In [4]:

```python
# 1. Conditional Statements
print("Conditional Statements:")

# if statement
age = 20
if age >= 18:
    print("You are an adult.")  # Output: You are an adult.

# if-else statement
temperature = 15
if temperature > 20:
    print("It's warm outside.")
else:
    print("It's cold outside.")  # Output: It's cold outside.

# if-elif-else statement
day = 'Monday'
if day == 'Saturday' or day == 'Sunday':
    print("It's the weekend.")
elif day == 'Friday':
    print("It's almost the weekend.")
else:
    print("It's a weekday.")  # Output: It's a weekday.

# Nested if statements
num = 5
if num > 0:
    if num % 2 == 0:
        print("The number is positive and even.")
    else:
        print("The number is positive and odd.")  # Output: The number is positive and o

# 2. Loops
print("\nLoops:")

# for loop
for i in range(5):  # Generates numbers from 0 to 4
    print(i, end=' ')  # Output: 0 1 2 3 4
print()

# Iterating over a list
fruits = ['apple', 'banana', 'cherry']
for fruit in fruits:
    print(fruit, end=' ')  # Output: apple banana cherry
print()

# while loop
count = 0
while count < 3:
    print(count, end=' ')  # Output: 0 1 2
    count += 1
print()

# Break statement
print("Break Statement:")
for i in range(6):
    if i == 3:
        break  # Exits the loop when i is 3
    print(i, end=' ')  # Output: 0 1 2
print()

# Continue statement
print("Continue Statement:")
for i in range(6):
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    if i == 3:
        continue  # Skips the rest of the loop when i is 3
    print(i, end=' ')  # Output: 0 1 2 4 5
print()

# 3. Loop Control with Else
print("\nLoop Control with Else:")

# for loop with else
for i in range(3):
    print(i, end=' ')  # Output: 0 1 2
else:
    print("Loop completed.")  # Output: Loop completed.

# while loop with else
count = 0
while count < 3:
    print(count, end=' ')  # Output: 0 1 2
    count += 1
else:
    print("While loop completed.")  # Output: While loop completed.

# 4. `range` Function Variants
print("\nRange Function Variants:")

# Using range(stop)
print("Using range(stop):")
for i in range(5):  # Generates numbers from 0 to 4
    print(i, end=' ')  # Output: 0 1 2 3 4
print()

# Using range(start, stop)
print("\nUsing range(start, stop):")
for i in range(2, 8):  # Generates numbers from 2 to 7
    print(i, end=' ')  # Output: 2 3 4 5 6 7
print()

# Using range(start, stop, step)
print("\nUsing range(start, stop, step):")
for i in range(1, 10, 2):  # Generates numbers from 1 to 9 with a step of 2
    print(i, end=' ')  # Output: 1 3 5 7 9
print()

# Demonstrating range with negative step
print("\nUsing range(start, stop, step) with negative step:")
for i in range(10, 0, -2):  # Generates numbers from 10 to 2 with a step of -2
    print(i, end=' ')  # Output: 10 8 6 4 2
print()

# Demonstrating range with large step and negative range
print("\nUsing range with large step:")
for i in range(0, 20, 5):  # Generates numbers from 0 to 15 with a step of 5
    print(i, end=' ')  # Output: 0 5 10 15
print()

# Demonstrating range in a while loop
print("\nUsing range in a while loop:")
index = 0
while index < len(range(5)):  # Equivalent to range(5) - 0 to 4
    print(index, end=' ')  # Output: 0 1 2 3 4
    index += 1
print()
```

```
Conditional Statements:
You are an adult.
It's cold outside.
```

```
It's a weekday.
The number is positive and odd.

Loops:
0 1 2 3 4
apple banana cherry
0 1 2
Break Statement:
0 1 2
Continue Statement:
0 1 2 4 5

Loop Control with Else:
0 1 2 Loop completed.
0 1 2 While loop completed.

Range Function Variants:
Using range(stop):
0 1 2 3 4

Using range(start, stop):
2 3 4 5 6 7

Using range(start, stop, step):
1 3 5 7 9

Using range(start, stop, step) with negative step:
10 8 6 4 2

Using range with large step:
0 5 10 15

Using range in a while loop:
0 1 2 3 4
```

In [ ]: