

AI ASSISTED CODING

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LAB ASSIGNMENT-6.3

Task Description -1:

Use AI to complete a Student class with attributes and a method.

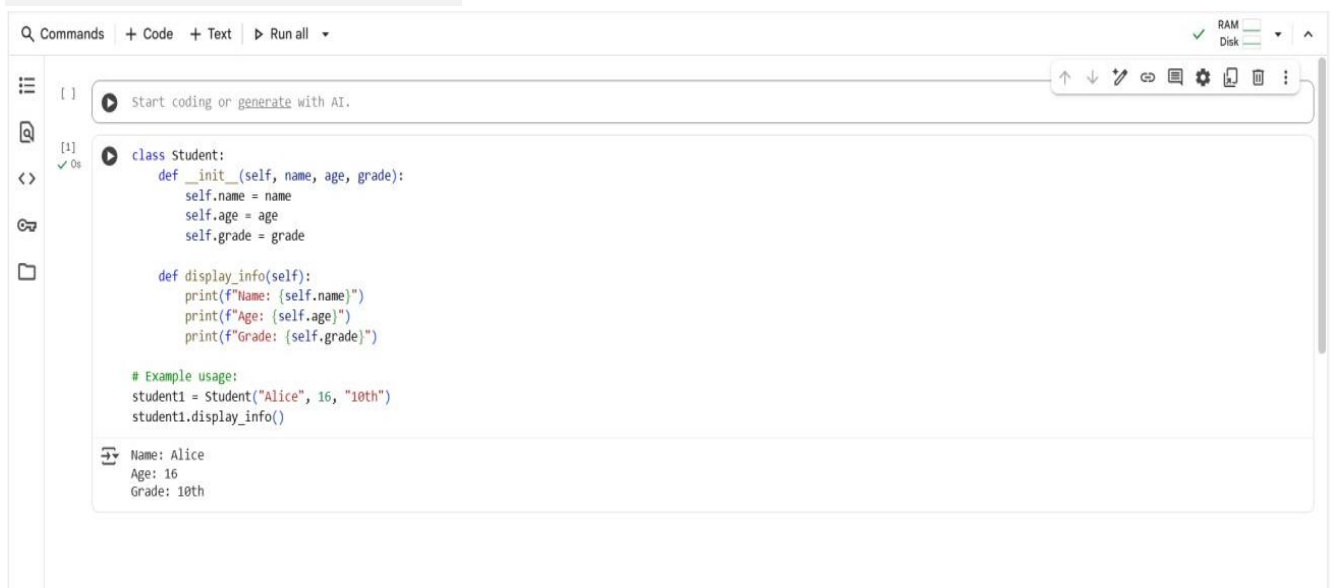
Check output

Analyze the code generated by AI tool.

PROMPT:

Write a Python class called Student with attributes like name, age, and grade.
Add a method to display the student's information. After generating the code, check the output and analyze the logic for clarity and correctness.

CODE with OUTPUT:



```
[ ] Start coding or generate with AI.

[1] ✓ 0s
class Student:
    def __init__(self, name, age, grade):
        self.name = name
        self.age = age
        self.grade = grade

    def display_info(self):
        print(f"Name: {self.name}")
        print(f"Age: {self.age}")
        print(f"Grade: {self.grade}")

# Example usage:
student1 = Student("Alice", 16, "10th")
student1.display_info()
```

↕ Name: Alice
Age: 16
Grade: 10th

COMMENT:

Class Definition:

- `class Student:` : This line defines a new class named `Student`. Classes are blueprints for creating objects (like individual students in this case).
- `"""Represents a student with name, age, grade, and hall ticket number."""` : This is a docstring, which explains what the class does.
- `__init__(self, name, age, grade, hall_ticket_number):` : This is the constructor method. It's called when you create a new `Student` object.
 - `self` : Refers to the instance of the class being created.
 - `name, age, grade, hall_ticket_number` : These are parameters that you pass when creating a `Student` object.
 - `self.name = name` : This line assigns the value of the `name` parameter to the `name` attribute of the object. The same applies to `age, grade, and hall_ticket_number`.

Methods:

- `display_info(self):` : This is a method (a function within a class) that displays the student's information.
 - `self` : Again, refers to the instance of the class.
 - `print(f"...")` : These lines print the student's details using f-strings for easy formatting. They access the attributes using `self.attribute_name`.

User Input and Object Creation:

- `name = input("Enter student name: ")` : This line prompts the user to enter the student's name and stores it in the `name` variable. The same applies to `age, grade, and hall_ticket_number`. Note that `age` is converted to an integer using `int()`.
- `user_student = Student(name, age, grade, hall_ticket_number)` : This line creates a new `Student` object using the input provided by the user and assigns it to the `user_student` variable.
- `user_student.display_info()` : This line calls the `display_info` method on the `user_student` object to display the information entered by the user.

Task Description -2:

Prompt AI to complete a function that prints the first 10 multiples of a number using a loop.

Analyze the generated code

Ask AI to generate code using other controlled looping.

PROMPT:

Write a Python function that prints the first 10 multiples of a given number using a loop. Then rewrite the function using a different loop type and compare both versions.

CODE WITH OUTPUT:

The image shows a code editor interface with two tabs. The top tab contains a Python function `print_multiples` that takes a number and prints its first 10 multiples using both a `for` loop and a `while` loop. The bottom tab shows the output of running this code, displaying the multiples of 6 for both loop types.

```
[ ] Start coding or generate with AI.

[4] ✓ 0s
def print_multiples(number):
    """Prints the first 10 multiples of a given number using a for loop and a while loop."""

    print(f"Multiples of {number} (using for loop):")
    for i in range(1, 11):
        print(number * i)

    print(f"\nMultiples of {number} (using while loop):")
    count = 1
    while count <= 10:
        print(number * count)
        count += 1

    # Example usage:
    print_multiples(6)

Multiples of 6 (using for loop):
6
12
18
24
30
36
42
48
54
60

Multiples of 6 (using while loop):
6
12
18
24
30
36
42
48
54
60
```

COMPARISON:

Comparison of `print_multiples_for` and `print_multiples_while`

Both `print_multiples_for` and `print_multiples_while` functions successfully achieve the task of printing the first 10 multiples of a given number. However, they utilize different types of loops, leading to differences in their implementation and typical use cases.

Core Difference in Iteration:

- **`print_multiples_for` (using `for` loop and `range`):** The `for` loop with `range(1, 11)` directly handles the iteration over a sequence of numbers from 1 to 10. The loop variable `i` automatically takes on each value in this sequence in each iteration. This approach is concise and explicitly defines the range of iteration.
- **`print_multiples_while` (using `while` loop):** The `while` loop requires manual management of the iteration counter. We initialize a variable `count` to 1 before the loop and increment it (`count += 1`) within the loop. The loop continues as long as the condition `count <= 10` is true. This approach is more verbose for a fixed number of iterations as it requires explicit initialization and incrementing of the counter.

Readability and Use Cases:

- **`for` loop:** In this context, where the number of iterations is fixed and known beforehand (10 times), the `for` loop with `range` is generally considered more readable and Pythonic. It clearly indicates that we are iterating a specific number of times. `for` loops are typically used when you need to iterate over a sequence (like a list, tuple, string, or the output of `range`) or when the number of iterations is predetermined.
- **`while` loop:** The `while` loop is more suitable when the number of iterations is not known in advance and depends on a condition being met. For example, you might use a `while` loop to read lines from a file until the end of the file is reached, or to continue processing user input until a specific keyword is entered. While a `while` loop can be used for a fixed number of iterations as

SUMMARY:

Summary of Solving Process

The user requested two Python functions to print the first 10 multiples of a number, one using a `for` loop and the other a `while` loop, and then a comparison of the two functions.

1. **`for` loop function:** A Python function `print_multiples_for` was created using a `for` loop with `range(1, 11)` to iterate 10 times and print the multiples. This function was later modified to take the number as input from the user.
2. **`while` loop function:** A second Python function `print_multiples_while` was created using a `while` loop with a counter initialized before the loop and incremented inside, continuing as long as the counter was less than or equal to 10. This function was also later modified to take the number as input from the user.
3. **Comparison:** A markdown comparison was provided, detailing the implementation differences (automatic iteration with `for` / `range` vs. manual counter management with `while`) and discussing the typical use cases and readability of each loop type for a fixed number of iterations.

Data Analysis Key Findings

- The `print_multiples_for` function successfully printed the first 10 multiples using a `for` loop and `range(1, 11)`.
- The `print_multiples_while` function successfully printed the first 10 multiples using a `while` loop and manual counter management.
- Both functions were successfully modified to take user input for the number.
- For a fixed and known number of iterations, the `for` loop with `range` is generally considered more concise and readable in Python compared to a `while` loop which requires explicit counter initialization and incrementing.
- `for` loops are typically used for iterating over sequences or when the number of iterations is predetermined, while `while` loops are more suitable when the loop termination depends on a condition that may change during execution.

