APOLLO COMPUTER EDUCATION

PYTHON EXERCISES

1. Variable Declaration and Initialization:

Declare variables of different data types (integer, float, string,) and initialize them with appropriate values.

Example: Declare variables

- name' (string),
- age' (integer),
- height' (float).

2. Type Casting:

Perform type casting between different data types using type conversion functions (int(), str(), float(), bool())

Example:

- Convert an integer variable **x** to a float and print the result.
- Convert an string value **'22'** to a integer and print the result.
- Convert an float value **20.56** to a integer and print the result

3. Arithmetic Operations:

Create variables **a** and **b** and perform arithmetic operations (addition, subtraction, multiplication, division, modulo) on them. Print the results of each operation.

1. FORMULA USED FUNCTION
   - Area of Circle
   - Area of Triangle
   - Area of Cylinder
   - Area of Trapezium

2. CONVERSATION
   - KM to Miles & Miles to KM
   - Celsius to Fahrenheit & Fahrenheit to Celsius.

4. IF CONDITION:

- **Number Comparison**:

  Write a program that asks the user for two numbers and prints whether the first number is greater than, less than, or equal to the second number.

- **Even or Odd**:

  Write a program that asks the user for an integer and prints whether it's even or odd using an if statement.

- **Age Classifier:**

  Write a program that asks the user for their age and prints whether they are a child (0-12 years), teenager (13-19 years), adult (20-64 years), or senior (65+ years).

- **Grade Calculator:**

  Write a program that asks the user for their grade percentage and prints their corresponding letter grade according to the following scale:

  - A: 90-100%
  - B: 80-89%
  - C: 70-79%
  - D: 60-69%
  - F: Below

- **Leap Year Checker:**

  Write a program that asks the user for a year and prints whether it's a leap year or not. A leap year is divisible by 4, but not divisible by 100 unless it is also divisible by 400.

- **Vowel or Consonant:**

  Write a program that asks the user for a single character and prints whether it's a vowel or a consonant. Assume the input is a lowercase letter.

- **Positive, Negative, or Zero**:

  Write a program that asks the user for a number and prints whether it's positive, negative, or zero.

- **Password Validator:**

  Write a program that asks the user to enter a password If the length of the password is less than 8 characters, print a message indicating that the password is too short. Otherwise, print a message indicating that the password is valid.

- **ACCOUNT LOGIN:**

  us = ‘arun’

  pw = ‘arun123’

  Write a program that asks the user to enter a username and password. Compare the variables **'us'** and **'pw**' with the provided values. If the conditions match, print "Login successful"; otherwise, print "Login Failed".

5. FOR LOOP:

- **Print Numbers:**

  Write a program that uses a "for" loop to print numbers from 10 to 35.

- **Sum of Numbers:**

  Write a program that calculates and prints the sum of all numbers from 1 to 10.

- **Print Even Numbers:**

  Write a program that uses a for loop to print all even numbers between 1 and 20.

- **Print Odd Numbers:**

  Write a program that uses a for loop to print all odd numbers between 1 and 20.

- **Print Multiplication Table:**

  Write a program that prompts the user to enter a number and then prints the multiplication table for that number from 1 to 10.

- **Factorial Calculator:**

  Write a program that calculates the factorial of a number entered by the user. The factorial of a non-negative integer n is the product of all positive integers less than or equal to n. For example, the factorial of 5 (written as 5!) is 5 * 4 * 3 * 2 * 1.

- **Reverse String**:

  Write a program that takes a string as input and prints it in reverse order.

- **Count Vowels:**
  Write a program that counts the number of vowels (a, e, i, o, u) in a given string.

- **Print Pattern:**
  Write a program that prints the following pattern using nested for •loops:

1:	2:
* * * * * * * * * * * * * * *	* * * * * * * * * * * * * * *

3:	4:
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *	* * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

5:	6:
*	* * * * *

* * * * * * * * * * * * * *	* * * * * * * * * *

7:

```
    *
   * *
  * * *
 * * * *
* * * * *
 * * * *
  * * *
   * *
    *
```


6. WHILE LOOP:

- **Print Numbers:**
  Write a program that uses a "for" loop to print numbers from 10 to 35.

- **Sum of Numbers:**
  Write a program that calculates and prints the sum of all numbers from 1 to 10.

- **Print Even Numbers:**
  Write a program that uses a for loop to print all even numbers between 1 and 20.

- **Print Odd Numbers:**
  Write a program that uses a for loop to print all odd numbers between 1 and 20.

- **Print Multiplication Table:**
  Write a program that prompts the user to enter a number and then prints the multiplication table for that number from 1 to 10.

- **Factorial Calculator:**

Write a program that calculates the factorial of a number entered by the user. The factorial of a non-negative integer n is the product of all positive integers less than or equal to n. For example, the factorial of 5 (written as 5!) is 5 * 4 * 3 * 2 * 1.

- **Password Checker:**
  Write a program that prompts the user to enter a password. Keep prompting the user until they enter the correct password, which you define in the program.

7. LIST:

- **Print Elements:**
  Write a program that creates a list of integers and prints each element of the list.

- **List Manipulation**:
  Write a program that performs various list manipulation operations such as appending, inserting and removing elements from a list.

- **Find Index:**
  Find the index of the first occurrence of a specific element in a list using the index() method.

- **Count Occurrences:**
  Count the number of occurrences of a specific element in a list using the count() method.

- **Sum of Elements:**
  Write a program that calculates and prints the sum of all elements in a list of numbers.

- **Maximum and Minimum:**
  Write a program that finds and prints the maximum and minimum elements in a list of numbers.

- **Average Calculator:**
  Write a program that calculates and prints the average of all elements in a list of numbers.

- **Remove Duplicates:**

Write a program that removes duplicate elements from a list and prints the updated list.

- **List Comprehension:**
  Use list comprehension to create a new list containing only the even numbers from an existing list of integers.

- **Merge Lists:**
  Write a program that takes two lists as input and merges them into a single list, removing any duplicates.

- **Sort List:**
  Write a program that takes a list of numbers and sorts it in ascending and descending order.

- **List Slicing:**
  Write a program that demonstrates list slicing by extracting a sublist from a given list.

- **List Concatenation:**
  Write a program that concatenates two lists and prints the resulting list.

8. **TUPLE:**

- **Tuple Creation:**
  Create tuples with different elements, including integers, strings, floats, and other tuples.

- **Access Tuple Elements:**
  Access individual elements of tuples using indexing and slicing.

- **Casting:**
  Casting Tuple to List

9. SET:

- **Set Operations:**
  Write a program that demonstrates various set operations such as add(), remove(), discard(), clear(), update( ) , intersection(), difference() , and symmetric_difference ( ).

10. DICTIONARY:

- **Create Dictionary:**
  Write a program that creates a dictionary representing a person, including keys for first name, last name, age, and city. Print the dictionary.

- **Access Dictionary Elements:**
  Write a program that creates a dictionary of your favorite foods with their prices. Print the price of one of your favorite foods.

- **Add and Modify Dictionary Elements:**

  Write a program that creates an empty dictionary representing a shopping list. Add items to the dictionary with their quantities. Modify the quantity of one of the items.