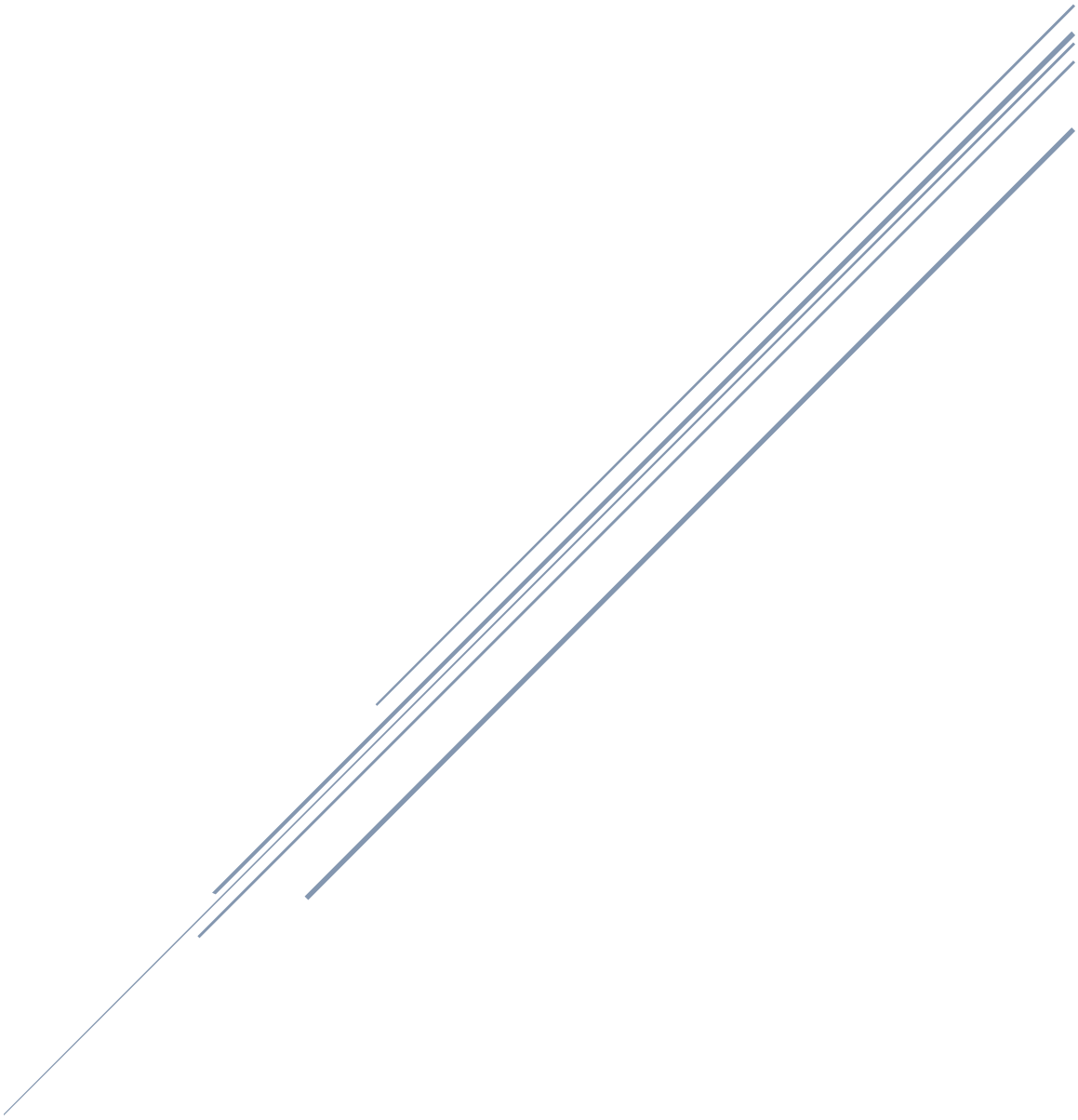
BASIC PROBLEMS

Python



1. Basic Arithmetic Operations

1. Write a program to add two numbers.
2. Write a program to subtract two numbers.
3. Write a program to multiply two numbers.
4. Write a program to divide two numbers.
5. Write a program to find the remainder when one number is divided by another.
6. Write a program to find the area of a circle given its radius.
7. Write a program to convert Celsius to Fahrenheit.
8. Write a program to find the perimeter of a rectangle given its length and width.
9. Write a program to calculate the average of three numbers.
10. Write a program to find the square root of a number.

