student name,marks in different subjects,total marks,percentage
#Based on the percentage provide grades for the student
#It should calculate each subject marks then total and percentage
#Create a user interface for student grading system it should have boxes for input and output
#UI design for Student Grading System
import tkinter as tk
from tkinter import messagebox

def calculate_grade():
    try:
        name = entry_name.get()
        subject1 = float(entry_subject1.get())
        subject2 = float(entry_subject2.get())
        subject3 = float(entry_subject3.get())
        total_marks = subject1 + subject2 + subject3
        percentage = (total_marks / 300) * 100

        if percentage >= 90:
            grade = 'A'
        elif percentage >= 80:
            grade = 'B'
        elif percentage >= 70:
            grade = 'C'
        elif percentage >= 60:
            grade = 'D'
        else:
            grade = 'F'

        messagebox.showinfo("Grading Result", f"Student Name: {name}\nTotal Marks: {total_marks}\nPercentage: {percentage:.2f}%\nGrade: {grade}")
    except ValueError:
        messagebox.showerror("Input Error", "Please enter valid marks.")

Student Name: madhu ...
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS>

```

```
File Edit Selection View Go Run Terminal Help ⏎ ↵ AI-ASSIS
Assignment-3.1.py Assignment-3.2.py Banking.py Assignment-3.2.py X
Assignment-3.2.py ...
def calculate_grade():
    result = f"Student Name: {name}\nTotal Marks: {total_marks}\nPercentage: {percentage:.2f}%\nGrade: {grade}"
    messagebox.showinfo("Grading Result", result)
except ValueError:
    messagebox.showerror("Input Error", "Please enter valid marks.")

# Create the main window
root = tk.Tk()
root.title("Student Grading System")
# Create and place labels and entry boxes
tk.Label(root, text="Student Name:").grid(row=0, column=0)
entry_name = tk.Entry(root)
entry_name.grid(row=0, column=1)
tk.Label(root, text="Subject 1 Marks:").grid(row=1, column=0)
entry_subject1 = tk.Entry(root)
entry_subject1.grid(row=1, column=1)
tk.Label(root, text="Subject 2 Marks:").grid(row=2, column=0)
entry_subject2 = tk.Entry(root)
entry_subject2.grid(row=2, column=1)
tk.Label(root, text="Subject 3 Marks:").grid(row=3, column=0)
entry_subject3 = tk.Entry(root)
entry_subject3.grid(row=3, column=1)
# Create and place the Calculate Grade button
btn_calculate = tk.Button(root, text="Calculate Grade", command=calculate_grade)
btn_calculate.grid(row=4, columnspan=2)
# Run the application
root.mainloop()

Student Name: Madhuvani
Subject 1 Marks: 98
Subject 2 Marks: 89
Subject 3 Marks: 70
Calculate Grade
Grading Result
Student Name: Madhuvani
Total Marks: 257.0
Percentage: 85.67%
Grade: B
OK

```

Analysis:

Prompt-Guided UI Design for Student Grading System

Prompt-guided design gives clear instructions for UI creation.

The prompt specifies inputs like student marks.

The system calculates total marks and percentage automatically.

It assigns grades based on rules given in the prompt.

Clear prompts help design a user-friendly interface.

Prompt guidance reduces errors and confusion in UI behavior.

Task Description-5

- Analyzing Prompt Specificity in Unit Conversion Functions: Improving a Unit Conversion Function (Kilometers to Miles and Miles to Kilometers) Using Clear Instructions.

Expected Output-5

- Analysis of code quality and accuracy differences across multiple prompt variations.

Code and Output:

The screenshot shows a code editor interface with several tabs open. The active tab is 'Assignment-3.2.py'. The code implements a function to convert kilometers to miles and vice versa. It includes a menu bar with File, Edit, Selection, View, Go, Run, Terminal, Help, and a toolbar with various icons. On the left is a sidebar with file navigation. A 'RECENT SESSIONS' panel on the right shows a completed session. A 'Build with Agent' panel is visible on the right side of the editor window.

```
136 #Task -5
137 #write a python program to implement conversion of Kilometer to miles and miles to kilometer
138 def km_to_miles(km):
139     return km * 0.621371
140 def miles_to_km(miles):
141     return miles / 0.621371
142 print("Conversion Options:")
143 print("1. Kilometer to Miles")
144 print("2. Miles to Kilometer")
145 choice = input("Enter choice (1/2): ")
146
147 if choice == '1':
148     km = float(input("Enter distance in kilometers: "))
149     miles = km_to_miles(km)
150     print(f'{km} kilometers is equal to {miles:.2f} miles.')
151 elif choice == '2':
152     miles = float(input("Enter distance in miles: "))
153     km = miles_to_km(miles)
154     print(f'{miles} miles is equal to {km:.2f} kilometers.')
155 else:
156     print("Invalid choice.")
```

TERMINAL

```
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS> & c:/users/nalla/appData/Local/Programs/Python/Python311/python.exe c:/users/nalla/OneDrive/Documents/Desktop/AI-ASSIS/Assignment-3.2.py
80.0 kilometers is equal to 49.71 miles.
PS C:\Users\nalla\OneDrive\Documents\Desktop\AI-ASSIS>
```

Analysis:

Prompt Specificity in Unit Conversion Functions

Prompt specificity means giving clear and detailed instructions.

Initially, a vague prompt may cause incorrect or incomplete conversion.

Clear instructions specify conversion type (km to miles, miles to km).

The prompt defines input and output format clearly.

Specific prompts improve accuracy and correctness of the function.

This reduces errors and misunderstanding in unit conversion.