**1. FizzBuzz:**

Python

def fizzbuzz(n):  
    for num in range(1, n + 1):  
        if num % 3 == 0 and num % 5 == 0:  
            print("FizzBuzz")  
        elif num % 3 == 0:  
            print("Fizz")  
        elif num % 5 == 0:  
            print("Buzz")  
        else:  
            print(num)  
  
fizzbuzz(50)

**2. Even or Odd:**

Python

def is\_even(num):  
    return num % 2 == 0  
  
# Example usage:  
print(is\_even(4))  # Output: True  
print(is\_even(7))  # Output: False

**3. Prime Numbers:**

Python

def is\_prime(num):  
    if num <= 1:  
        return False  
    for i in range(2, int(num\*\*0.5) + 1):  
        if num % i == 0:  
            return False  
    return True  
  
def print\_primes(limit):  
    for num in range(2, limit + 1):  
        if is\_prime(num):  
            print(num)  
  
print\_primes(100)

**4. Factorial:**

Python

def factorial(n):  
    if n == 0:  
        return 1  
    else:  
        return n \* factorial(n - 1)  
  
# Example usage:  
print(factorial(5))  # Output: 120

**5. Leap Year:**

Python

def is\_leap\_year(year):  
    return (year % 4 == 0 and year % 100 != 0) or year % 400 == 0  
  
# Example usage:  
print(is\_leap\_year(2024))  # Output: True  
print(is\_leap\_year(2022))  # Output: False

**6. Sum of Even Numbers:**

Python

def sum\_even\_numbers(numbers):  
    return sum(num for num in numbers if num % 2 == 0)  
  
# Example usage:  
numbers = [1, 2, 3, 4, 5, 6]  
print(sum\_even\_numbers(numbers))  # Output: 12

**7. Fibonacci Sequence:**

Python

def fibonacci(n):  
    fib\_sequence = [0, 1]  
    for i in range(2, n + 1):  
        fib\_sequence.append(fib\_sequence[i - 1] + fib\_sequence[i - 2])  
    return fib\_sequence  
  
# Example usage:  
print(fibonacci(10))  # Output: [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]

**8. Palindrome Check:**

Python

def is\_palindrome(string):  
    return string == string[::-1]  
  
# Example usage:  
print(is\_palindrome("racecar"))  # Output: True  
print(is\_palindrome("hello"))  # Output: False

**9. Vowel Count:**

Python

def count\_vowels(string):  
    vowels = "aeiouAEIOU"  
    count = 0  
    for char in string:  
        if char in vowels:  
            count += 1  
    return count  
  
# Example usage:  
print(count\_vowels("hello world"))  # Output: 3

**10. Multiplication Table:**

Python

def print\_multiplication\_table(n):  
    for i in range(1, n + 1):  
        for j in range(1, n + 1):  
            print(f"{i} x {j} = {i \* j}")  
        print()  
  
print\_multiplication\_table(10)