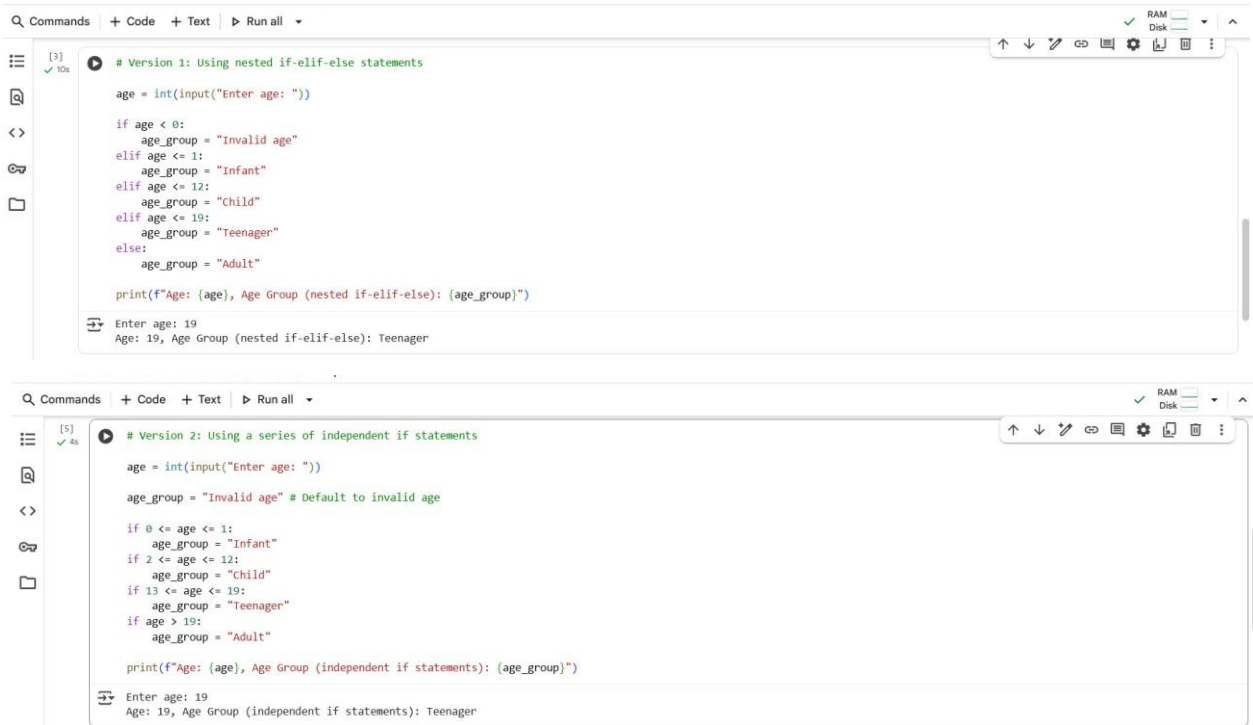
Task Description -3:

Ask AI to write nested if-elif-else conditionals to classify age groups. Analyze the generated code Ask AI to generate code using other conditional statements. write perfect and simple prompt for this question.

PROMPT:

Write Python code using nested if-elif-else statements to classify age groups like infant, child, teenager, and adult. Then rewrite the code using a different conditional method and compare both versions.

CODE with OUTPUT:



```
[3] ✓ 10s # Version 1: Using nested if-elif-else statements

age = int(input("Enter age: "))

if age < 0:
    age_group = "Invalid age"
elif age <= 1:
    age_group = "Infant"
elif age <= 12:
    age_group = "Child"
elif age <= 19:
    age_group = "Teenager"
else:
    age_group = "Adult"

print(f"Age: {age}, Age Group (nested if-elif-else): {age_group}")

Enter age: 19
Age: 19, Age Group (nested if-elif-else): Teenager
```

```
[5] ✓ 4s # Version 2: Using a series of independent if statements

age = int(input("Enter age: "))

age_group = "Invalid age" # Default to invalid age

if 0 <= age <= 1:
    age_group = "Infant"
if 2 <= age <= 12:
    age_group = "Child"
if 13 <= age <= 19:
    age_group = "Teenager"
if age > 19:
    age_group = "Adult"

print(f"Age: {age}, Age Group (independent if statements): {age_group}")

Enter age: 19
Age: 19, Age Group (independent if statements): Teenager
```


Generate a sum_to_n() function to calculate sum of first n numbers

- Analyze the generated code
- Get suggestions from AI with other controlled looping.

PROMPT:

write a python code to create a function as sum_to_n() function to calculate sum of first n numbers using other conditional statements ask input from the user.

