PROGRAM: B.TECH

SPECIALIZATION: CSE - AIML

COURSE TITLE: AI CODING

SEMESTER : 3RD SEM

NAME OF STUDENT: NAREDDY JASMITHA

ENROLLMENT NO: 2403A51281

BATCH NO: 01

Task Description#1 (Classes)

- Use AI to complete a Student class with attributes and a method.
- Check output
- Analyze the code generated by AI tool.

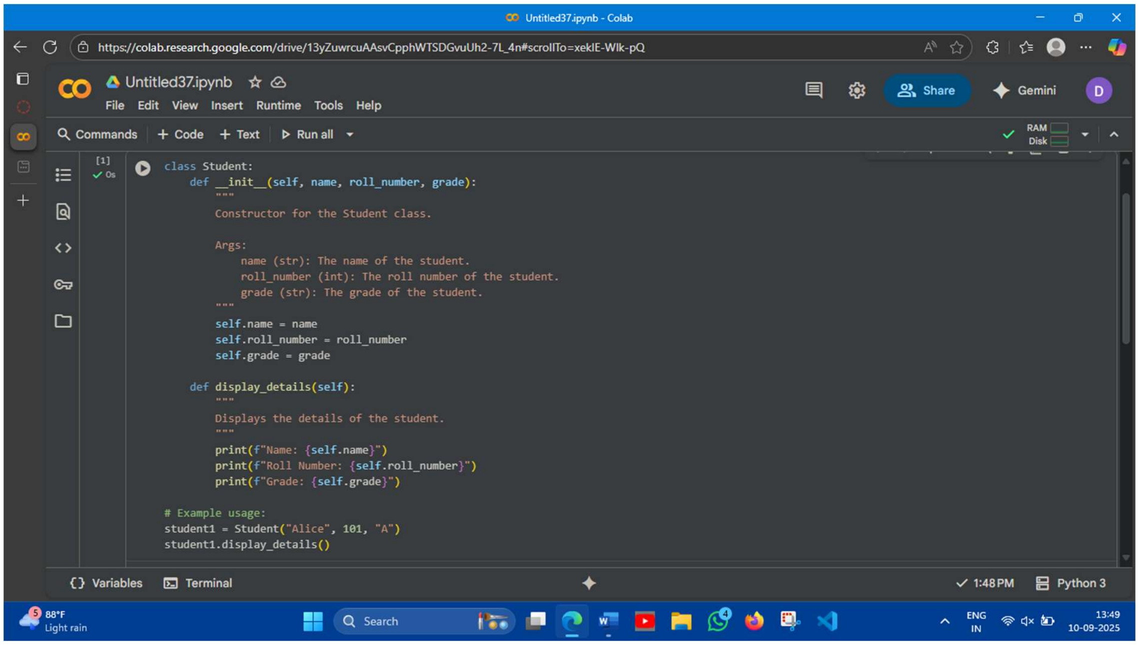
Expected Output#1

- Class with constructor and display_details() method

Prompt:

generate a code for student class with constructor , attributes and display_details() method

screenshots:


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=xeklE-Wlk-pQ
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text ▷ Run all
Share
Gemini
RAM
Disk
[1]
✓ 0s
Variables
Terminal
✓ 1:48 PM
Python 3
88°F
Light rain
Search
ENG
IN
13:49
10-09-2025

```
class Student:
    def __init__(self, name, roll_number, grade):
        """
        Constructor for the Student class.

        Args:
            name (str): The name of the student.
            roll_number (int): The roll number of the student.
            grade (str): The grade of the student.
        """
        self.name = name
        self.roll_number = roll_number
        self.grade = grade

    def display_details(self):
        """
        Displays the details of the student.
        """
        print(f"Name: {self.name}")
        print(f"Roll Number: {self.roll_number}")
        print(f"Grade: {self.grade}")

# Example usage:
student1 = Student("Alice", 101, "A")
student1.display_details()
```

Output:

Name: Alice

Roll Number: 101

Grade: A

Code Analysis:

- **class Student:: This line defines a new class named Student. Classes are blueprints for creating objects (instances).**
- **def __init__(self, name, roll_number, grade):: This is the constructor method. It's called automatically when you create a new Student object.**

- self: Refers to the instance of the class being created.
- name, roll_number, grade: These are parameters that you pass when creating a Student object.
- Inside the constructor, self.name = name, self.roll_number = roll_number, and self.grade = grade assign the values passed as arguments to the object's attributes (properties).

- **def display_details(self):: This defines a method named display_details within the Student class. Methods are functions that belong to a class.**
  - **self: Again, refers to the instance of the class.**
  - **This method prints the name, roll_number, and grade attributes of the Student object in a formatted string.**
- **student1 = Student("Alice", 101, "A"): This line creates an instance of the Student class.**
  - **Student("Alice", 101, "A") calls the constructor with the values "Alice", 101, and "A" for the name, roll_number, and grade parameters, respectively.**
  - **The resulting Student object is assigned to the variable student1.**

- **student1.display_details(): This line calls the display_details method on the student1 object. This executes the code inside the display_details method for student1, printing its details**

Task Description#2 (Loops)

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

• Analyze the generated code

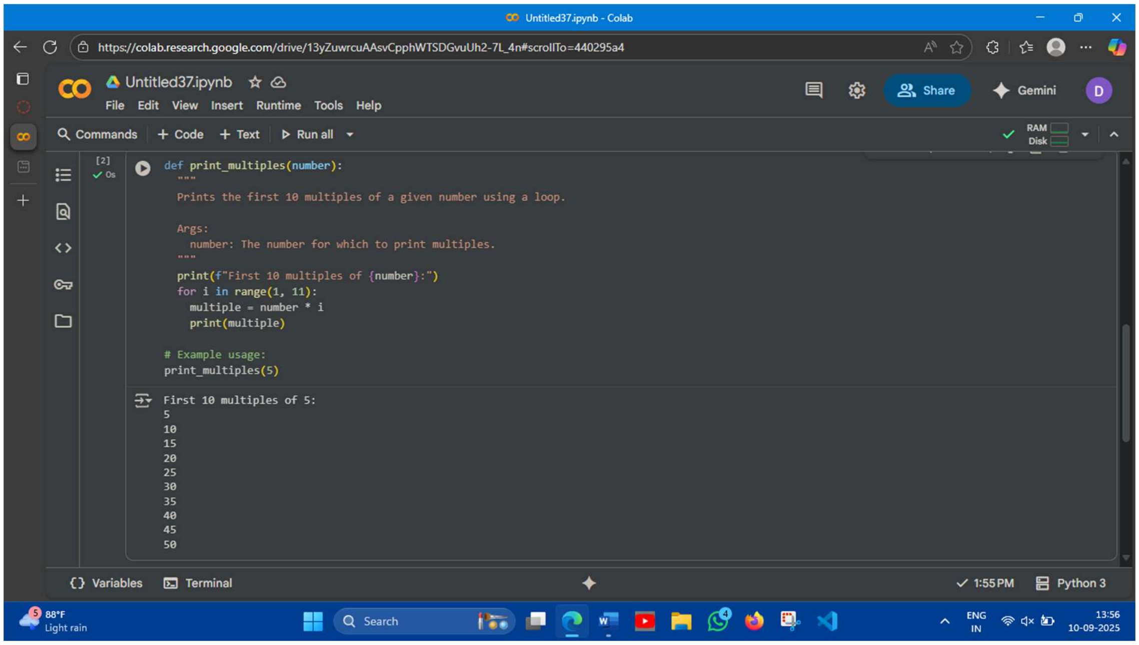
• Ask AI to generate code using other controlled looping

Expected Output#2

• Correct loop-based implementation

Prompt: generate code of function with loops that prints first 10 multiples of numbers

Screenshots:

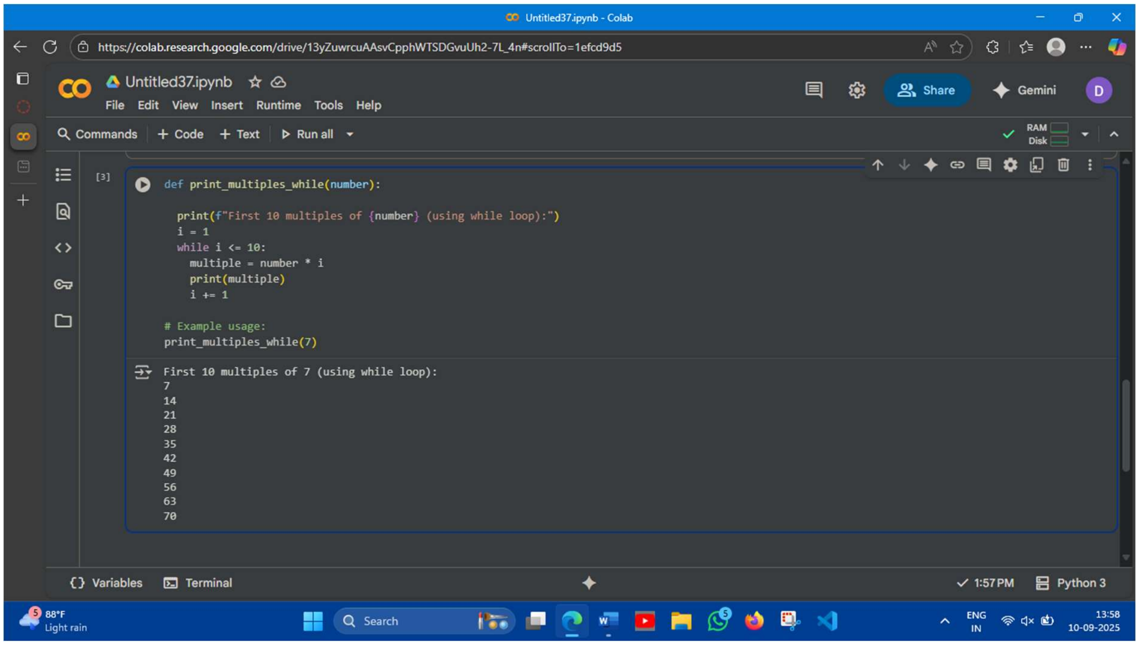

Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=440295a4
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Share Gemini
[2]
Variables Terminal
1:55 PM Python 3
88°F Light rain
Search
13:56 10-09-2025

```
def print_multiples(number):
  """
  Prints the first 10 multiples of a given number using a loop.

  Args:
    number: The number for which to print multiples.
  """
  print(f"First 10 multiples of {number}:")
  for i in range(1, 11):
    multiple = number * i
    print(multiple)

# Example usage:
print_multiples(5)
```

```
First 10 multiples of 5:
5
10
15
20
25
30
35
40
45
50
```

Prompt:

Generate code using other controlled looping


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=1efcd9d5
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Share Gemini
[3]
Variables Terminal
1:57 PM Python 3
88°F Light rain
Search
13:58 10-09-2025

```
def print_multiples_while(number):

  print(f"First 10 multiples of {number} (using while loop):")
  i = 1
  while i <= 10:
    multiple = number * i
    print(multiple)
    i += 1

# Example usage:
print_multiples_while(7)
```

```
First 10 multiples of 7 (using while loop):
7
14
21
28
35
42
49
56
63
70
```

Code Analysis:

- **def print_multiples_while(number):: This line defines a function named print_multiples_while that takes one argument, number.**
- **print(f"First 10 multiples of {number} (using while loop):"): This line prints a descriptive header indicating the output that follows.**
- **i = 1: This initializes a variable i to 1. This variable will act as a counter for the multiples.**
- **while i <= 10:: This is the while loop condition. The code block inside the while loop will continue to execute as long as the value of i is less than or equal to 10.**
- **multiple = number * i: Inside the loop, this line calculates the current multiple by multiplying the input number by the counter i.**
- **print(multiple): This line prints the calculated multiple.**
- **i += 1: This is a crucial step in a while loop. It increments the value of i by 1 in each iteration. This ensures that the loop will eventually terminate when i becomes greater than 10. If this line were missing, the loop would run indefinitely (an infinite loop).**
- **print_multiples_while(7): This line calls the print_multiples_while function with the argument**

7, triggering the execution of the code within the function to print the first 10 multiples of 7.

Task Description#3 (Conditional Statements)

- **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**

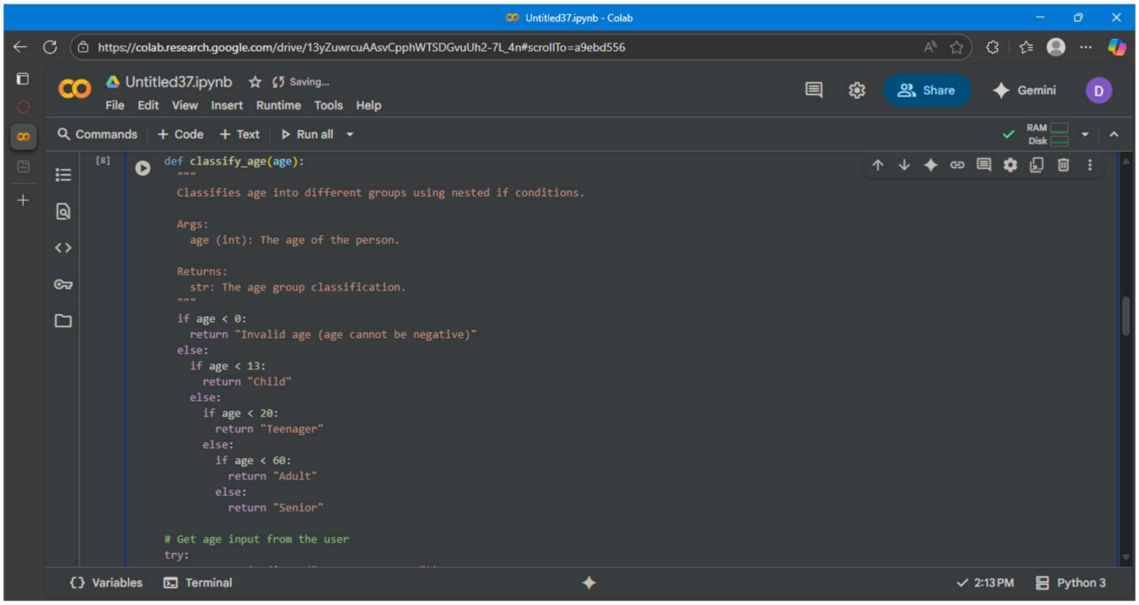
Expected Output#3

- **Age classification function with appropriate conditions and with explanation**

Prompt:

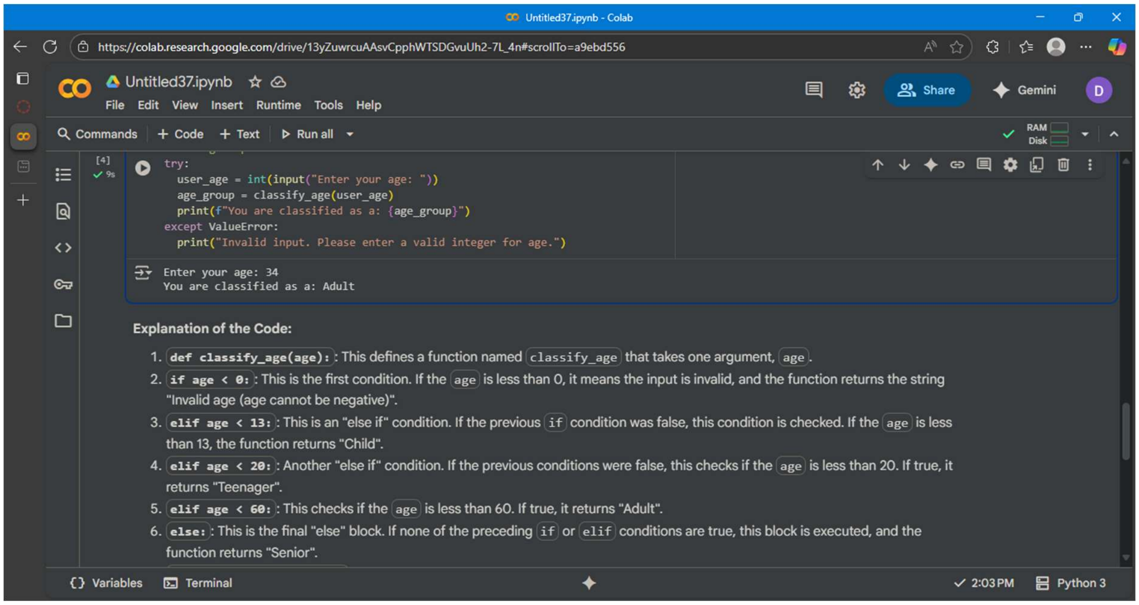
generate code for Age classification function with appropriate conditions and with explanation using if,elif,else conditionals to classify age groups with user given input

Screenshots:


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
Saving...
File Edit View Insert Runtime Tools Help
Share
Gemini
Commands
+ Code
+ Text
Run all
RAM
Disk
[8]
Variables
Terminal
2:13 PM
Python 3

```python
def classify_age(age):
  """
  Classifies age into different groups using nested if conditions.

  Args:
    age (int): The age of the person.

  Returns:
    str: The age group classification.
  """
  if age < 0:
    return "Invalid age (age cannot be negative)"
  else:
    if age < 13:
      return "Child"
    else:
      if age < 20:
        return "Teenager"
      else:
        if age < 60:
          return "Adult"
        else:
          return "Senior"

# Get age input from the user
try:
```

Explaination:

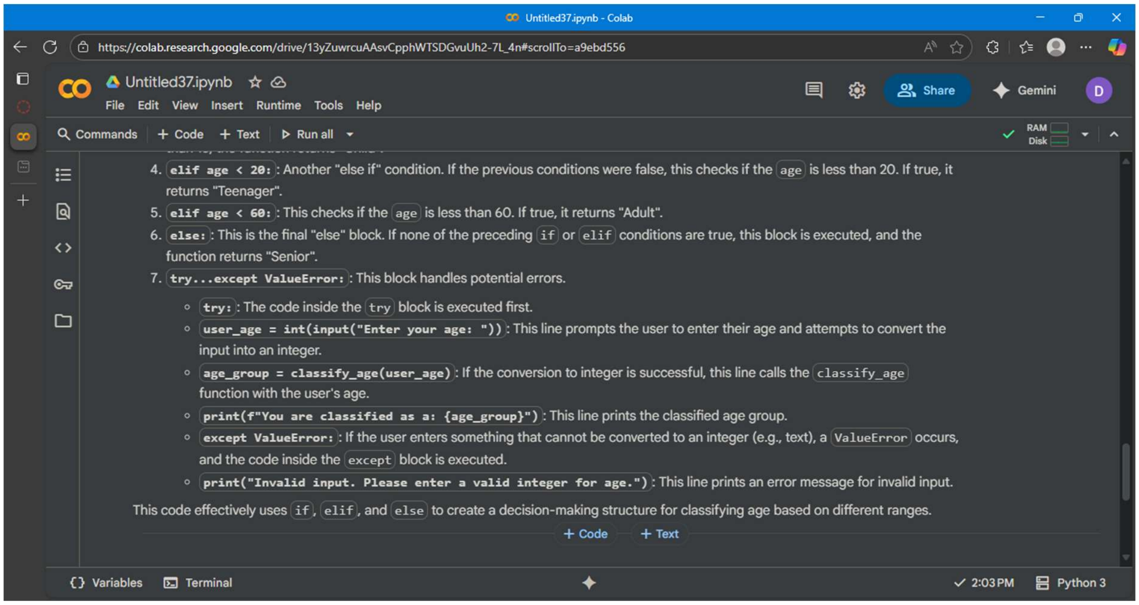

Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Share
Gemini
RAM Disk
[4]
9s
Variables
Terminal
2:03 PM
Python 3

```
try:
  user_age = int(input("Enter your age: "))
  age_group = classify_age(user_age)
  print(f"You are classified as a: {age_group}")
except ValueError:
  print("Invalid input. Please enter a valid integer for age.")
```

```
Enter your age: 34
You are classified as a: Adult
```

Explanation of the Code:

1. `def classify_age(age):`: This defines a function named `classify_age` that takes one argument, `age`.
2. `if age < 0:`: This is the first condition. If the `age` is less than 0, it means the input is invalid, and the function returns the string "Invalid age (age cannot be negative)".
3. `elif age < 13:`: This is an "else if" condition. If the previous `if` condition was false, this condition is checked. If the `age` is less than 13, the function returns "Child".
4. `elif age < 20:`: Another "else if" condition. If the previous conditions were false, this checks if the `age` is less than 20. If true, it returns "Teenager".
5. `elif age < 60:`: This checks if the `age` is less than 60. If true, it returns "Adult".
6. `else:`: This is the final "else" block. If none of the preceding `if` or `elif` conditions are true, this block is executed, and the function returns "Senior".


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Share
Gemini
RAM Disk
+ Code + Text
Variables
Terminal
2:03 PM
Python 3

4. `elif age < 20:`: Another "else if" condition. If the previous conditions were false, this checks if the `age` is less than 20. If true, it returns "Teenager".
5. `elif age < 60:`: This checks if the `age` is less than 60. If true, it returns "Adult".
6. `else:`: This is the final "else" block. If none of the preceding `if` or `elif` conditions are true, this block is executed, and the function returns "Senior".

7. `try...except ValueError:`: This block handles potential errors.
    - `try:`: The code inside the `try` block is executed first.
    - `user_age = int(input("Enter your age: "))`: This line prompts the user to enter their age and attempts to convert the input into an integer.
    - `age_group = classify_age(user_age)`: If the conversion to integer is successful, this line calls the `classify_age` function with the user's age.
    - `print(f"You are classified as a: {age_group}")`: This line prints the classified age group.
    - `except ValueError:`: If the user enters something that cannot be converted to an integer (e.g., text), a `ValueError` occurs, and the code inside the `except` block is executed.
    - `print("Invalid input. Please enter a valid integer for age.")`: This line prints an error message for invalid input.

This code effectively uses `if`, `elif`, and `else` to create a decision-making structure for classifying age based on different ranges.

This code defines a function classify_age that categorizes an input age. It uses if, elif, and else to check different age ranges. The try...except block handles potential invalid input from the user. It returns a string indicating the age group or an error message for negative/invalid ages.

Task Description#4 (For and While loops)

- 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

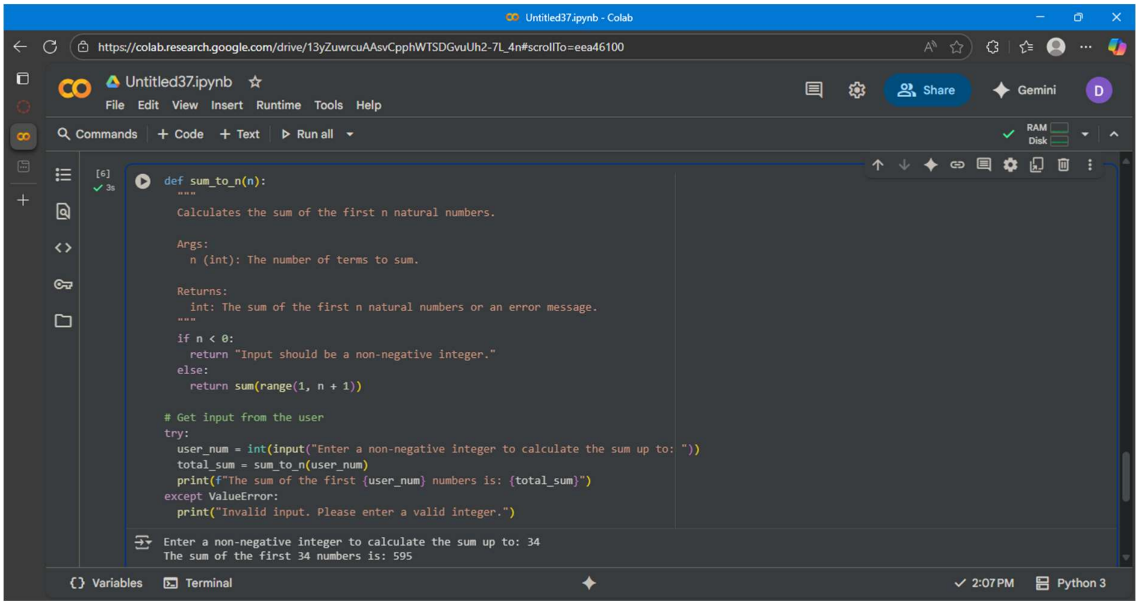
Expected Output#4

- Python code with explanation

Prompt:

