# **Assignments**

| 1. Accept a char input from the user and display it on the console. |
| --- |
| *character = input("Enter a character:")*  *print(character[0])* |
| 1. Accept two inputs from the user and output its sum.  | **Variable** | **Data Type** | | --- | --- | | Number 1 | Integer | | Number 2 | Float | | Sum | Float | |
| number1 = int(input("Enter number1:"))  number2 = float(input("Enter number2:"))  sum = number1+number2  print(f"The sum is {sum}") |
| 1. Write a program to find the simple interest.    1. Program should accept 3 inputs from the user and calculate simple interest for the given inputs. Formula: SI=(P\*R\*n)/100)  | **Variable** | **Data Type** | | --- | --- | | Principal amount (P) | Integer | | Interest rate (R) | Float | | Number of years (n) | Float | | Simple Interest (SI) | Float | |
| principal\_amount=int(input("Enter principal amount :"))  interest\_rate=float(input("Enter interest rate : "))  number\_of\_years=float(input("Enter number of years : "))  simple\_interest=(principal\_amount\*interest\_rate\*number\_of\_years)/100  print(f"The calculated simple interest is {simple\_interest}") |
| 1. Write a program to check whether a student has passed or failed in a subject after he or she enters their mark (pass mark for a subject is 50 out of 100). 2. Program should accept an input from the user and output a message as “Passed” or “Failed”  | **Variable** | **Data type** | | --- | --- | | mark | float | |
| mark = float(input("Enter your marks : "))  *if* 50 <= mark <= 100:  print("You have passed")  *elif* 50 > mark >= 0:  print("You have failed")  *else*:  print("Enter valid mark") |
| 1. Write a program to show the grade obtained by a student after he/she enters their total mark percentage. 2. Program should accept an input from the user and display their grade as follows  | **Mark** | **Grade** | | --- | --- | | > 90 | A | | 80-89 | B | | 70-79 | C | | 60-69 | D | | 50-59 | E | | < 50 | Failed |  | **Variable** | **Data type** | | --- | --- | | Total mark | float | |
| marks = float(input("Enter your marks : "))  *if* 100 >= marks >= 90:  print("Grade A")  *elif* 89 >= marks >= 80:  print("Grade B")  *elif* 79 >= marks >= 70:  print("Grade C")  *elif* 69 >= marks >= 60:  print("Grade D")  *elif* 59 >= marks >= 50:  print("Grade E")  *elif* 0 <= marks < 50:  print("Failed")  *else*:  print("Invalid mark") |
| 1. Using the ‘switch case’ write a program to accept an input number from the user and output the day as follows.  | **Input** | **Output** | | --- | --- | | 1 | Sunday | | 2 | Monday | | 3 | Tuesday | | 4 | Wednesday | | 5 | Thursday | | 6 | Friday | | 7 | Saturday | | Any other input | Invalid Entry | |
| number = int(input("Enter the number : "))  *match* number:  *case* 1:  print("Sunday")  *case* 2:  print("Monday")  *case* 3:  print("Tuesday")  *case* 4:  print("Wednesday")  *case* 5:  print("Thursday")  *case* 6:  print("Friday")  *case* 7:  print("Saturday")  *case* \_:  print("Invalid entry") |
| 1. Write a program to print the multiplication table of given numbers. 2. Accept an input from the user and display its multiplication table   Eg:  **Output**: Enter a number  **Input**: 5  **Output**:  1 x 5 = 5  2 x 5 = 10  3 x 5 = 15  4 x 5 = 20  5 x 5 = 25  6 x 5 = 30  7 x 5 = 35  8 x 5 = 40  9 x 5 = 45  10 x 5 = 50 |
| number=int(input("Enter a number"))  *for* i *in* range(1,11):  product = number\*i  print(f"{number}\*{i}={product}") |
| 1. Write a program to find the sum of all the odd numbers for a given limit 2. Program should accept an input as limit from the user and display the sum of all the odd numbers within that limit   For example if the input limit is 10 then the result is 1+3+5+7+9 = 25  **Output**: Enter a limit  **Input**: 10  **Output**: Sum of odd numbers = 25 |
