

Prime Number Generator and Checker

Report

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Introduction

This Python code provides two functions: a prime number checker and a prime number generator. The `is_prime(n)` function checks if a number n is prime by testing divisibility up to its square root. The `prime_generator(limit)` function generates prime numbers up to a given limit using the `is_prime()` function. This approach ensures efficient prime checking and generation. The code can be used for mathematical applications or any program requiring prime number operations.

METHODOLOGY

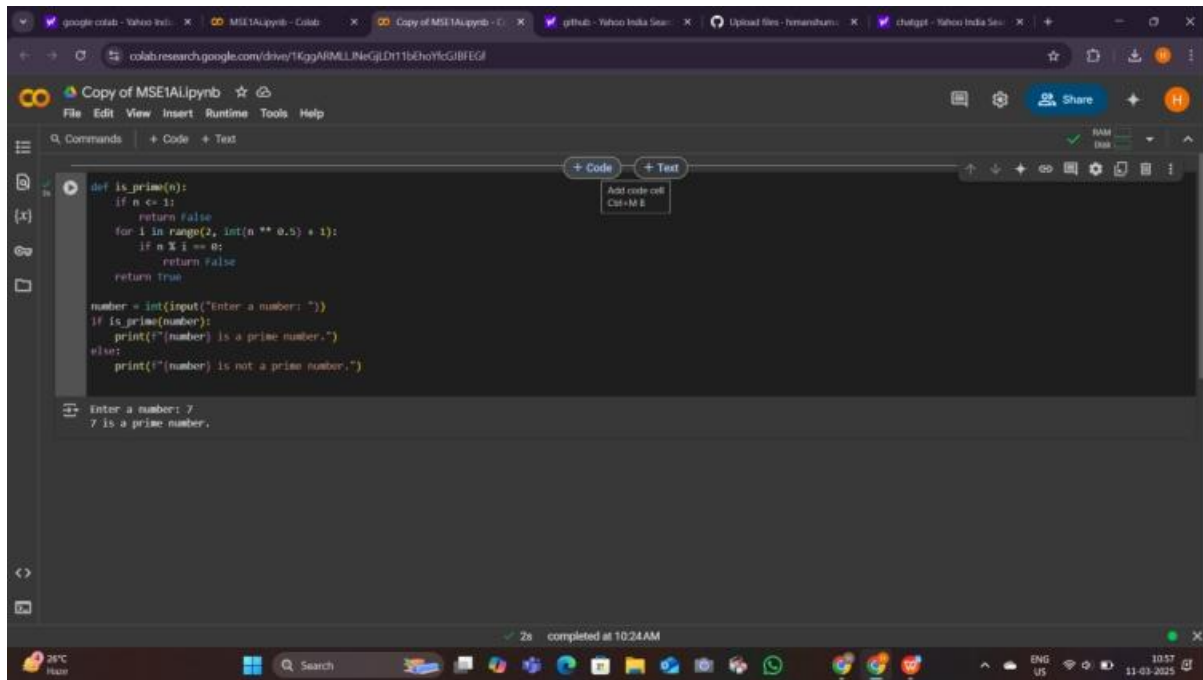
The code consists of two main components: a prime number checker and a prime number generator. The **prime number checker** (`is_prime(n)`) works by testing whether a number n is divisible by any integer between 2 and the square root of n . If any divisor is found, the number is not prime; otherwise, it is considered prime. This method improves efficiency by reducing the number of checks needed.

The **prime number generator** (`prime_generator(limit)`) generates all prime numbers up to a specified limit. It uses the `is_prime()` function to check each number from 2 to the limit, yielding primes one at a time. This approach ensures that prime numbers are produced in a memory-efficient manner, without storing all primes at once, making it suitable for handling large ranges.

CODE TYPED

```
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  
  
number = int(input("Enter a number: "))  
if is_prime(number):  
    print(f"{number} is a prime number.")  
else:  
    print(f"{number} is not a prime number.")
```

ScreenShots Output photo pasted



The screenshot shows a Google Colab notebook titled "Copy of MSE1Alipynb". The code defines a function `is_prime(n)` that checks if a number is prime. It then prompts the user to enter a number, and the output shows that 7 is a prime number.

```
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  
  
number = int(input("Enter a number: "))  
if is_prime(number):  
    print(f"{number} is a prime number.")  
else:  
    print(f"{number} is not a prime number.")
```

Enter a number: 7
7 is a prime number.

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