Generate a sum_to_n() function to calculate sum of first n numbers with user given input

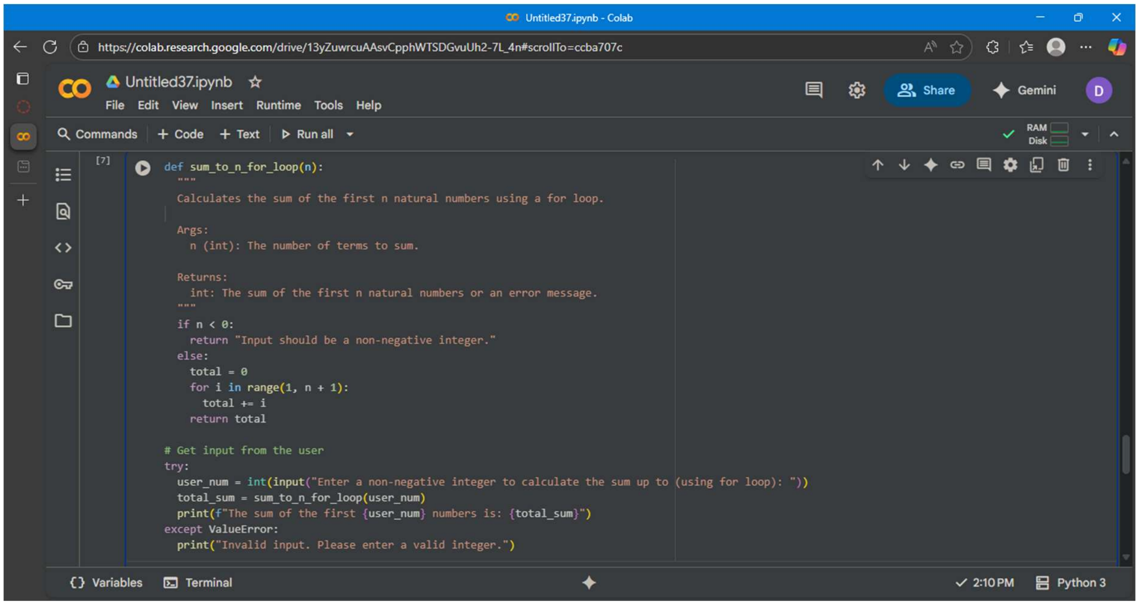
Screenshots:


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=eea46100
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Share
Gemini
Commands
+ Code
+ Text
Run all
RAM
Disk
[6]
3s
Variables
Terminal
2:07 PM
Python 3

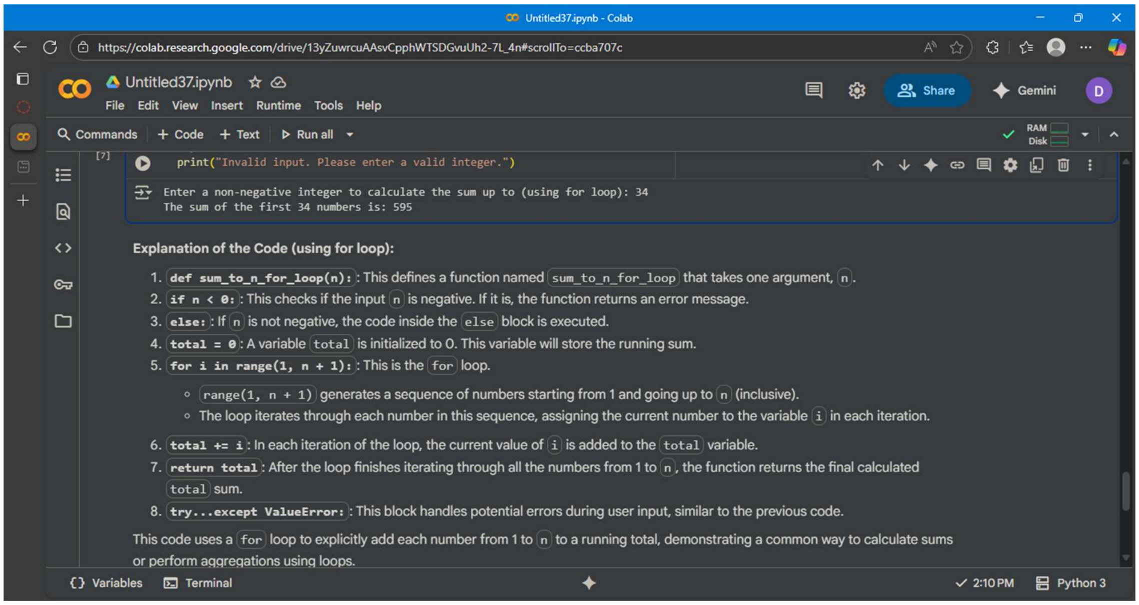
```
def sum_to_n(n):
  """
  Calculates the sum of the first n natural numbers.

  Args:
    n (int): The number of terms to sum.

  Returns:
    int: The sum of the first n natural numbers or an error message.
  """
  if n < 0:
    return "Input should be a non-negative integer."
  else:
    return sum(range(1, n + 1))

# Get input from the user
try:
  user_num = int(input("Enter a non-negative integer to calculate the sum up to: "))
  total_sum = sum_to_n(user_num)
  print(f"The sum of the first {user_num} numbers is: {total_sum}")
except ValueError:
  print("Invalid input. Please enter a valid integer.")
```

```
Enter a non-negative integer to calculate the sum up to: 34
The sum of the first 34 numbers is: 595
```

generate other controlled looping with explaination



```python
def sum_to_n_for_loop(n):
  """
  Calculates the sum of the first n natural numbers using a for loop.

  Args:
    n (int): The number of terms to sum.

  Returns:
    int: The sum of the first n natural numbers or an error message.
  """
  if n < 0:
    return "Input should be a non-negative integer."
  else:
    total = 0
    for i in range(1, n + 1):
      total += i
    return total

# Get input from the user
try:
  user_num = int(input("Enter a non-negative integer to calculate the sum up to (using for loop): "))
  total_sum = sum_to_n_for_loop(user_num)
  print(f"The sum of the first {user_num} numbers is: {total_sum}")
except ValueError:
  print("Invalid input. Please enter a valid integer.")
```



```python
  print("Invalid input. Please enter a valid integer.")
```

```
Enter a non-negative integer to calculate the sum up to (using for loop): 34
The sum of the first 34 numbers is: 595
```

