In [7]:
```python
# 1 Write a function that takes a string
# as input and returns the number of vowels in the string.
def count_vowels(string):
    vowels = "aeiouAEIOU"
    count = 0
    for char in string:
        if char in vowels:
            count += 1
    return count

print(count_vowels("Hello World!"))
print(count_vowels("Python"))
```

```
3
1
```

In [8]:
```python
# 2 Write a function that takes two lists as
# input and returns the common elements in both lists.
def common_elements(list1, list2):
    return [element for element in list1 if element in list2]

print(common_elements([1, 2, 3, 4], [3, 4, 5, 6]))
print(common_elements(["apple", "banana"], ["cherry","banana"]))
```

```
[3, 4]
['banana']
```

In [9]:
```python
# 3 Write a function that takes a list of numbers
# as input and returns the sum of the numbers in the list.

def sum_of_numbers(numbers):
    return sum(numbers)

print(sum_of_numbers([1, 2, 3, 4, 5]))
print(sum_of_numbers([10, 20, 30]))
```

```
15
60
```

In [13]:
```python
# 4 Write a function that takes a list of strings
# as input and returns the longest string in the list.
def longest_string(strings):
    return max(strings, key=len)

print(longest_string(["apple", "banana", "cherry"]))
print(longest_string(["python", "java", "javascript"]))
```

```
banana
javascript
```

In [14]:
```python
# 5 Write a function that takes both positional and keyword arguments
# to welcome Smith and Abraham
def greet(name, message="Hello"):
    print(message, name)

# positional arguments
greet("John")
greet("Jane", "Hi")

# keyword arguments
greet(message="Good morning", name="Bob")
greet(name="Alice", message="Good evening")
```

```
Hello John
Hi Jane
Good morning Bob
Good evening Alice
```

In [15]:
```python
# 6 Write a Python function that takes an arbitrary
# number of numbers as arguments and returns the average of the numbers.
def average(*numbers):
    sum = 0
    for number in numbers:
        sum += number
    return sum / len(numbers)

# arbitrary arguments
result = average(1, 2, 3, 4, 5)
print("The average is:", result)
```

```
The average is: 3.0
```

In [16]:
```python
# 7 Write a function that takes two numbers as
#input and returns the greatest common divisor (GCD) of the two numbers.
def gcd(a, b):
    if b == 0:
        return a
    else:
        return gcd(b, a % b)

print(gcd(12, 15))
print(gcd(24, 60))
```

```
3
12
```

In [25]:
```python
# 8 Write a function that takes a string as input and
# returns the reverse of the string.
def reverse_string(string):
    return string[::-1]

print(reverse_string("Hello World!"))
print(reverse_string("Python"))
```

```
!dlroW olleH
nohtyP
```

In [26]:
```python
# 9 Write a function that takes a string as input and
# returns a new string with all the spaces removed.
def remove_spaces(string):
    return "".join(string.split())

print(remove_spaces("Hello World!"))
print(remove_spaces("Python   Programmer"))
```

```
HelloWorld!
PythonProgrammer
```

In [27]:
```python
# 10 Write a function that takes a list of numbers
# as input and returns a new list with all the duplicates removed.
def remove_duplicates(numbers):
    return list(set(numbers))

print(remove_duplicates([1, 2, 3, 1, 2, 4, 5]))
print(remove_duplicates([2, 3, 4, 2, 3, 5, 6, 5]))
```

```
[1, 2, 3, 4, 5]
[2, 3, 4, 5, 6]
```

In [ ]:

Exercise 1

In [1]:
```
#1
# Option 1
def calculateCurve(score):
  if score >= 90:
    curve = 5
  elif score >= 80:
    curve = 10
  else:
    curve = 20

  total = score + curve

  return total

calculateCurve(50)
```

Out[1]: 70

In [2]:
```
#1
# Option 2
def calculateCurve(score):
  if score < 0 or score > 100:
    raise ValueError("Score must be between 0 and 100")

  if score >= 90:
    curve = 5
  elif score >= 80:
    curve = 10
  else:
    curve = 20

  total = score + curve

  return total

try:
  result = calculateCurve(50)
  print("The total score is:", result)
except ValueError as error:
  print(error)
```

```
The total score is: 70
```

Exercise 2

In [3]:
```
# Option 1
def multipleOfFive():
  num = int(input("Enter a number to check the multiple of 5:"))
  if num % 5 == 0:
    print(num,"is a multiple of 5")
  else:
    print(num,"is not a multiple of 5")

multipleOfFive()
```

```
Enter a number to check the multiple of 5:42
42 is not a multiple of 5
```

In [ ]:
```
# Option 2
def isMultipleOfFive(num):
  if num % 5 == 0:
    return True
  else:
    return False



def multipleOfFive():
  while True:
    try:
      num = int(input("Enter a number to check if it is a multiple of 5: "))
      break
    except ValueError:
      print("Invalid input. Please enter a valid integer.")

  if isMultipleOfFive(num):
    print(num, "is a multiple of 5")
  else:
    print(num, "is not a multiple of 5")

multipleOfFive()
```

```
Enter a number to check if it is a multiple of 5: 78
78 is not a multiple of 5
```

Exercise 3

In [4]:
```
# Option 1
# Calculate hypotenuse
import math
def calculateHypo():
  side1 = int(input("Enter a side value: "))
  side2 = int(input("Enter another side value: "))
  hy = math.hypot(side1, side2)
  #return f"{hy:.2f}"
  return round(hy,2)

calculateHypo()
```

```
Enter a side value: 12
Enter another side value: 15
```

Out[4]:
```
19.21
```

In [ ]:
```
# Option 2

import math

def calculateHypo():
  while True:
    try:
      side1 = float(input("Enter the first side value: "))
      break
    except ValueError:
      print("Invalid input. Please enter a valid number.")

  while True:
    try:
      side2 = float(input("Enter the second side value: "))
      break
    except ValueError:
      print("Invalid input. Please enter a valid number.")

  hy = math.hypot(side1, side2)
  return round(hy, 2)

result = calculateHypo()
print("The length of the hypotenuse is:", result)
```

```
Enter the first side value: lkj
Invalid input. Please enter a valid number.
Enter the first side value: pok
Invalid input. Please enter a valid number.
Enter the first side value: 125
Enter the second side value: lkoi
Invalid input. Please enter a valid number.
Enter the second side value: 25
The length of the hypotenuse is: 127.48
```

Exercise 4

In [33]:
```
# Option 1
import random

def play():

  times_to_play = int(input("How many times do you want to play: "))

  p1_total = 0
  p2_total = 0
  head = 1
  tail = 2

  for i in range(times_to_play):

    if random.randint(head, tail) == head:
      p1_total += 10
    else:
      p2_total += 10

  print("Total points for player 1:",p1_total)
  print("Total points for player 2:",p2_total)

  if p1_total > p2_total:
    print("Player 1 wins!")
  elif p2_total > p1_total:
    print("Player 2 wins!")
  else:
    print("It's a tie!")

play()
```

```
How many times do you want to play: 5
Total points for player 1: 20
Total points for player 2: 30
Player 2 wins!
```

In [29]:
```
# Option 2
import random

def play():
  while True:
    try:
      times_to_play = int(input("How many times do you want to play: "))
      if times_to_play <= 0:
        raise ValueError
      break
    except ValueError:
      print("Invalid input. Please enter a positive integer.")

  p1_total = 0
  p2_total = 0
  head = 1
  tail = 2

  for i in range(times_to_play):

    if random.randint(head, tail) == head:
      p1_total += 10
    else:
      p2_total += 10

  print("Total points for player 1:",p1_total)
  print("Total points for player 2:",p2_total)

  if p1_total > p2_total:
    print("Player 1 wins!")
  elif p2_total > p1_total:
    print("Player 2 wins!")
  else:
    print("It's a tie!")

play()
```

```
How many times do you want to play: 5
Total points for player 1: 20
Total points for player 2: 30
Player 2 wins!
```

Exercise 5

In [34]:
```
# Option 1
def factorial(number):

  if number < 1:
    print("Enter a positive value!")
  elif number == 1:
    return 1
  else:
    res = number * factorial(number-1)
    return res

print(f"Result: {factorial(5)}")
```

```
Result: 120
```

In [ ]:
```
# Option 2
def factorial(number):
  if number < 0:
    return "Enter a non-negative value!"
  elif number <= 1:
    return 1
  else:
    res = number * factorial(number-1)
    return res

factorial_result = factorial(10)
if type(factorial_result) == int:
  print("The factorial is", factorial_result)
else:
  print(factorial_result)
```

```
The factorial is 3628800
```

Exercise 6

In [ ]:
```
def check_grade(score):
  if score >= 90:
    return "A"
  elif score >= 80:
    return "B"
  elif score >= 70:
    return "C"
  elif score >= 60:
    return "D"
  else:
    return "F"


def get_score():
  while True:
    score = int(input("Enter your score: "))
    if score < 0 or score > 100:
      print("The score should be between 0 and 100.")
      continue
    print("Your grade is:", check_grade(score))
    if input("Want to continue (y/n)? ").lower() != 'y':
      break


try:
  get_score()
except ValueError:
  print("Invalid input. Only numbers are allowed.")
  get_score()
```

```
Enter your score: 120
The score should be between 0 and 100.
Enter your score: 150
The score should be between 0 and 100.
Enter your score: 85
Your grade is: B
Want to continue (y/n)? y
Enter your score: dfdfdf
Invalid input. Only numbers are allowed.
Enter your score: 96
Your grade is: A
Want to continue (y/n)? n
```