Assignment 6.3 Ai Assisted Coding

Htno:2303a51305

Btno:05

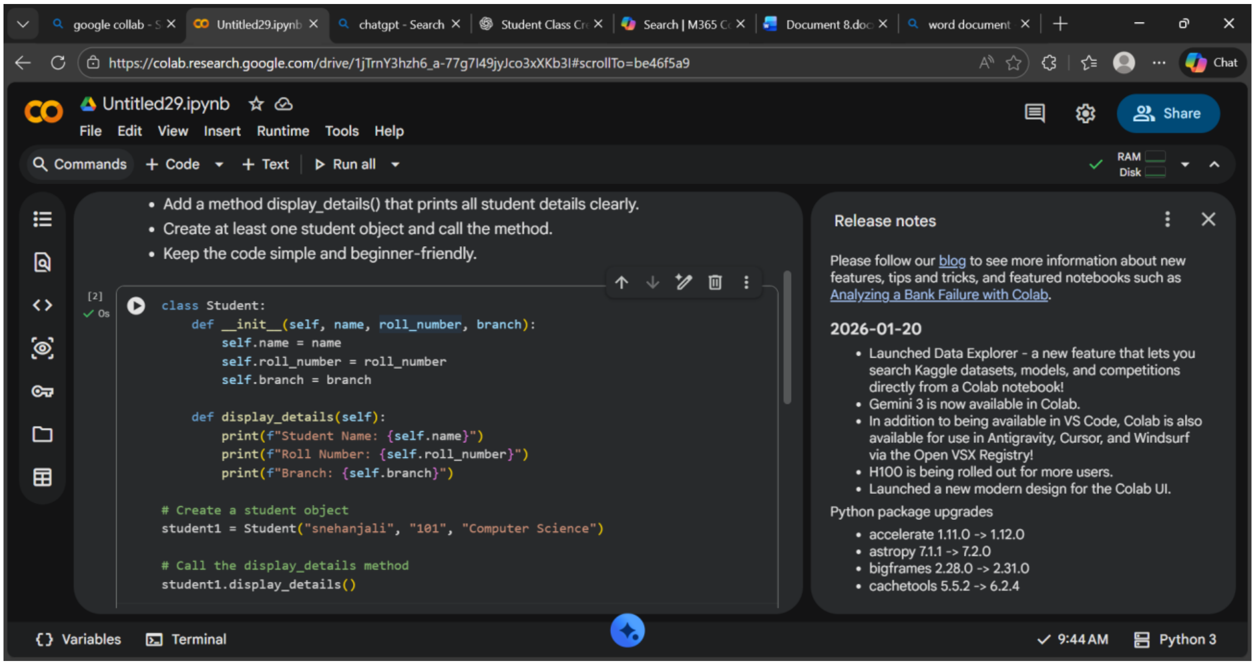
Task 1: Classes (Student Class).

Prompt: Write a Python program to create a Student class.

Requirements:

- The class should have attributes: name, roll_number, and branch.
- Use a constructor (**init**) to initialize the values.
- Add a method display_details() that prints all student details clearly.
- Create at least one student object and call the method.
- Keep the code simple and beginner-friendly.

Input:



- Add a method display_details() that prints all student details clearly.
- Create at least one student object and call the method.
- Keep the code simple and beginner-friendly.

```python
class Student:
    def __init__(self, name, roll_number, branch):
        self.name = name
        self.roll_number = roll_number
        self.branch = branch

    def display_details(self):
        print(f"Student Name: {self.name}")
        print(f"Roll Number: {self.roll_number}")
        print(f"Branch: {self.branch}")

# Create a student object
student1 = Student("snehanjali", "101", "Computer Science")

# Call the display_details method
student1.display_details()
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

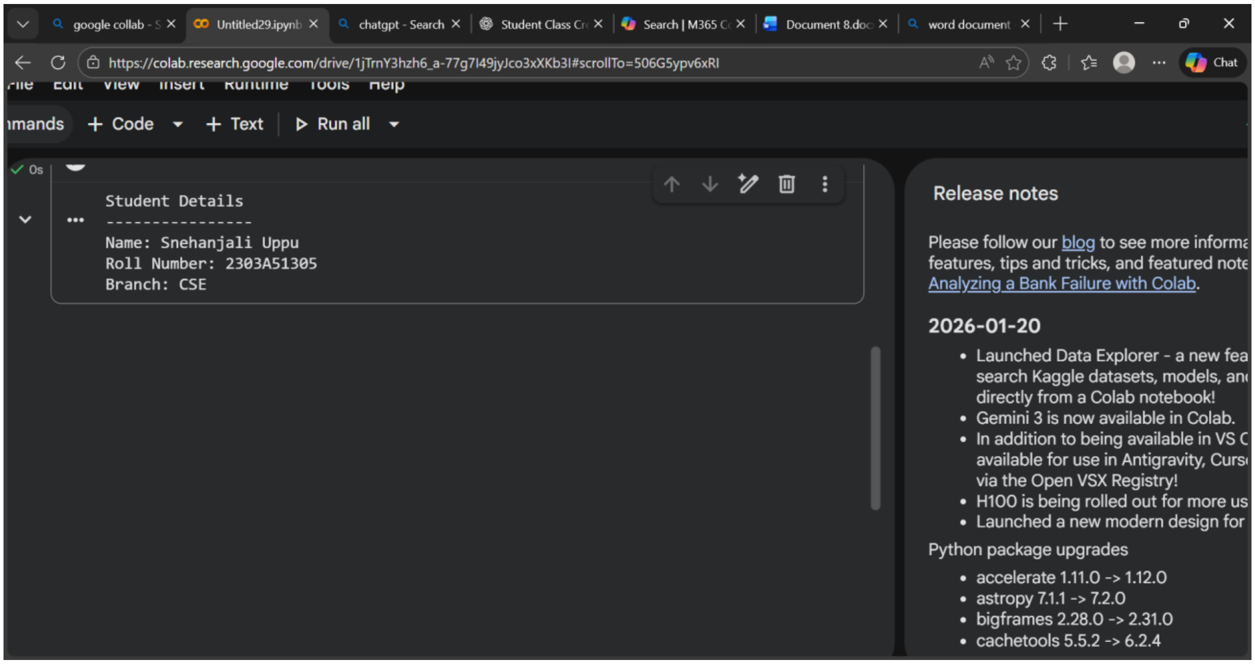
2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Output:



```
Student Details
---------------
Name: Snehanjali Uppu
Roll Number: 2303A51305
Branch: CSE
```

Release notes

Please follow our blog to see more informa features, tips and tricks, and featured note Analyzing a Bank Failure with Colab.

2026-01-20

- Launched Data Explorer - a new fea search Kaggle datasets, models, an directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS C available for use in Antigravity, Curs via the Open VSX Registry!
- H100 is being rolled out for more us
- Launched a new modern design for

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Explanation: The program defines a `Student` class with attributes (name, roll number, branch) initialized using a constructor.

The `display_details()` method prints the student information, showing basic OOP concepts like class, object, and methods.

Task 2:Loops of a number.

Prompt: Write a Python function that prints the first 10 multiples of a given number.

Requirements:

- Use a loop structure.

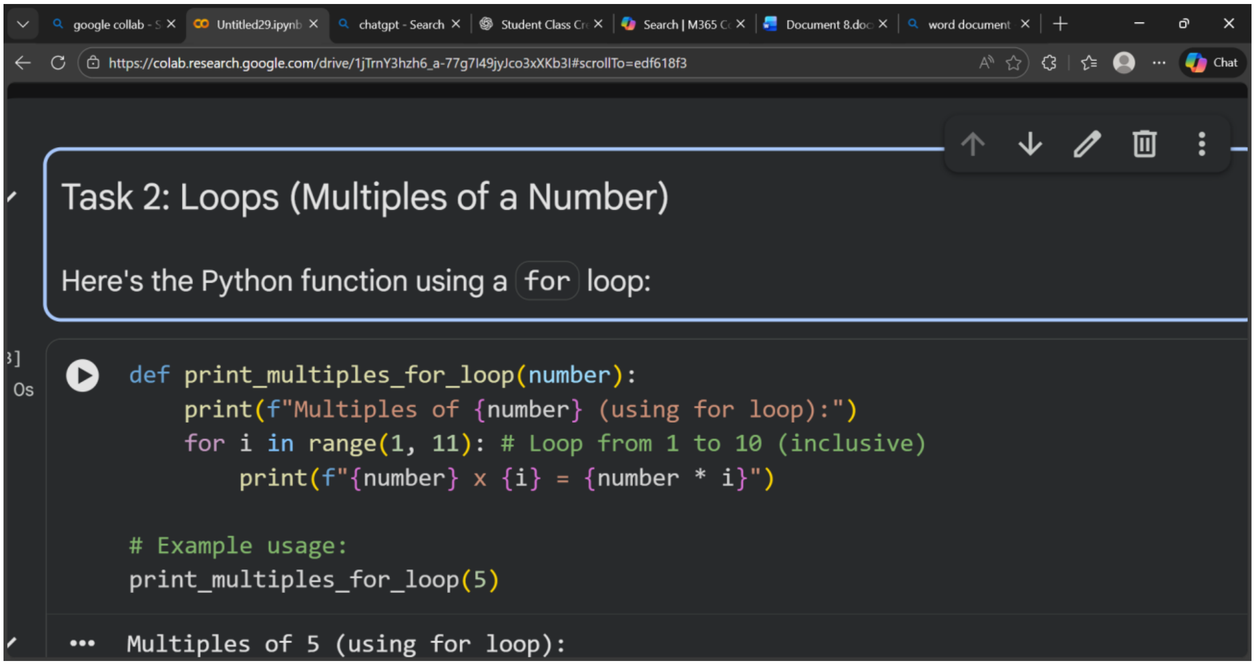
- The number should be passed as a parameter.

- Print the multiples clearly.

- Keep the code simple and beginner-friendly.

Then write another version of the same program using a different loop (while loop instead of for loop).

Input:



Task 2: Loops (Multiples of a Number)

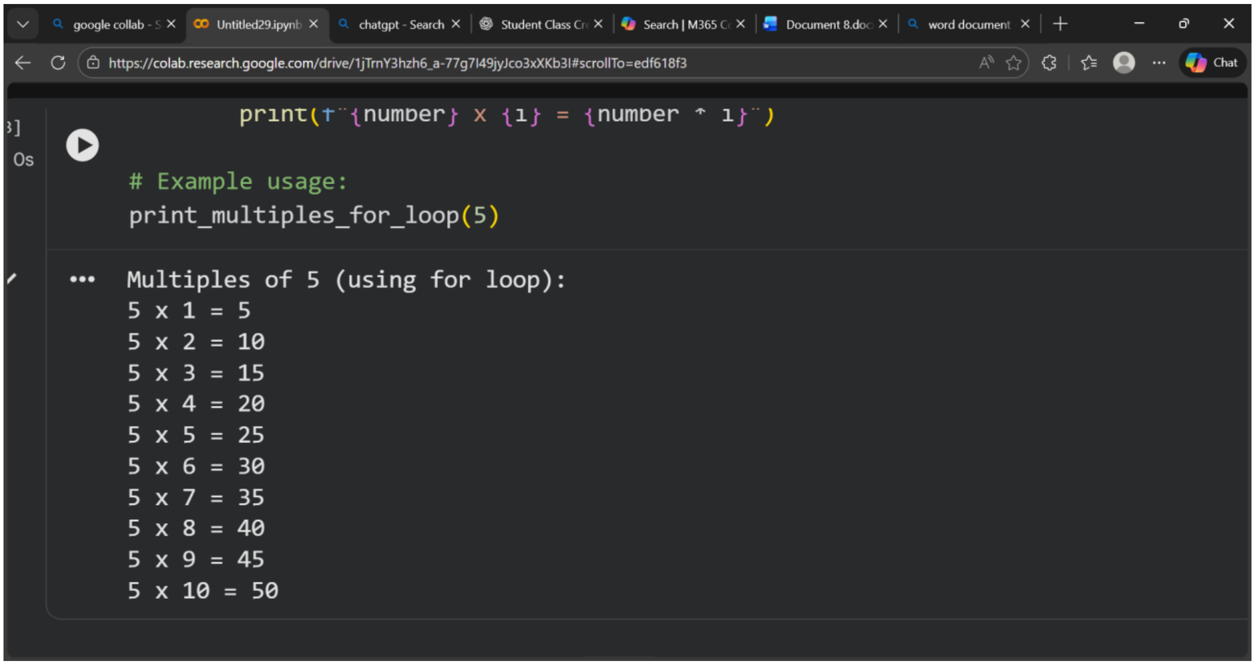
Here's the Python function using a `for` loop:

```
def print_multiples_for_loop(number):
    print(f"Multiples of {number} (using for loop):")
    for i in range(1, 11): # Loop from 1 to 10 (inclusive)
        print(f"{number} x {i} = {number * i}")

# Example usage:
print_multiples_for_loop(5)
```

```
Multiples of 5 (using for loop):
```

Output:

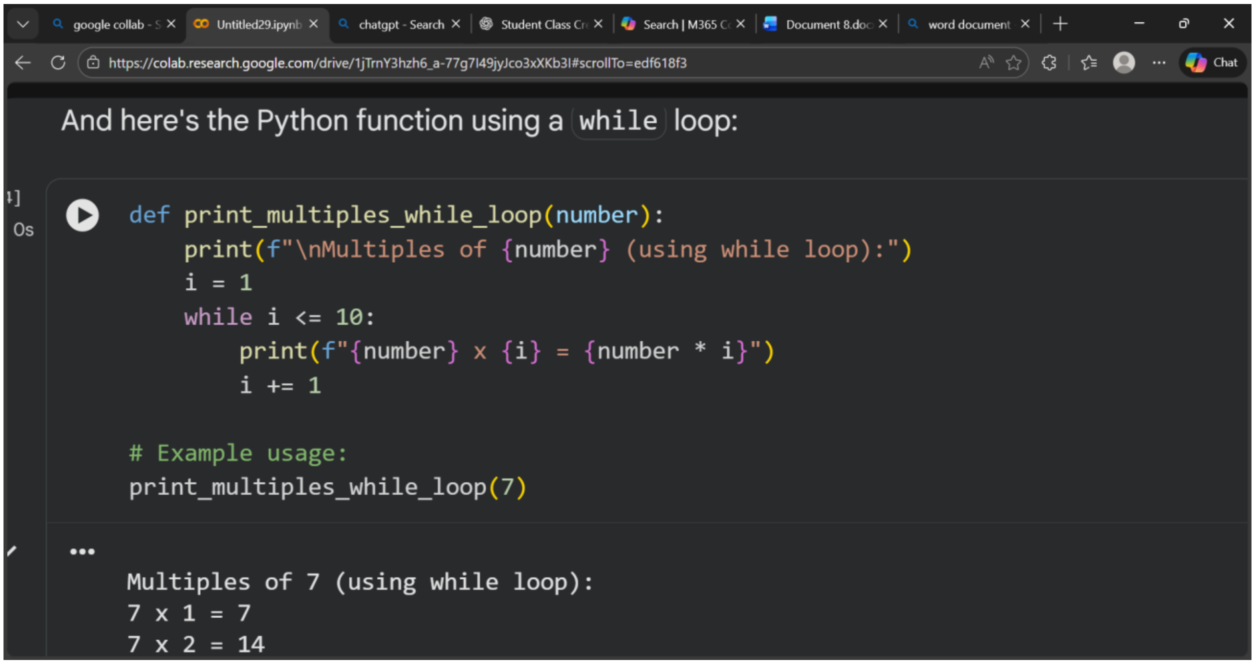


```
        print(f"{number} x {i} = {number * i}")

# Example usage:
print_multiples_for_loop(5)
```

```
Multiples of 5 (using for loop):
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

2)Input:



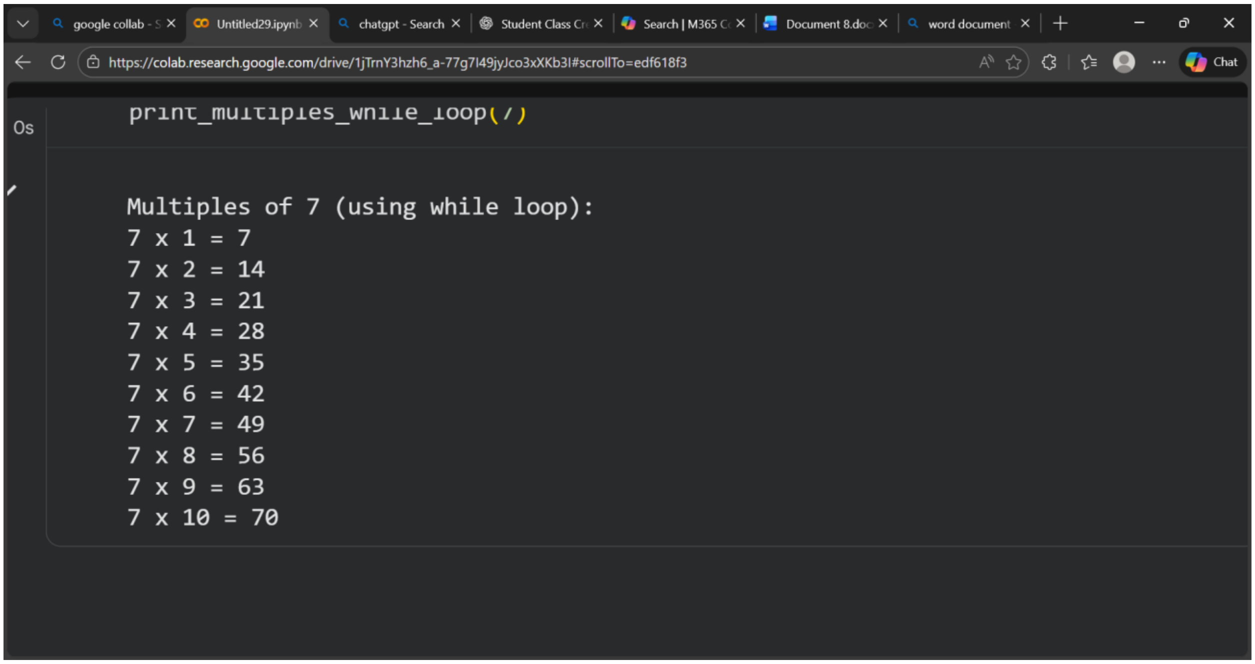
And here's the Python function using a `while` loop:

```
def print_multiples_while_loop(number):
    print(f"\nMultiples of {number} (using while loop):")
    i = 1
    while i <= 10:
        print(f"{number} x {i} = {number * i}")
        i += 1

# Example usage:
print_multiples_while_loop(7)
```

```
Multiples of 7 (using while loop):
7 x 1 = 7
7 x 2 = 14
```

2)Output:



```
print_multiples_while_loop(7)
```

```
Multiples of 7 (using while loop):
7 x 1 = 7
7 x 2 = 14
7 x 3 = 21
7 x 4 = 28
7 x 5 = 35
7 x 6 = 42
7 x 7 = 49
7 x 8 = 56
7 x 9 = 63
7 x 10 = 70
```

Expalantion: A loop is used to repeat an action 10 times and calculate multiples of a number using multiplication.

`for` loop is best for fixed iterations, while `while` loop gives more control using a condition.

Task 3: Conditional Statements (Age Classification)

Prompt: Write a Python function to classify a person based on age.

Requirements:

- Use nested if-elif-else statements.

- Age groups:

Child: 0–12

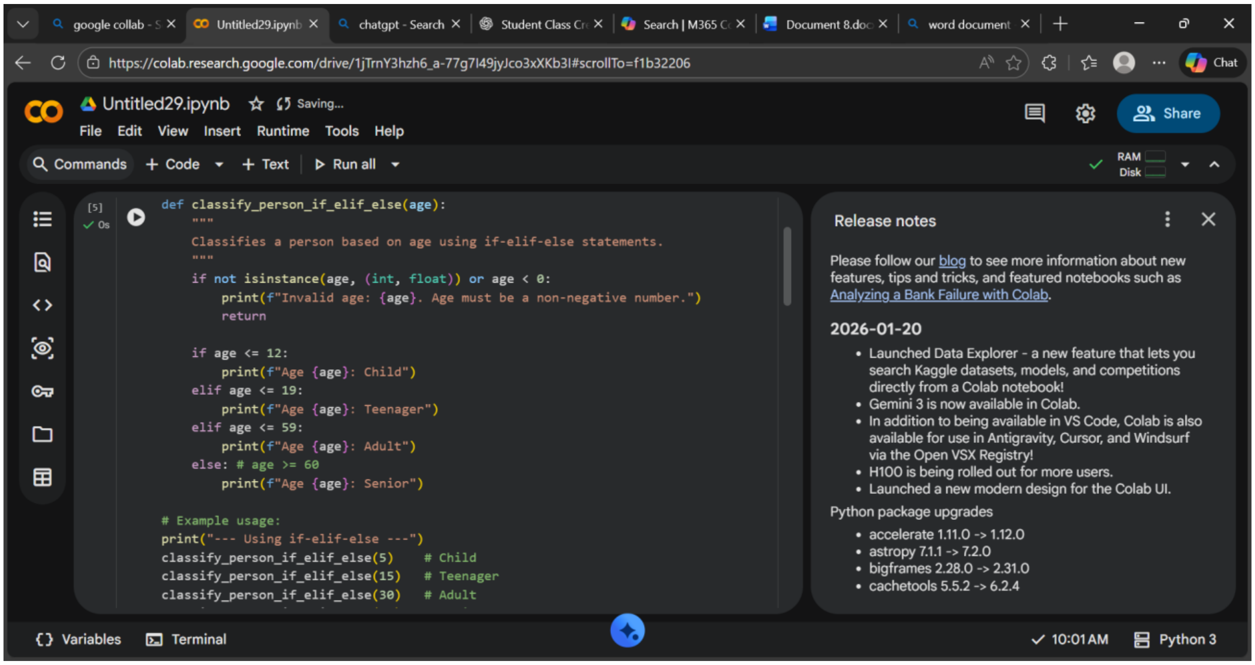
Teenager: 13–19

Adult: 20–59

Senior: 60 and above

The function should take age as input and print the categoryThen generate another version using an alternative approach (simplified conditions or dictionary-based logic).Keep the code beginner-friendly.

Input:using if else statements



```
def classify_person_if_elif_else(age):
    """
    Classifies a person based on age using if-elif-else statements.
    """
    if not isinstance(age, (int, float)) or age < 0:
        print(f"Invalid age: {age}. Age must be a non-negative number.")
        return

    if age <= 12:
        print(f"Age {age}: Child")
    elif age <= 19:
        print(f"Age {age}: Teenager")
    elif age <= 59:
        print(f"Age {age}: Adult")
    else: # age >= 60
        print(f"Age {age}: Senior")

# Example usage:
print("--- Using if-elif-else ---")
classify_person_if_elif_else(5)    # Child
classify_person_if_elif_else(15)   # Teenager
classify_person_if_elif_else(30)   # Adult
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

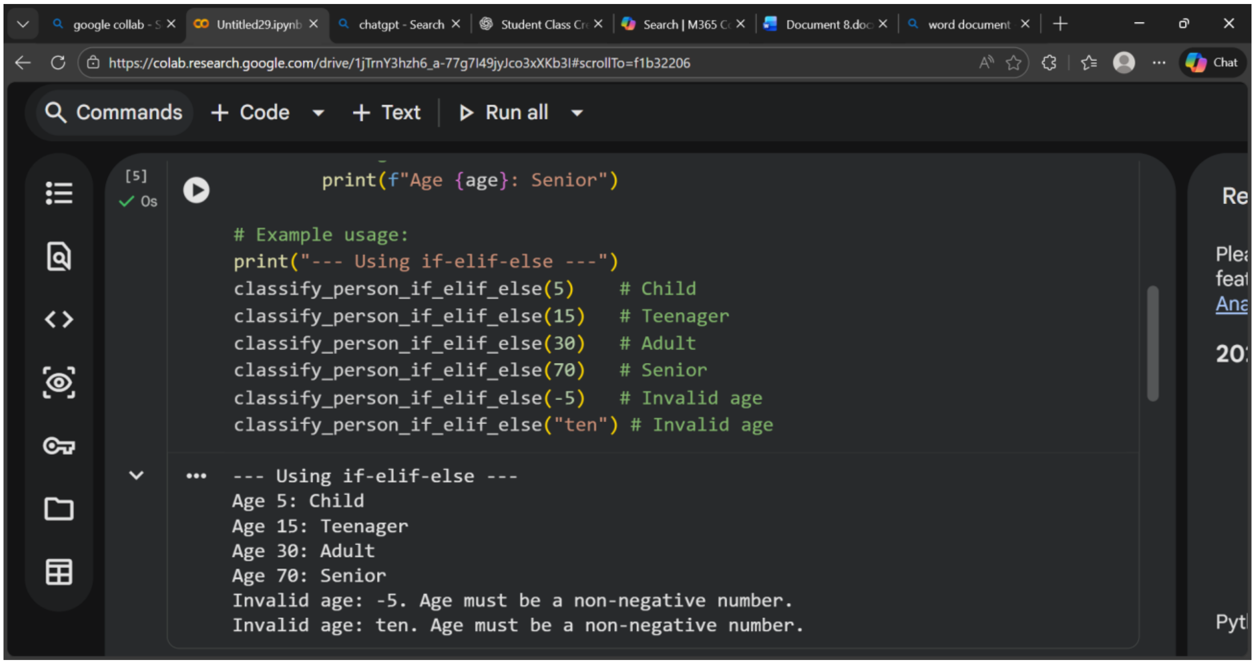
2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Output:

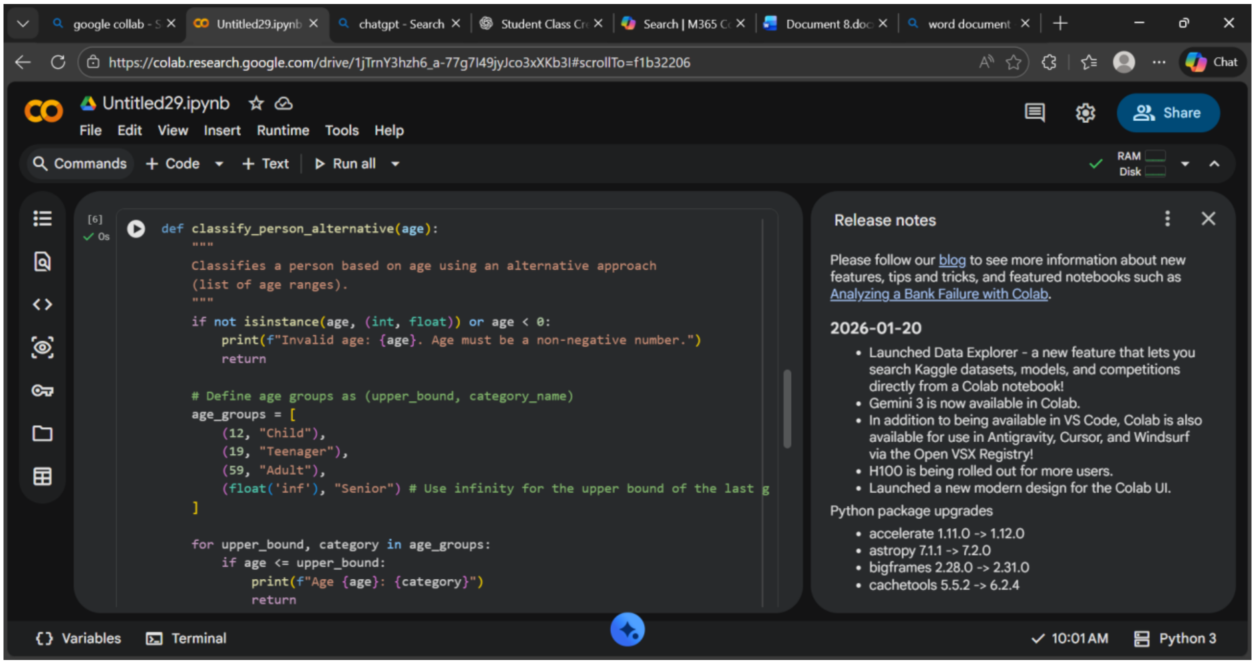


```
        print(f"Age {age}: Senior")

# Example usage:
print("--- Using if-elif-else ---")
classify_person_if_elif_else(5)    # Child
classify_person_if_elif_else(15)   # Teenager
classify_person_if_elif_else(30)   # Adult
classify_person_if_elif_else(70)   # Senior
classify_person_if_elif_else(-5)   # Invalid age
classify_person_if_elif_else("ten") # Invalid age
```

```
--- Using if-elif-else ---
Age 5: Child
Age 15: Teenager
Age 30: Adult
Age 70: Senior
Invalid age: -5. Age must be a non-negative number.
Invalid age: ten. Age must be a non-negative number.
```

2)input:using alternative methods



```
def classify_person_alternative(age):
    """
    Classifies a person based on age using an alternative approach
    (list of age ranges).
    """
    if not isinstance(age, (int, float)) or age < 0:
        print(f"Invalid age: {age}. Age must be a non-negative number.")
        return

    # Define age groups as (upper_bound, category_name)
    age_groups = [
        (12, "Child"),
        (19, "Teenager"),
        (59, "Adult"),
        (float('inf'), "Senior") # Use infinity for the upper bound of the last g
    ]

    for upper_bound, category in age_groups:
        if age <= upper_bound:
            print(f"Age {age}: {category}")
            return
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

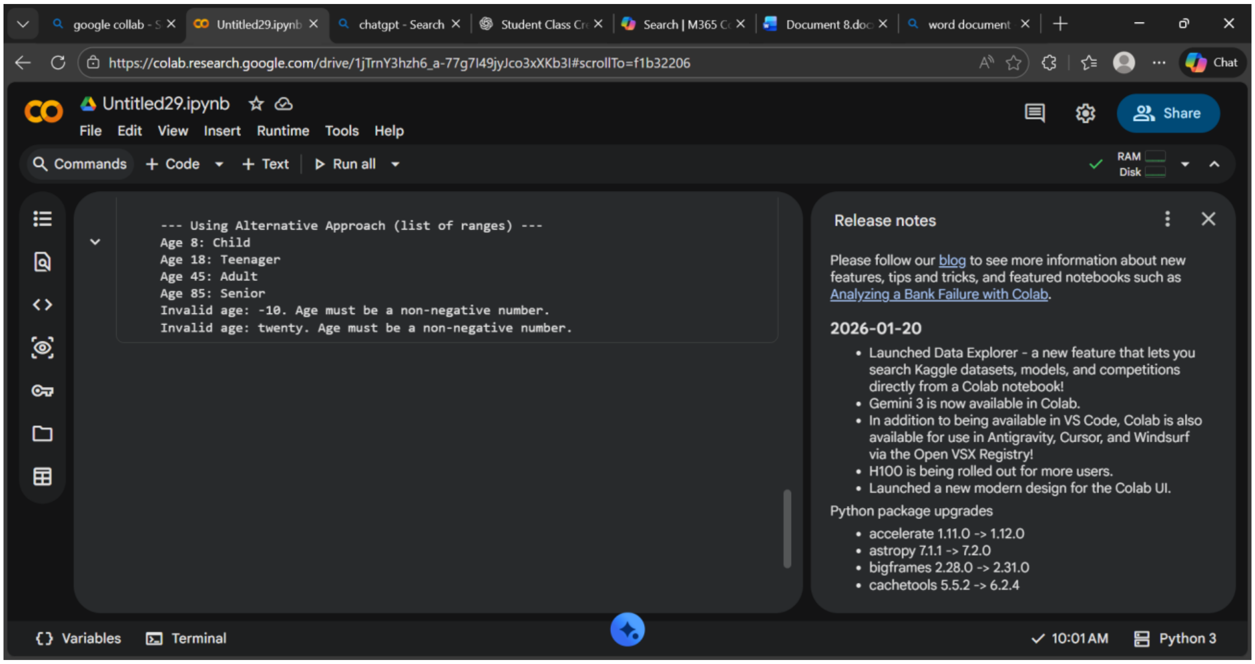
2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Output:



```
--- Using Alternative Approach (list of ranges) ---
Age 8: Child
Age 18: Teenager
Age 45: Adult
Age 85: Senior
Invalid age: -10. Age must be a non-negative number.
Invalid age: twenty. Age must be a non-negative number.
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Explanation: Conditional statements (`if-elif-else`) check age ranges and assign a category like child, teenager, adult, or senior.

The logic works top-to-bottom, and alternative methods like dictionary mapping make the system more flexible.

Task 4: For and While Loops (Sum of First n Numbers)

Prompt: Write a Python function sum_to_n(n) to calculate the sum of the first n natural numbers.

Requirements:

- Use a for loop.

- Keep the code simple.

- Show example function call and output.

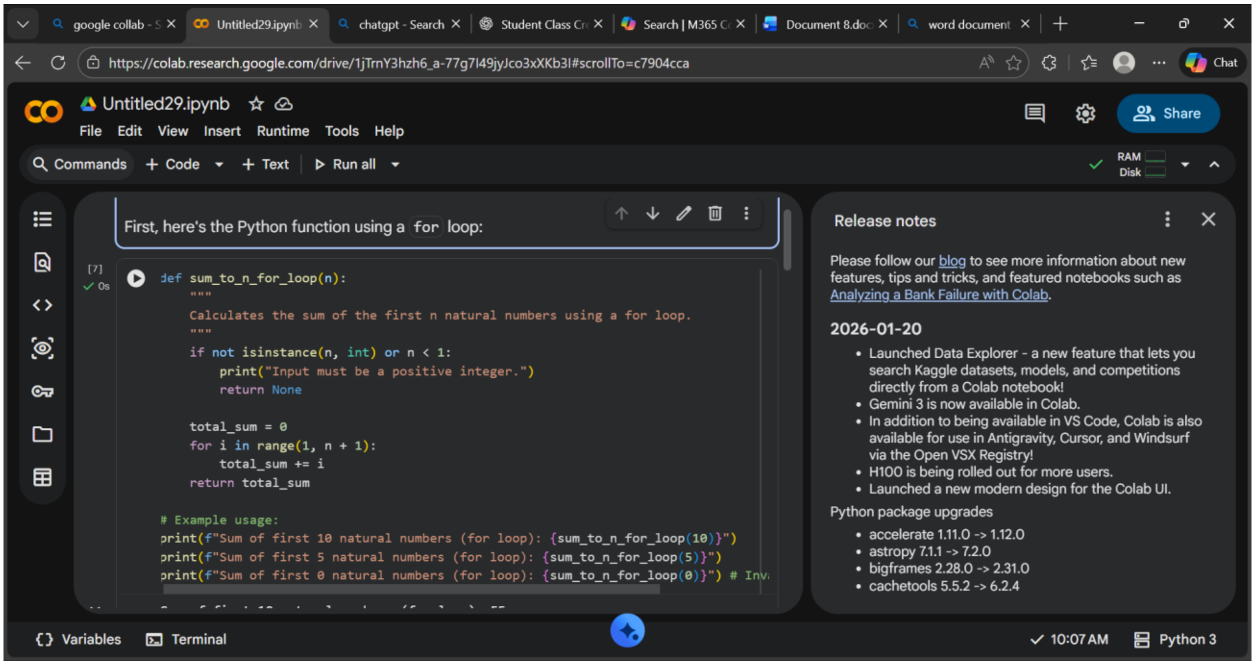
Then provide an alternative implementation using:

1) a while loop

2) a mathematical formula

Explain the differences briefly.

1 Input:



First, here's the Python function using a `for` loop:

[7] ✓ 0s

```
def sum_to_n_for_loop(n):
    """
    Calculates the sum of the first n natural numbers using a for loop.
    """
    if not isinstance(n, int) or n < 1:
        print("Input must be a positive integer.")
        return None

    total_sum = 0
    for i in range(1, n + 1):
        total_sum += i
    return total_sum

# Example usage:
print(f"Sum of first 10 natural numbers (for loop): {sum_to_n_for_loop(10)}")
print(f"Sum of first 5 natural numbers (for loop): {sum_to_n_for_loop(5)}")
print(f"Sum of first 0 natural numbers (for loop): {sum_to_n_for_loop(0)}") # Inv
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

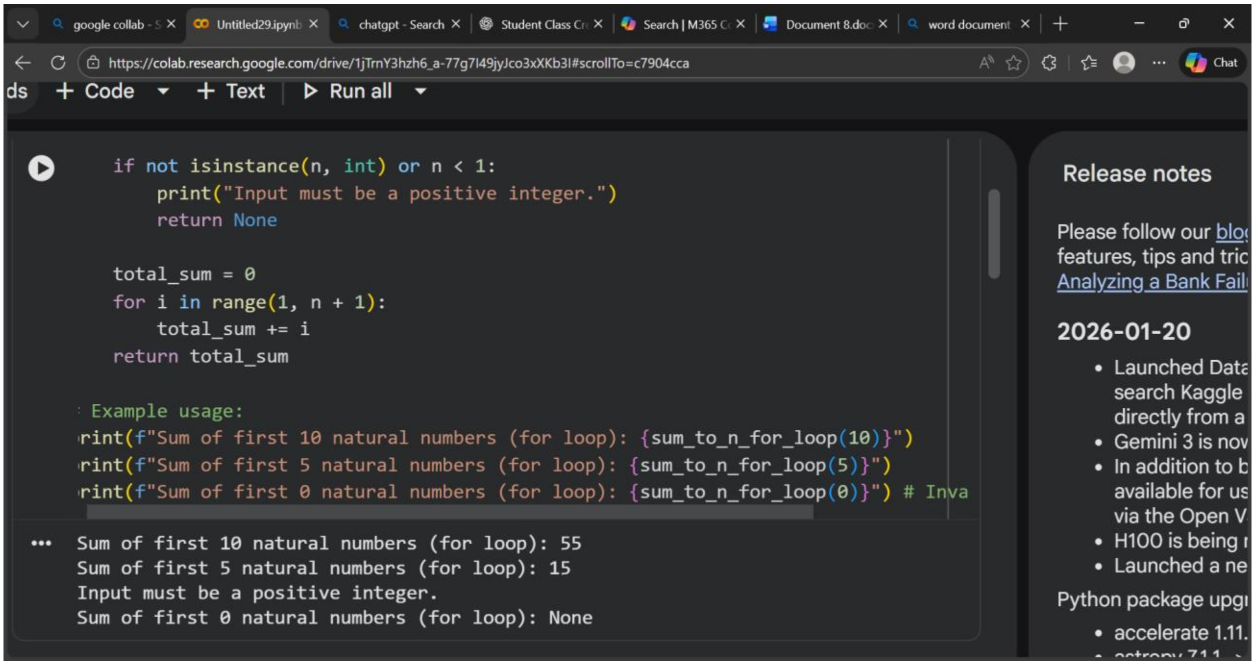
2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Output:



```
    if not isinstance(n, int) or n < 1:
        print("Input must be a positive integer.")
        return None

    total_sum = 0
    for i in range(1, n + 1):
        total_sum += i
    return total_sum

 Example usage:
rint(f"Sum of first 10 natural numbers (for loop): {sum_to_n_for_loop(10)}")
rint(f"Sum of first 5 natural numbers (for loop): {sum_to_n_for_loop(5)}")
rint(f"Sum of first 0 natural numbers (for loop): {sum_to_n_for_loop(0)}") # Inva
```

```
Sum of first 10 natural numbers (for loop): 55
Sum of first 5 natural numbers (for loop): 15
Input must be a positive integer.
Sum of first 0 natural numbers (for loop): None
```

Release notes

Please follow our blog
features, tips and tric
Analyzing a Bank Fail

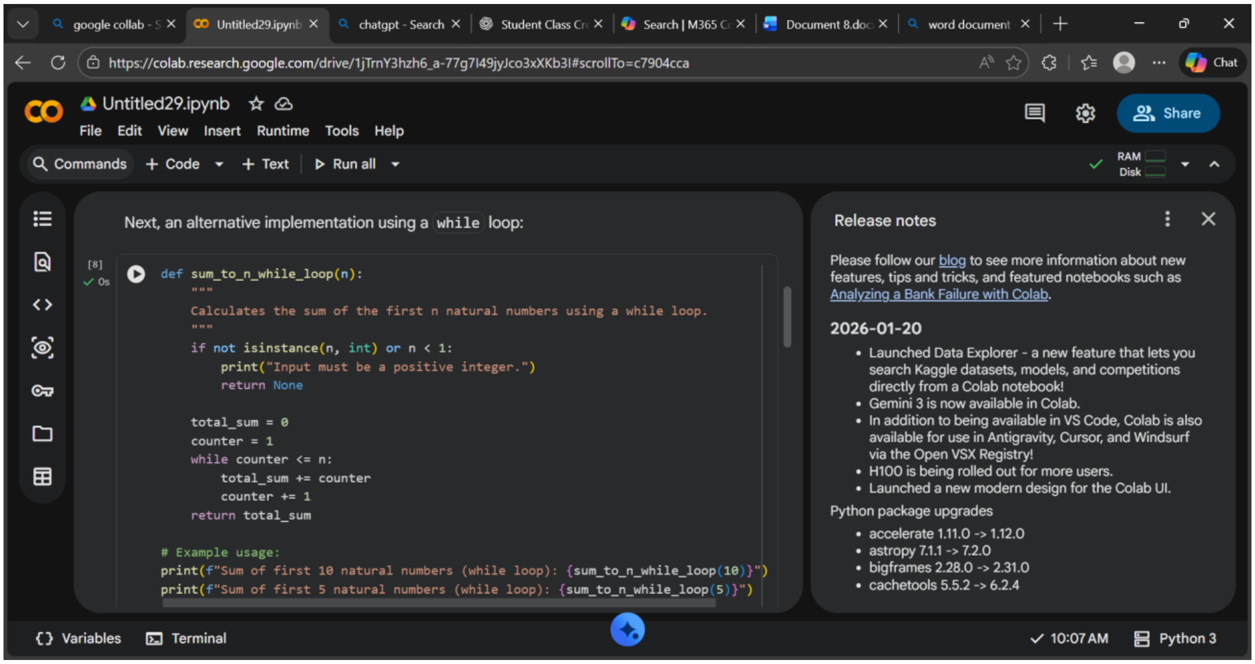
2026-01-20

- Launched Data
search Kaggle
directly from a
- Gemini 3 is nov
- In addition to b
available for us
via the Open V
- H100 is being r
- Launched a ne

Python package upgr

- accelerate 1.11.

2) input:



Next, an alternative implementation using a `while` loop:

```
[8]
def sum_to_n_while_loop(n):
    """
    Calculates the sum of the first n natural numbers using a while loop.
    """
    if not isinstance(n, int) or n < 1:
        print("Input must be a positive integer.")
        return None

    total_sum = 0
    counter = 1
    while counter <= n:
        total_sum += counter
        counter += 1
    return total_sum

# Example usage:
print(f"Sum of first 10 natural numbers (while loop): {sum_to_n_while_loop(10)}")
print(f"Sum of first 5 natural numbers (while loop): {sum_to_n_while_loop(5)}")
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

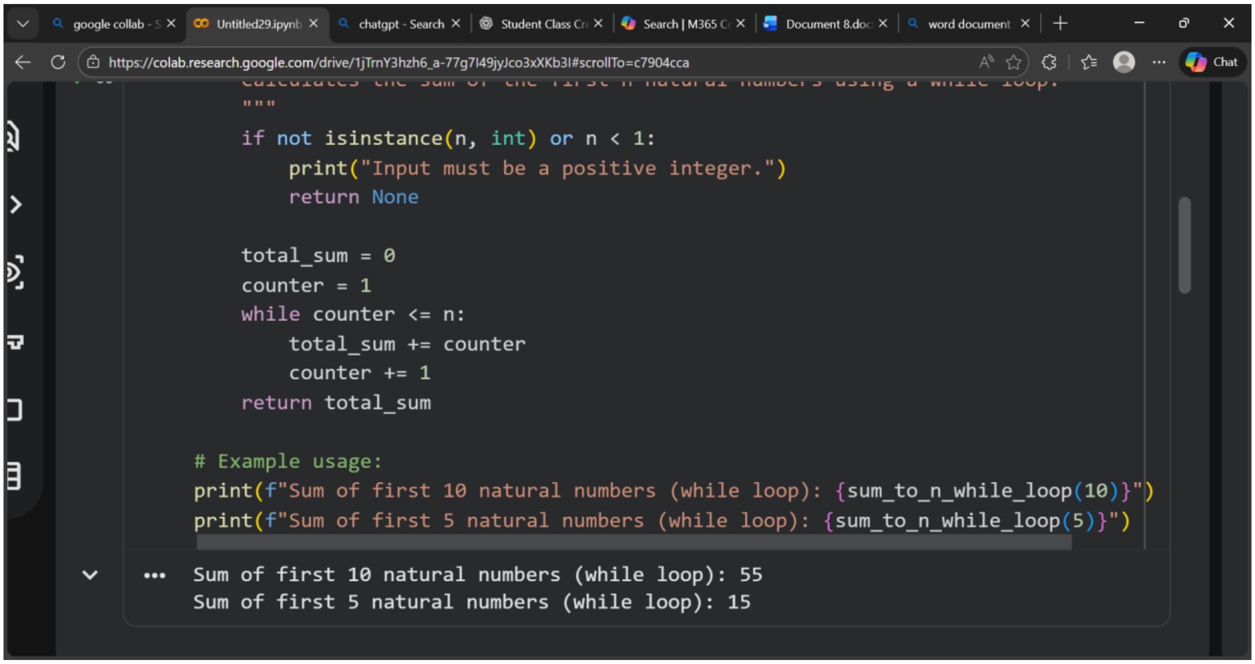
2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Output:



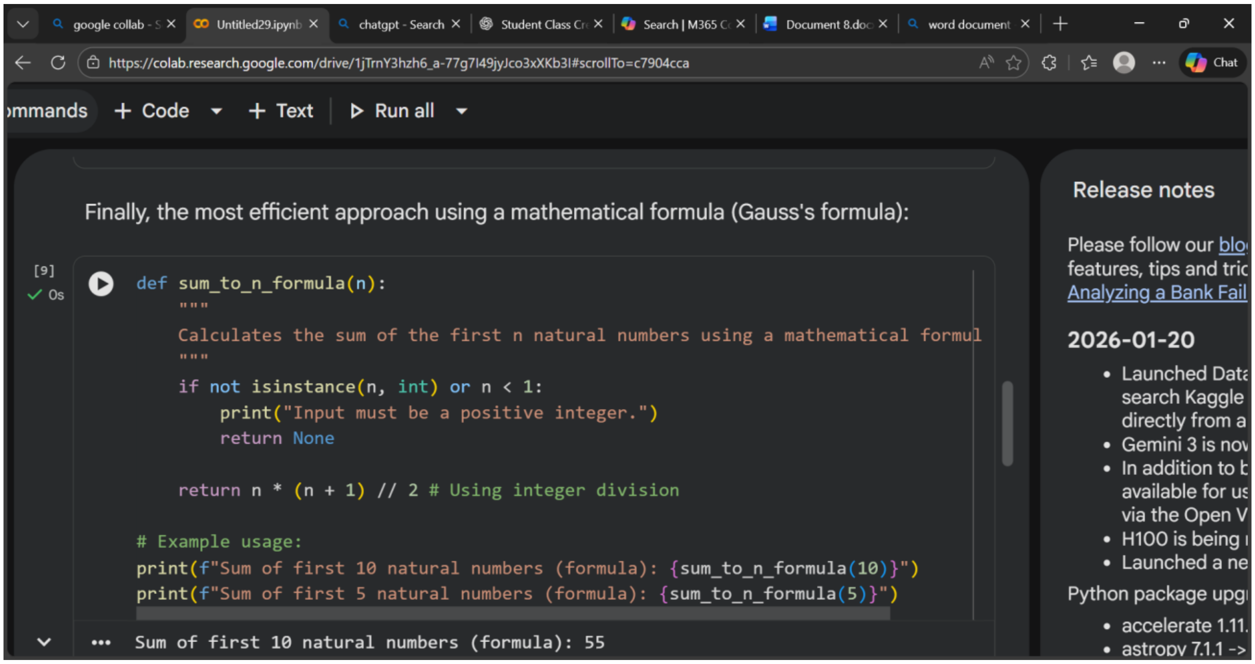
```
    Calculates the sum of the first n natural numbers using a while loop.
    """
    if not isinstance(n, int) or n < 1:
        print("Input must be a positive integer.")
        return None

    total_sum = 0
    counter = 1
    while counter <= n:
        total_sum += counter
        counter += 1
    return total_sum