Explanation of the Code (using for loop):

1. `def sum_to_n_for_loop(n):`: This defines a function named `sum_to_n_for_loop` that takes one argument, `n`.
2. `if n < 0:`: This checks if the input `n` is negative. If it is, the function returns an error message.
3. `else:`: If `n` is not negative, the code inside the `else` block is executed.
4. `total = 0`: A variable `total` is initialized to 0. This variable will store the running sum.
5. `for i in range(1, n + 1):`: This is the `for` loop.
    - `range(1, n + 1)` generates a sequence of numbers starting from 1 and going up to `n` (inclusive).
    - The loop iterates through each number in this sequence, assigning the current number to the variable `i` in each iteration.
6. `total += i`: In each iteration of the loop, the current value of `i` is added to the `total` variable.
7. `return total`: After the loop finishes iterating through all the numbers from 1 to `n`, the function returns the final calculated `total` sum.
8. `try...except ValueError:`: This block handles potential errors during user input, similar to the previous code.

This code uses a `for` loop to explicitly add each number from 1 to `n` to a running total, demonstrating a common way to calculate sums or perform aggregations using loops.

Code analysis:

This function calculates the sum of the first n non-negative integers. It initializes a total to zero. A for loop iterates from

1 up to n. In each iteration, the current number is added to total. Finally, the accumulated total is returned

Task Description#5 (Class)

- **Use AI to build a BankAccount class with deposit, withdraw, and balance methods.**
- **Analyze the generated code**
- **Add comments and explain code**

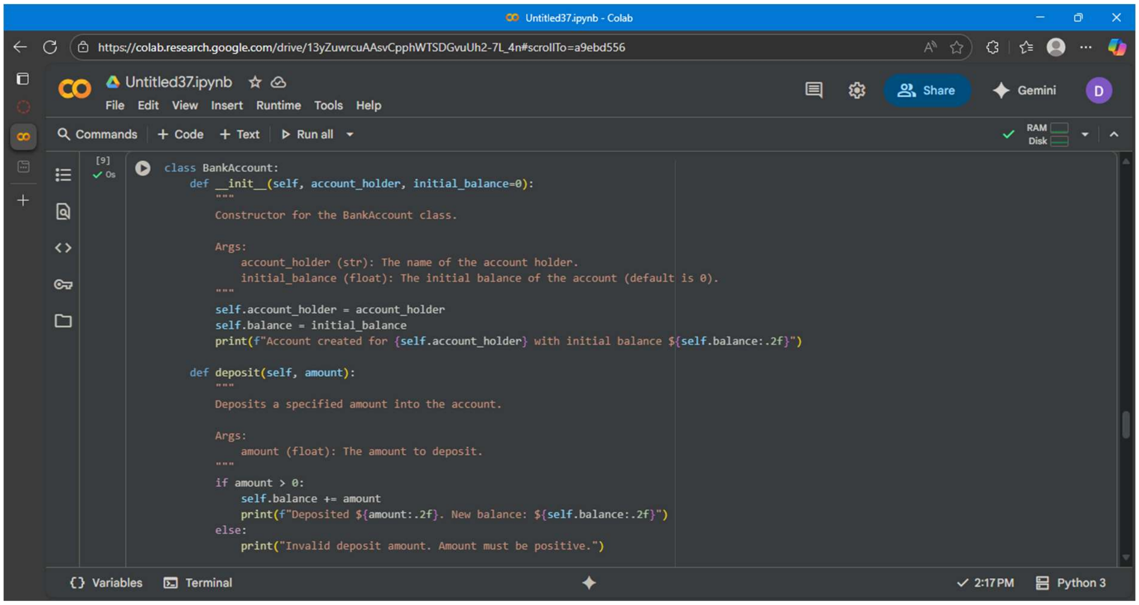
Expected Output#5

- **Python code with explanation**

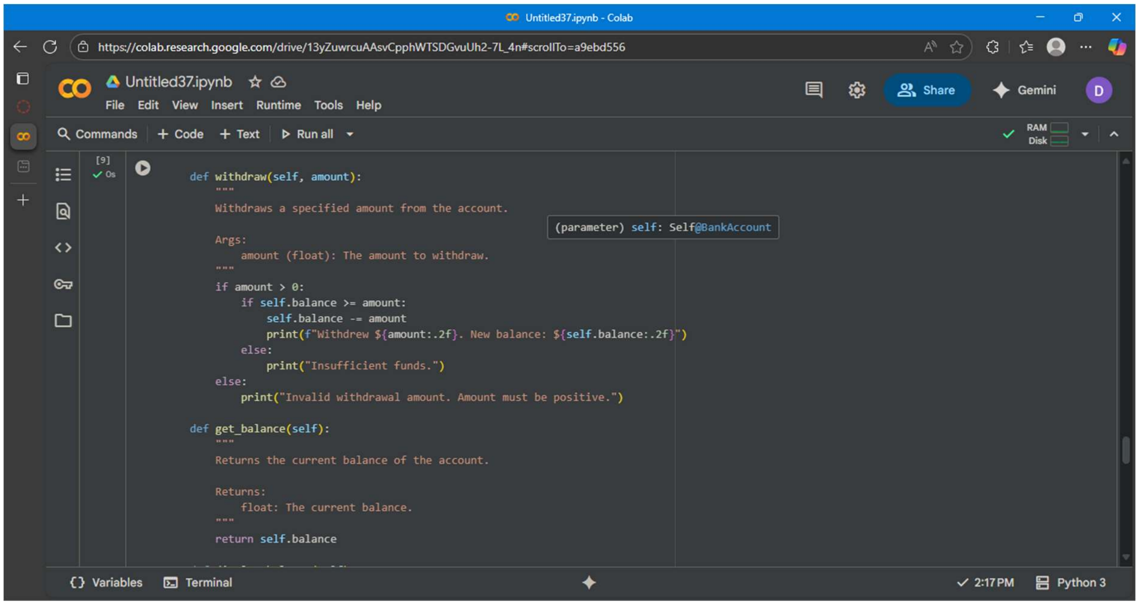
Prompt:

generate a python code for building a BankAccount class with deposit, withdraw, and balance methods with comments and explainations

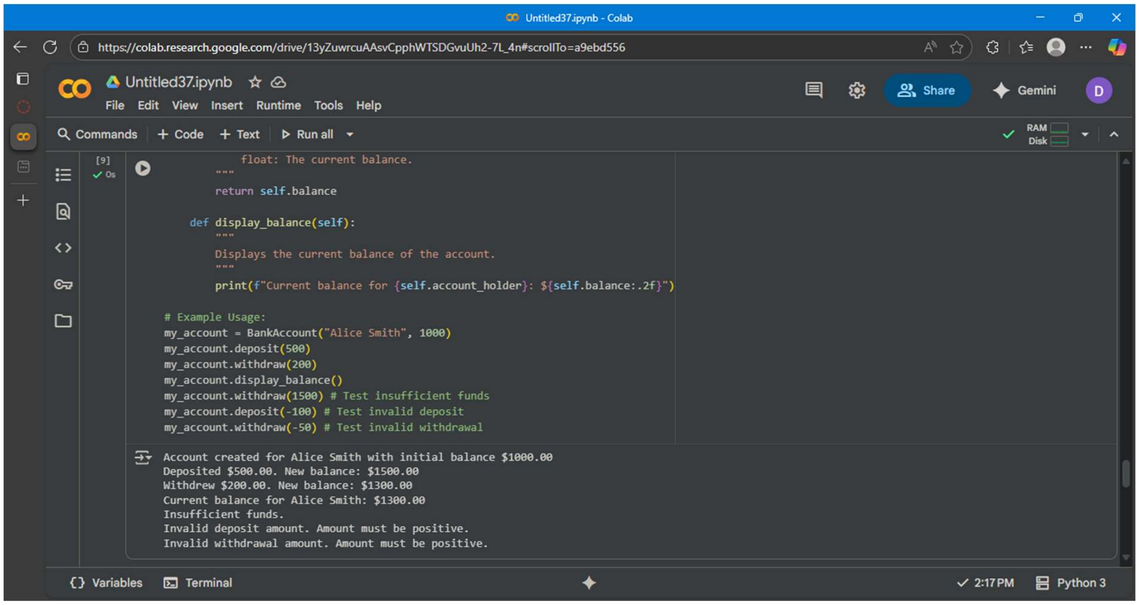
screenshots:


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Share
Gemini
RAM
Disk
[9]
0s
Variables
Terminal
2:17 PM
Python 3

```python
class BankAccount:
    def __init__(self, account_holder, initial_balance=0):
        """
        Constructor for the BankAccount class.

        Args:
            account_holder (str): The name of the account holder.
            initial_balance (float): The initial balance of the account (default is 0).
        """
        self.account_holder = account_holder
        self.balance = initial_balance
        print(f"Account created for {self.account_holder} with initial balance ${self.balance:.2f}")

    def deposit(self, amount):
        """
        Deposits a specified amount into the account.

        Args:
            amount (float): The amount to deposit.
        """
        if amount > 0:
            self.balance += amount
            print(f"Deposited ${amount:.2f}. New balance: ${self.balance:.2f}")
        else:
            print("Invalid deposit amount. Amount must be positive.")
```


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands + Code + Text Run all
Share
Gemini
RAM
Disk
[9]
0s
(parameter) self: Self@BankAccount
Variables
Terminal
2:17 PM
Python 3

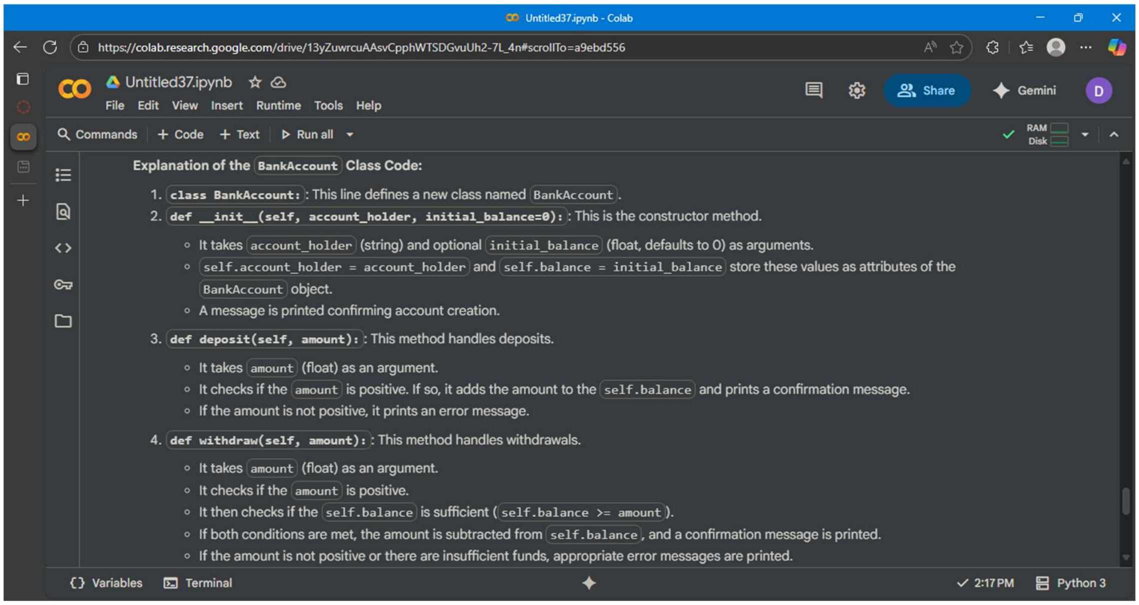
```python

    def withdraw(self, amount):
        """
        Withdraws a specified amount from the account.

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

    def get_balance(self):
        """
        Returns the current balance of the account.

        Returns:
            float: The current balance.
        """
        return self.balance
```