| number = int(input("Enter a number"))  sum = 0  *for* i *in* range(1, number + 1):  *if* i % 2 == 1:  sum = sum + i  print(f"The sum of odd numbers is {sum}") |
| 1. Write a program to print the following pattern (**hint**: use nested loop)   1  1 2  1 2 3  1 2 3 4  1 2 3 4 5 |
| number = int(input("Enter the number : "))  *for* i *in* range(1, number+1):  *for* j *in* range(1, i+1):  print(j, end=" ")  print() |
| 1. Write a program to interchange the values of two arrays. 2. Program should accept an array from the user, swap the values of two arrays and display it on the console   Eg: **Output**: Enter the size of arrays  **Input**: 5  **Output**: Enter the values of Array 1  **Input**: 10, 20, 30, 40, 50  **Output**: Enter the values of Array 2  **Input**: 15, 25, 35, 45, 55  **Output**: Arrays after swapping:  Array1: 15, 25, 35, 45, 55  Array2: 10, 20, 30, 40, 50 |
| size=int(input("Enter the size of array:"))  array1=[]  array2=[]  print("Enter the values of Array1")  *for* i *in* range(0,size):  array1.append(input())  print("Enter the values of Array2")  *for* i *in* range(0,size):  array2.append(input())  print("First array")  *for* i *in* array1:  print(i,end=" ")  print("\nSecond array")  *for* i *in* array2:  print(i,end=" ")  *for* i *in* range(0,size):  temp=array1[i]  array1[i]=array2[i]  array2[i]=temp  print("\nAfter swapping")  print("Array 1")  *for* i *in* array1:  print(i,end=" ")  print("\nArray 2")  *for* i *in* array2:  print(i,end=" ") |
| 1. Write a program to find the number of even numbers in an array 2. Program should accept an array and display the number of even numbers contained in that array   Eg: **Output**: Enter the size of an array  **Input**: 5  **Output:** Enter the values of array  **Input:** 11, 20, 34, 50, 33  **Output:** Number of even numbers in the given array is 3 |
| size=int(input("Enter the size of array"))  array=[]  count=0  *for* i *in* range(0,size):  array.append(int(input()))  *for* i *in* array:  *if* i%2==0:  count+=1  print(f"The number of even numbers in the given array is {count}") |
| 1. Write a program to sort an array in descending order 2. Program should accept and array, sort the array values in descending order and display it   Eg: **Output**: Enter the size of an array  **Input**: 5  **Output**: Enter the values of array  **Input**: 20, 10, 50, 30, 40  **Output**: Sorted array:  50, 40, 30, 20, 10 |
| size = int(input("Enter the size of array"))  array = []  *for* i *in* range(0, size):  array.append(int(input()))  *for* i *in* range(0, size - 1):  *for* j *in* range(i+1, size):  *if* array[i] < array[j]:  array[i], array[j] = array[j], array[i]  print("The sorted array is")  print(array) |
| 1. Write a program to identify whether a string is a palindrome or not 2. A string is a palindrome if it reads the same backward or forward eg: MALAYALAM   Program should accept a string and display whether the string is a palindrome or not  Eg: **Output**: Enter a string  **Input**: MALAYALAM  **Output**: Entered string is a palindrome  Eg 2: **Output**: Enter a string  **Input**: HELLO  **Output**: Entered string is not a palindrome |
| string = input("Enter a string")  flag = 0  length = len(string)  *for* i *in* range(0, length):  *if* string[i] != string[length - 1 - i]:  flag = 1  *break*  *if* flag == 0:  print("Entered string is a palindrome")  *else*:  print("Entered string is not a palindrome") |
| 1. Write a program to add to two dimensional arrays 2. Program should accept two 2D arrays and display its sum   Eg: **Output**: Enter the size of arrays  **Input**: 3  **Output**: Enter the values of array 1  **Input**:  1 2 3  4 5 6  7 8 9  **Output**: Enter the values of array 2  **Input**:  10 20 30  40 50 60  70 80 90  **Output**: Sum of 2 arrays is:  11 22 33  44 55 66  77 88 99 |