# Example usage:
print(f"Sum of first 10 natural numbers (while loop): {sum_to_n_while_loop(10)}")
print(f"Sum of first 5 natural numbers (while loop): {sum_to_n_while_loop(5)}")
```

```
Sum of first 10 natural numbers (while loop): 55
Sum of first 5 natural numbers (while loop): 15
```

3)input:



Finally, the most efficient approach using a mathematical formula (Gauss's formula):

```
def sum_to_n_formula(n):
    """
    Calculates the sum of the first n natural numbers using a mathematical formul
    """
    if not isinstance(n, int) or n < 1:
        print("Input must be a positive integer.")
        return None

    return n * (n + 1) // 2 # Using integer division

# Example usage:
print(f"Sum of first 10 natural numbers (formula): {sum_to_n_formula(10)}")
print(f"Sum of first 5 natural numbers (formula): {sum_to_n_formula(5)}")
```

```
Sum of first 10 natural numbers (formula): 55
```

Release notes

Please follow our blo
features, tips and tric
Analyzing a Bank Fail

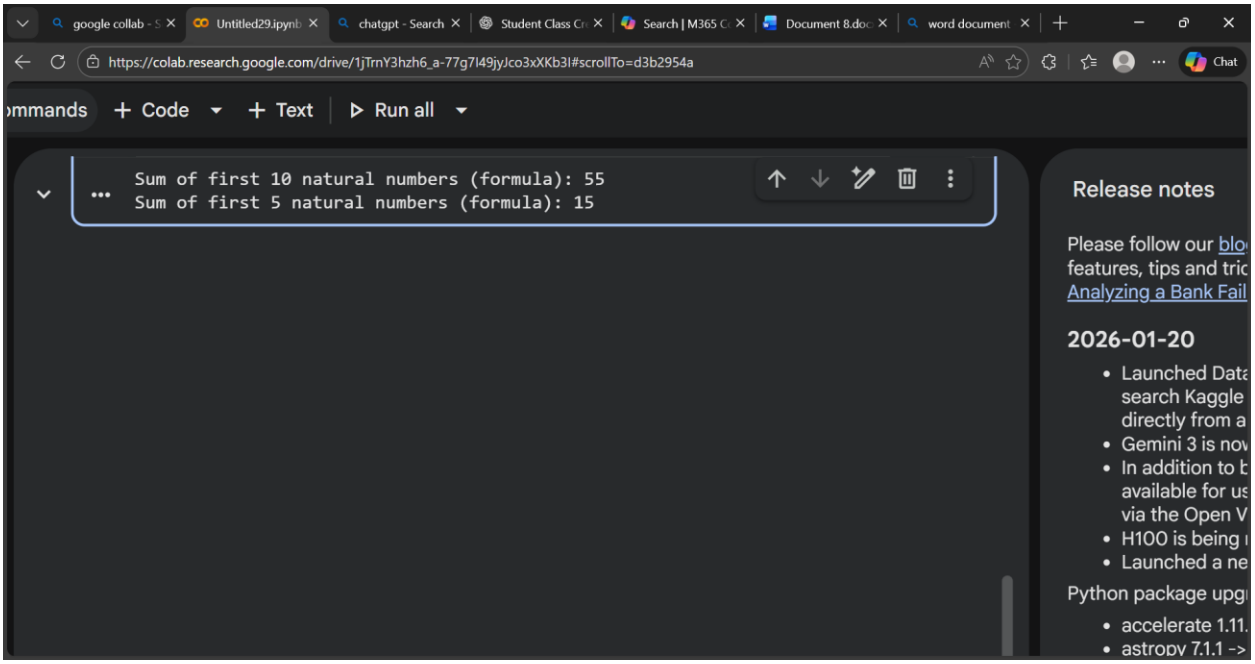
2026-01-20

- Launched Data
  search Kaggle
  directly from a
- Gemini 3 is nov
- In addition to b
  available for us
  via the Open V
- H100 is being
- Launched a ne

Python package upg

- accelerate 1.11.
- astropy 7.1.1 ->

Output:



```
Sum of first 10 natural numbers (formula): 55
Sum of first 5 natural numbers (formula): 15
```

Release notes

Please follow our blo
features, tips and tric
Analyzing a Bank Fail

2026-01-20

- Launched Data
  search Kaggle
  directly from a
- Gemini 3 is nov
- In addition to b
  available for us
  via the Open V
- H100 is being
- Launched a ne

Python package upg

- accelerate 1.11.
- astropy 7.1.1 ->

Explanation:

- In the **for loop**, the program repeats from 1 to n and keeps adding numbers to `total`.
- In the **while loop**, the same addition happens but the loop runs based on a condition (`i <= n`).

Task 5: Classes (Bank Account Class)

Prompt: Write a Python program to create a BankAccount class.

Requirements:

- Attributes: account_holder, balance

- Methods:

deposit(amount) – add money

withdraw(amount) – deduct money if sufficient balance

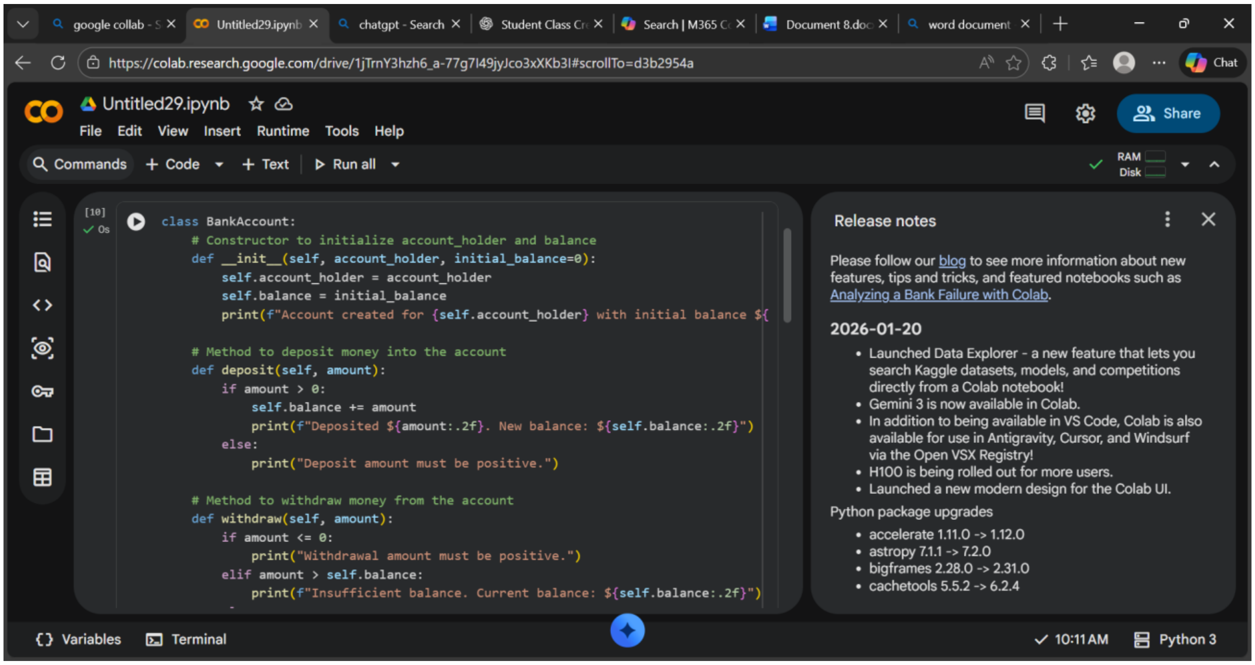
check_balance() – display current balance

- Include comments in the code.

- Create an object and demonstrate deposit and withdrawal.

- Keep it simple and beginner-friendly.

Input:



```
class BankAccount:
    # Constructor to initialize account_holder and balance
    def __init__(self, account_holder, initial_balance=0):
        self.account_holder = account_holder
        self.balance = initial_balance
        print(f"Account created for {self.account_holder} with initial balance ${

    # Method to deposit money into the account
    def deposit(self, amount):
        if amount > 0:
            self.balance += amount
            print(f"Deposited ${amount:.2f}. New balance: ${self.balance:.2f}")
        else:
            print("Deposit amount must be positive.")