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands
+ Code
+ Text
Run all
Share
Gemini
RAM
Disk
[9]
0s
Variables
Terminal
2:17 PM
Python 3

```
            float: The current balance.
        """
        return self.balance

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

# Example Usage:
my_account = BankAccount("Alice Smith", 1000)
my_account.deposit(500)
my_account.withdraw(200)
my_account.display_balance()
my_account.withdraw(1500) # Test insufficient funds
my_account.deposit(-100) # Test invalid deposit
my_account.withdraw(-50) # Test invalid withdrawal
```

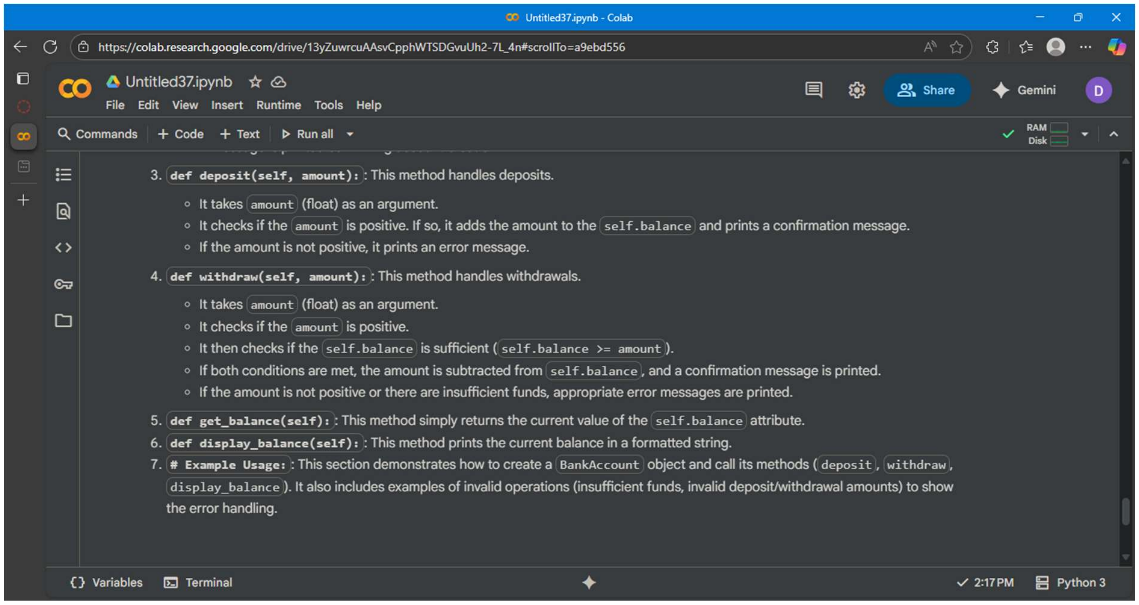
```
Account created for Alice Smith with initial balance $1000.00
Deposited $500.00. New balance: $1500.00
Withdrew $200.00. New balance: $1300.00
Current balance for Alice Smith: $1300.00
Insufficient funds.
Invalid deposit amount. Amount must be positive.
Invalid withdrawal amount. Amount must be positive.
```

Explaination:


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Commands
+ Code
+ Text
Run all
Share
Gemini
RAM
Disk
Variables
Terminal
2:17 PM
Python 3

Explanation of the `BankAccount` Class Code:

1. `class BankAccount:`: This line defines a new class named `BankAccount`.
2. `def __init__(self, account_holder, initial_balance=0):`: This is the constructor method.
   - It takes `account_holder` (string) and optional `initial_balance` (float, defaults to 0) as arguments.
   - `self.account_holder = account_holder` and `self.balance = initial_balance` store these values as attributes of the `BankAccount` object.
   - A message is printed confirming account creation.
3. `def deposit(self, amount):`: This method handles deposits.
   - It takes `amount` (float) as an argument.
   - It checks if the `amount` is positive. If so, it adds the amount to the `self.balance` and prints a confirmation message.
   - If the amount is not positive, it prints an error message.
4. `def withdraw(self, amount):`: This method handles withdrawals.
   - It takes `amount` (float) as an argument.
   - It checks if the `amount` is positive.
   - It then checks if the `self.balance` is sufficient (`self.balance >= amount`).
   - If both conditions are met, the amount is subtracted from `self.balance`, and a confirmation message is printed.
   - If the amount is not positive or there are insufficient funds, appropriate error messages are printed.


Untitled37.ipynb - Colab
https://colab.research.google.com/drive/13yZuwrcuAAsvCpphWTSDGvuUh2-7L_4n#scrollTo=a9ebd556
Untitled37.ipynb
File Edit View Insert Runtime Tools Help
Share
Gemini
Commands
+ Code
+ Text
Run all
RAM
Disk
Variables
Terminal
2:17 PM
Python 3

3. **`def deposit(self, amount):`**: This method handles deposits.
    - It takes `amount` (float) as an argument.
    - It checks if the `amount` is positive. If so, it adds the amount to the `self.balance` and prints a confirmation message.
    - If the amount is not positive, it prints an error message.
4. **`def withdraw(self, amount):`**: This method handles withdrawals.
    - It takes `amount` (float) as an argument.
    - It checks if the `amount` is positive.
    - It then checks if the `self.balance` is sufficient (`self.balance >= amount`).
    - If both conditions are met, the amount is subtracted from `self.balance`, and a confirmation message is printed.
    - If the amount is not positive or there are insufficient funds, appropriate error messages are printed.
5. **`def get_balance(self):`**: This method simply returns the current value of the `self.balance` attribute.
6. **`def display_balance(self):`**: This method prints the current balance in a formatted string.
7. **`# Example Usage:`**: This section demonstrates how to create a `BankAccount` object and call its methods (`deposit`, `withdraw`, `display_balance`). It also includes examples of invalid operations (insufficient funds, invalid deposit/withdrawal amounts) to show the error handling.