# Title Page

**Problem Statement:** Create a Python program to check if a number is prime and generate all prime numbers up to a given limit.
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## Introduction

Prime numbers are numbers that have only two factors: 1 and themselves. This report presents a Python program that provides a menu-driven interface to check if a number is prime and to generate all prime numbers up to a specified limit.

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## Methodology

The program uses a menu-driven system allowing users to choose between:

1. Checking whether a given number is prime.
2. Generating all prime numbers up to a given limit.
3. Exiting the program.

The logic used for checking prime numbers is based on iterating through possible divisors up to the square root of the number. If a number is divisible by any number within this range, it is not prime.

To generate prime numbers up to a limit, the program iterates through numbers from 2 to the limit and applies the prime-checking logic.

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**Code**

```
def generate_primes(limit):
    """Generate and print all prime numbers up to a given limit."""
    primes = []
    for num in range(2, limit + 1):
        for i in range(2, int(num**0.5) + 1):
            if num % i == 0:
                break
        else:
            primes.append(num)
    print("Prime numbers up to", limit, ":", primes)


# Menu-based system to allow user interaction
while True:
    # Display menu options
    print("\n1. Check if a number is prime")
    print("2. Generate prime numbers up to a limit")
    print("3. Exit")
```

```
    # Take user input
    choice = input("Enter your choice: ")

    if choice == '1':  # Option to check if a number is prime
        num = int(input("Enter a number: "))
        if num < 2:
            print(f"{num} is not a prime number.")
        else:
            for i in range(2, int(num**0.5) + 1):
                if num % i == 0:
                    print(f"{num} is not a prime number.")
                    break
            else:
                print(f"{num} is a prime number.")

    elif choice == '2':  # Option to generate prime numbers up to a limit
        limit = int(input("Enter the limit: "))
        generate_primes(limit)

    elif choice == '3':  # Exit the program
```

```
        print("Exiting...")
        break  # Break the loop to stop the program

    else:  # Handle invalid input
        print("Invalid choice! Please try again.")
```

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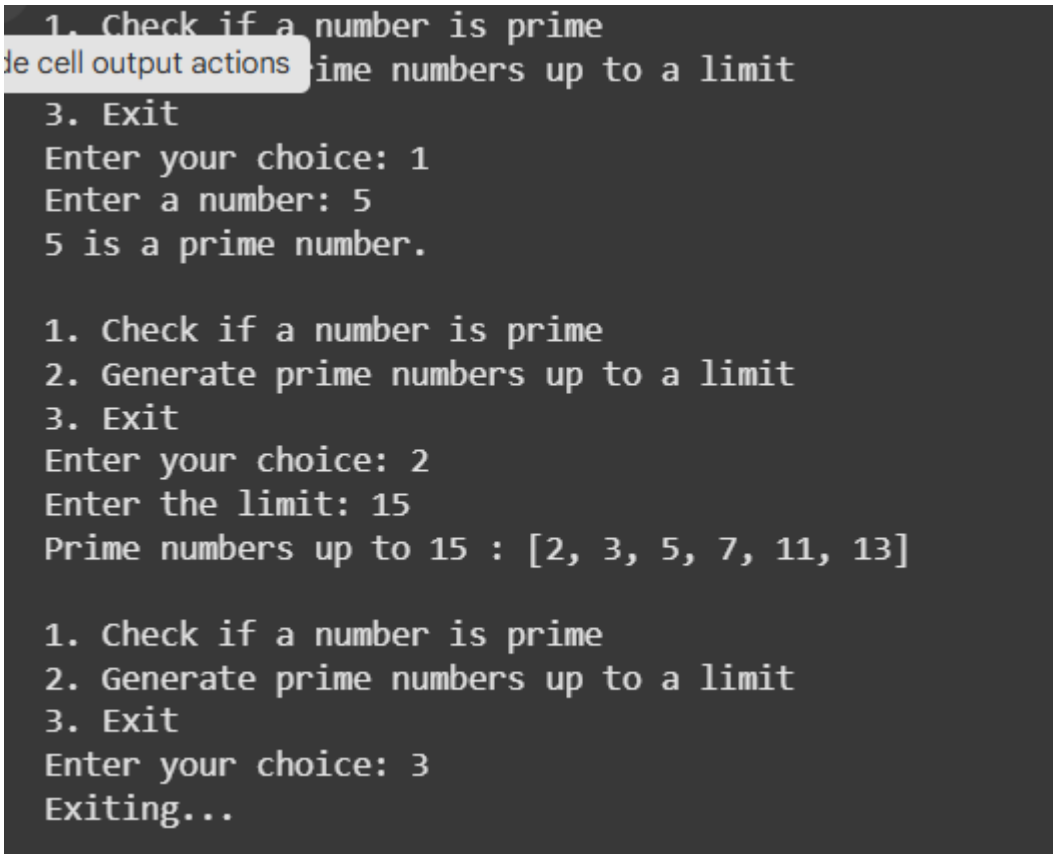
## Output/Result

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## References/Credits

- Python Documentation: https://docs.python.org/3/
- Algorithm used: Square root method for prime checking