    # Method to withdraw money from the account
    def withdraw(self, amount):
        if amount <= 0:
            print("Withdrawal amount must be positive.")
        elif amount > self.balance:
            print(f"Insufficient balance. Current balance: ${self.balance:.2f}")
```

Release notes

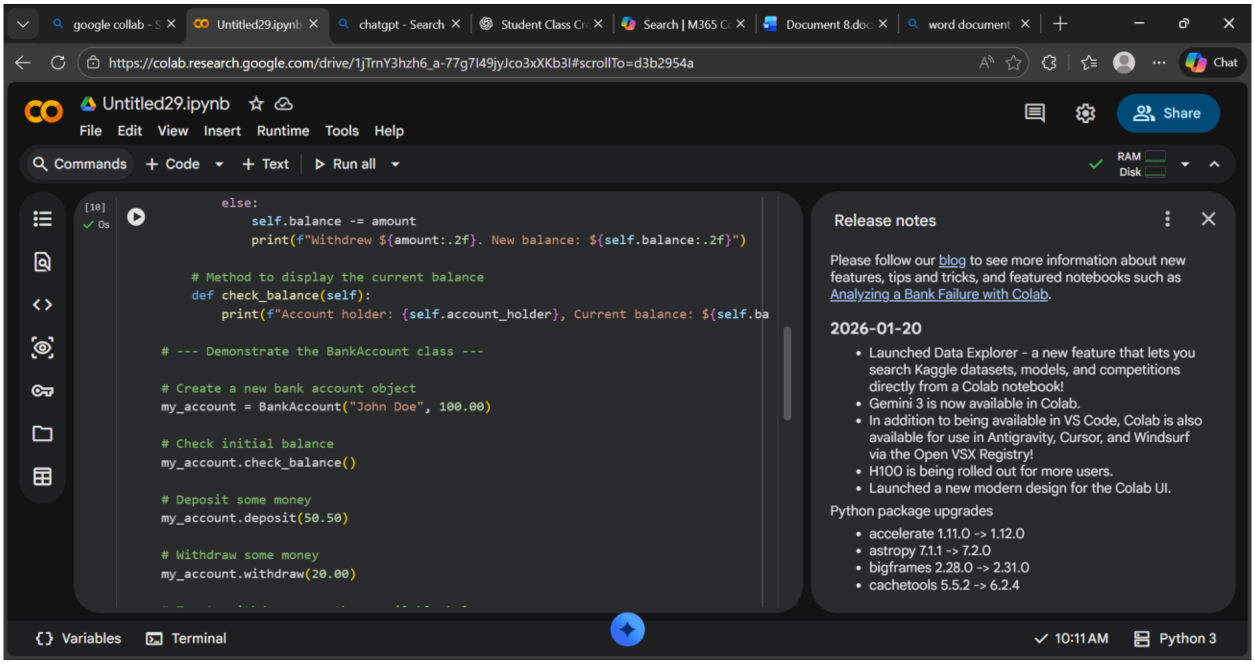
Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4



```
        else:
            self.balance -= amount
            print(f"Withdrew ${amount:.2f}. New balance: ${self.balance:.2f}")

    # Method to display the current balance
    def check_balance(self):
        print(f"Account holder: {self.account_holder}, Current balance: ${self.ba

# --- Demonstrate the BankAccount class ---

# Create a new bank account object
my_account = BankAccount("John Doe", 100.00)

# Check initial balance
my_account.check_balance()

# Deposit some money
my_account.deposit(50.50)

# Withdraw some money
my_account.withdraw(20.00)
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

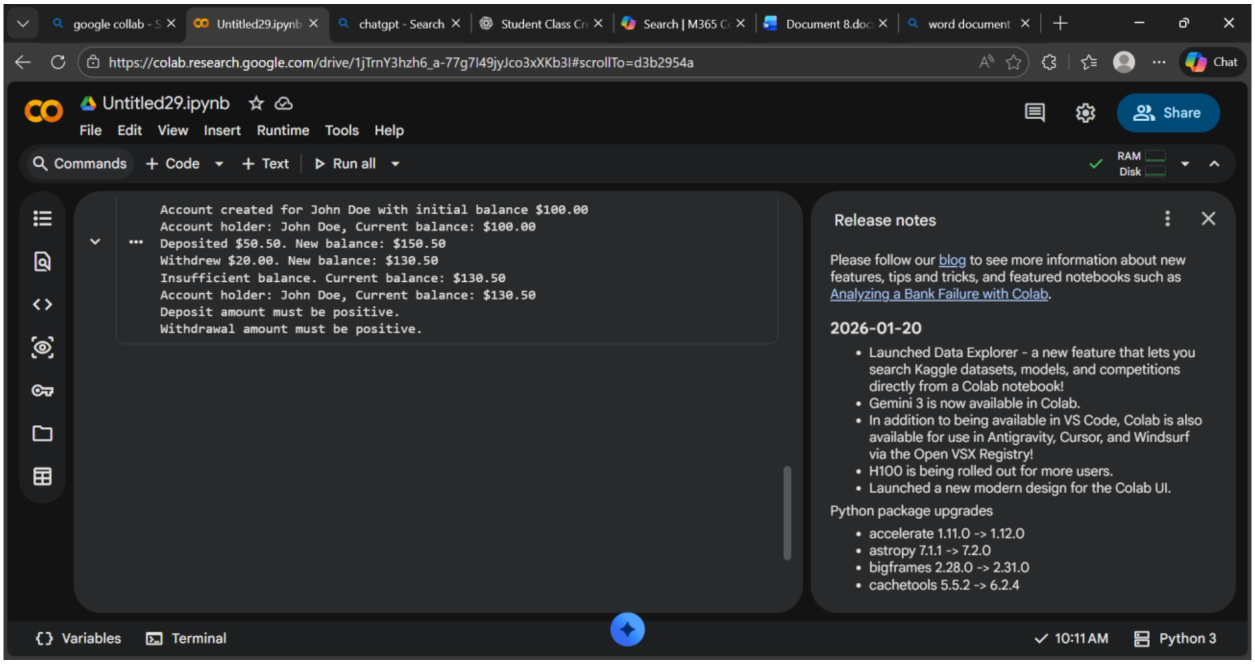
2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

Output:



```
Account created for John Doe with initial balance $100.00
Account holder: John Doe, Current balance: $100.00
Deposited $50.50. New balance: $150.50
Withdrew $20.00. New balance: $130.50
Insufficient balance. Current balance: $130.50
Account holder: John Doe, Current balance: $130.50
Deposit amount must be positive.
Withdrawal amount must be positive.
```

Release notes

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

2026-01-20

- Launched Data Explorer - a new feature that lets you search Kaggle datasets, models, and competitions directly from a Colab notebook!
- Gemini 3 is now available in Colab.
- In addition to being available in VS Code, Colab is also available for use in Antigravity, Cursor, and Windsurf via the Open VSX Registry!
- H100 is being rolled out for more users.
- Launched a new modern design for the Colab UI.

Python package upgrades

- accelerate 1.11.0 -> 1.12.0
- astropy 7.1.1 -> 7.2.0
- bigframes 2.28.0 -> 2.31.0
- cachetools 5.5.2 -> 6.2.4

- Explanation:
- The **class** represents a bank account.
- The **constructor (`__init__`)** sets account holder name and initial balance.
- `deposit()` increases balance.
- `withdraw()` checks balance before deducting (prevents overdraft).
- `check_balance()` shows account details.

[redacted]