2. Control Flow (Conditionals and Loops)

1. Write a program to check if a number is even or odd.
2. Write a program to check if a number is positive, negative, or zero.
3. Write a program that prints numbers from 1 to 100 using a loop.
4. Write a program to find the factorial of a number using a loop.
5. Write a program to check if a given year is a leap year.
6. Write a program to print the first 10 numbers in the Fibonacci sequence.
7. Write a program to find the sum of all even numbers from 1 to 100.
8. Write a program to print the multiplication table of a number.
9. Write a program to reverse a number (e.g., 123 becomes 321).
10. Write a program to check if a number is prime.

3. Functions

1. Write a function to add two numbers and return the result.
2. Write a function to find the maximum of three numbers.
3. Write a function to check if a string is a palindrome.
4. Write a function to find the sum of a list of numbers.
5. Write a function to return the length of a string.
6. Write a function that accepts a list of numbers and returns the smallest number.
7. Write a function that calculates the factorial of a number using recursion.
8. Write a function that returns the nth Fibonacci number.
9. Write a function to count the number of vowels in a string.
10. Write a function that converts a given temperature from Fahrenheit to Celsius.

4. Lists and Tuples

1. Write a program to find the largest number in a list.
2. Write a program to find the smallest number in a list.
3. Write a program to calculate the sum of all numbers in a list.
4. Write a program to multiply all numbers in a list.
5. Write a program to count the occurrences of an element in a list.

6. Write a program to remove duplicates from a list.
7. Write a program to reverse a list.
8. Write a program to merge two lists into one.
9. Write a program to find the index of an element in a list.
10. Write a program to create a tuple with different data types and print each element.

5. Dictionaries and Sets

1. Write a program to create a dictionary of three key-value pairs and print it.
2. Write a program to access a value in a dictionary by its key.
3. Write a program to add a new key-value pair to a dictionary.
4. Write a program to remove a key from a dictionary.
5. Write a program to check if a key exists in a dictionary.
6. Write a program to iterate through all key-value pairs in a dictionary.
7. Write a program to merge two dictionaries.
8. Write a program to create a set and add elements to it.
9. Write a program to remove duplicates from a list using a set.
10. Write a program to find the union of two sets.

6. String Manipulation

1. Write a program to count the number of characters in a string.
2. Write a program to convert a string to uppercase.
3. Write a program to check if a string contains only numbers.
4. Write a program to replace all occurrences of a substring in a string.
5. Write a program to find the index of the first occurrence of a substring.
6. Write a program to check if a string starts with a specific substring.
7. Write a program to reverse a string.
8. Write a program to find the length of a string without using `len()`.
9. Write a program to remove whitespace from the beginning and end of a string.
10. Write a program to count the number of vowels in a string.

7. File I/O

1. Write a program to read a file and print its contents.
2. Write a program to create a new file and write some text into it.
3. Write a program to append text to an existing file.
4. Write a program to count the number of lines in a file.
5. Write a program to count the number of words in a file.
6. Write a program to copy the contents of one file to another file.
7. Write a program to read a file line by line and print each line.
8. Write a program to check if a file exists.
9. Write a program to delete a file.
10. Write a program to find the size of a file.

8. Classes and Objects

1. Create a `Car` class with attributes like `make`, `model`, and `year`. Create an object of this class.
2. Write a class method to print out a description of the car.
3. Write a class with a method that returns the square of a number.
4. Create a `Person` class with `first_name` and `last_name` attributes. Create an object and print the person's full name.
5. Write a class with a method that calculates the area of a rectangle.
6. Create a `Dog` class with attributes like `name` and `breed`. Add a method to make the dog bark.
7. Create a `BankAccount` class with attributes `balance` and methods for deposit and withdrawal.
8. Write a class with a method that returns the factorial of a number.
9. Create a `Book` class with attributes like `title`, `author`, and `pages`. Add a method to display the book’s details.
10. Write a class with a static method to check if a number is even or odd.