CODE WITH OUTPUT:



```
def sum_to_n(n):
    """calculates the sum of the first n numbers using recursion."""
    if n <= 0:
        return 0
    else:
        return n + sum_to_n(n - 1)

# Get input from the user
try:
    num = int(input("Enter a positive integer: "))
    if num < 0:
        print("Please enter a positive integer.")
    else:
        result = sum_to_n(num)
        print(f"The sum of the first {num} numbers is: {result}")
except ValueError:
    print("Invalid input. Please enter an integer.")

Enter a positive integer: 10
The sum of the first 10 numbers is: 55
```

Task Description -5:

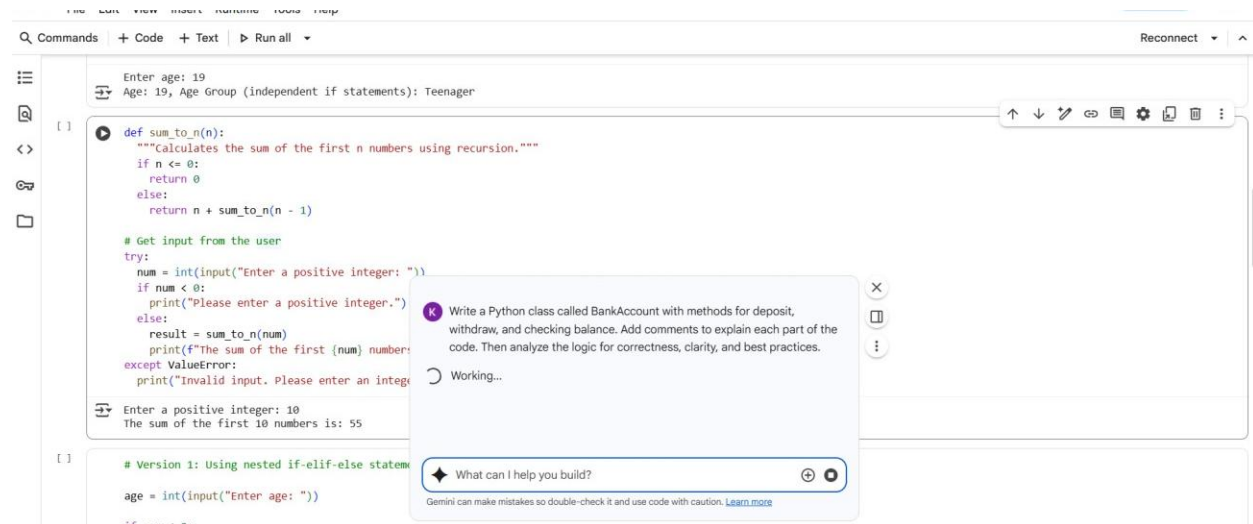
Use AI to build a BankAccount class with deposit, withdraw, and balance methods.

- Analyze the generated code
- Add comments and explain code.

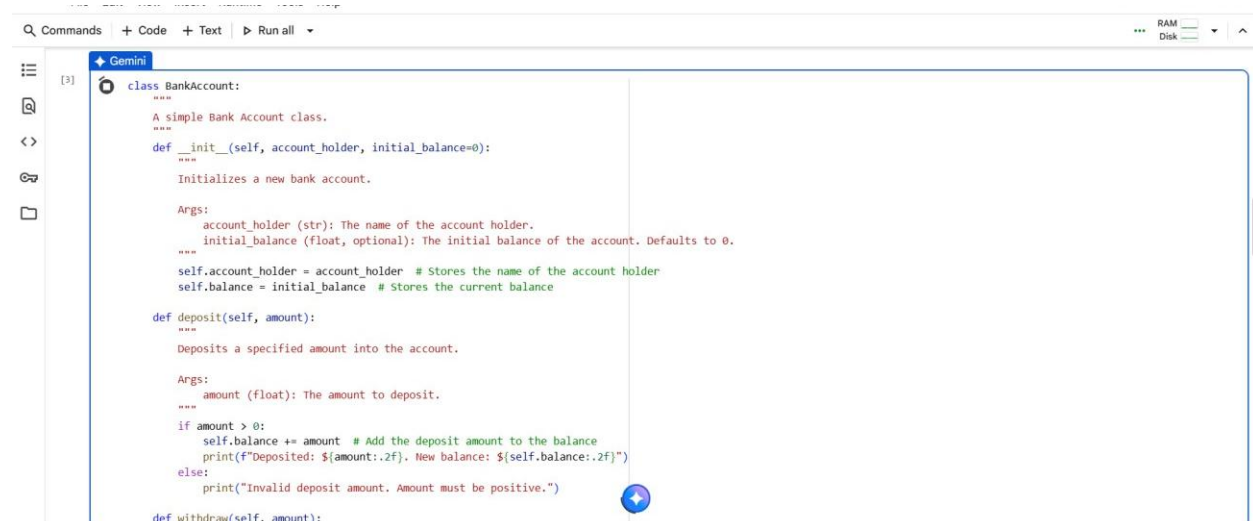
PROMPT:

Write a Python class called `BankAccount` with methods for `deposit`, `withdraw`, and checking `balance`. Add comments to explain each part of the code. Then analyze the logic for correctness, clarity, and best practices.

QUESTION:



CODE:




```
Q Commands + Code + Text ▶ Run all RAM Disk
[3]
def withdraw(self, amount):
    """
    Withdraws a specified amount from the account.

    Args:
        amount (float): The amount to withdraw.
    """
    if amount <= 0:
        print("Invalid withdrawal amount. Amount must be positive.")
    elif amount > self.balance:
        print("Insufficient funds.")
    else:
        self.balance -= amount # Subtract the withdrawal amount from the balance
        print(f"Withdrew: ${amount:.2f}. New balance: ${self.balance:.2f}")

def check_balance(self):
    """
    Displays the current account balance.
    """
    print(f"Current balance for {self.account_holder}: ${self.balance:.2f}")

# Example usage with user input:
account_holder_name = input("Enter account holder name: ")
initial_deposit = float(input("Enter initial deposit amount: "))

# Create an account
my_account = BankAccount(account_holder_name, initial_deposit)

# Perform some transactions with user input
deposit_amount = float(input("Enter amount to deposit: "))
my_account.deposit(deposit_amount)

withdraw_amount = float(input("Enter amount to withdraw: "))
my_account.withdraw(withdraw_amount)

# Check the balance
my_account.check_balance()

# Example of insufficient funds with user input
withdraw_large_amount = float(input("Enter a large amount to attempt to withdraw: "))
my_account.withdraw(withdraw_large_amount)
```

OUTPUT:

```
Q Commands + Code + Text ▶ Run all RAM Disk
[3] ✓ 1m my_account.check_balance()

# Example of insufficient funds with user input
# withdraw_large_amount = float(input("Enter a large amount to attempt to withdraw: "))
# my_account.withdraw(withdraw_large_amount)

Enter account holder name: manohar
Enter initial deposit amount: 20000
Enter amount to deposit: 10000
Deposited: $10000.00, New balance: $30000.00
Enter amount to withdraw: 20000
Withdrew: $20000.00, New balance: $10000.00
Current balance for manohar: $10000.00
```

EXPLANATION:

1. **# Example User Interaction:** : This is a comment indicating that the following lines are an example of how a user would interact with the `BankAccount` class.
2. **# Create a bank account** : Another comment explaining the next line.
3. **my_account = BankAccount(1000)** : This line creates an *instance* of the `BankAccount` class. Think of `my_account` as a specific bank account object. When `BankAccount(1000)` is called, the `__init__` method within the `BankAccount` class is executed, setting the initial balance of this new account to 1000.
4. **# Get user input for deposit** : Comment for the deposit part.
5. **deposit_amount = float(input("Enter amount to deposit: "))** : This line prompts the user to type in a value after displaying the message "Enter amount to deposit: ". The `input()` function reads whatever the user types as a string. `float()` then converts that string into a floating-point number (a number with a decimal point), and this value is stored in the variable `deposit_amount`.
6. **my_account.deposit(deposit_amount)** : This line calls the `deposit` method on the `my_account` object. The value stored in `deposit_amount` (the number the user entered) is passed as the `amount` argument to the `deposit` method.

7. `# Get user input for withdrawal` : Comment for the withdrawal part.
8. `withdraw_amount = float(input("Enter amount to withdraw: "))` : Similar to the deposit input, this line prompts the user for a withdrawal amount, reads their input as a string, converts it to a floating-point number, and stores it in the `withdraw_amount` variable.
9. `my_account.withdraw(withdraw_amount)` : This line calls the `withdraw` method on the `my_account` object, passing the user's withdrawal amount to the method.
10. `# Check balance` : Comment for the balance check.
11. `print(f"Current balance: ${my_account.get_balance()}")` : This line first calls the `get_balance()` method on the `my_account` object. This method returns the current value of the `balance` attribute. The `print()` function then displays the text "Current balance: \$" followed by the balance value returned by `get_balance()`. The `f""` is an f-string, which allows you to embed the value of variables directly within the string.

---END---