| size = int(input("Enter the size of arrays"))  array1 = []  array2 = []  print("Enter the values of Array 1")  *for* i *in* range(size):  row = [] \* size  *for* j *in* range(size):  row.append(int(input()))  array1.append(row)  print("Array 1")  *for* i *in* range(size):  *for* j *in* range(size):  print(array1[i][j], end=" ")  print()  print("Enter the values of Array 2")  *for* i *in* range(size):  row = [] \* size  *for* j *in* range(size):  row.append(int(input()))  array2.append(row)  print("Array 2")  *for* i *in* range(size):  *for* j *in* range(size):  print(array2[i][j], end=" ")  print()  print("The sum of 2 Arrays is")  *for* i *in* range(size):  *for* j *in* range(size):  sum = array1[i][j] + array2[i][j]  print(sum, end=" ")  print() |
| 1. Write a program to accept an array and display it on the console using functions 2. Program should contain 3 functions including main() function   **main()**   1. Declare an array 2. Call function getArray() 3. Call function displayArray()   **getArray()**   1. Get values to the array   **displayArray()**   1. Display the array values |
| size = int(input("Enter the size of array"))  array = [] \* size  *def* get\_array():  print("Enter the elements of array")  *for* i *in* range(size):  array.append(input())  *def* display\_array():  print("The array is ")  *for* i *in* array:  print(i, end=" ")  get\_array()  display\_array() |
| 1. Write a program to check whether a given number is prime or not 2. Program should accept an input from the user and display whether the number is prime or not   Eg: **Output**: Enter a number  **Input**: 7  **Output**: Entered number is a Prime number |
| number = int(input("Enter a number: "))  flag = 0  *if* number == 0 *or* number == 1:  flag = 1  *for* i *in* range(2, number):  *if* number % i == 0:  flag = 1  *if* flag == 1:  print("The number is not prime")  *else*:  print("The number is prime") |
| 1. Write a menu driven program to do the basic mathematical operations such as addition, subtraction, multiplication and division (**hint**: use if else ladder or switch) 2. Program should have 4 functions named addition(), subtraction(), multiplication() and division() 3. Should create a class object and call the appropriate function as user prefers in the main function |
| *class* MathOperation:  *def* addition(*self*, x, y):  *return* x + y  *def* subtraction(*self*, x, y):  *return* x - y  *def* multiplication(*self*, x, y):  *return* x \* y  *def* division(*self*, x, y):  *return* x / y  operation = MathOperation()  print("1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n")  inp = int(input("Enter the option : "))  number1 = int(input("Enter first number"))  number2 = int(input("Enter second number"))  result = 0  *match* inp:  *case* 1:  result = operation.addition(number1, number2)  *case* 2:  result = operation.subtraction(number1, number2)  *case* 3:  result = operation.multiplication(number1, number2)  *case* 4:  result = operation.division(number1, number2)  *case* \_:  print("Invalid Entry")  print(f"The result is {result}") |
| 1. Grades are computed using a weighted average. Suppose that the written test counts 70%, lab exams 20% and assignments 10%.   If Arun has a score of  Written test = 81  Lab exams = 68  Assignments = 92  Arun’s overall grade = (81x70)/100 + (68x20)/100 + (92x10)/100 = 79.5  Write a program to find the grade of a student during his academic year.   * 1. Program should accept the scores for written test, lab exams and assignments   2. Output the grade of a student (using weighted average)   Eg:  Enter the marks scored by the students  Written test = 55  Lab exams = 73  Assignments = 87  Grade of the student is 61.8 |
| print("Enter the marks scored by the students")  written\_test=int(input("Written test= "))  lab\_exam=int(input("lab exam= "))  assignment=int(input("Assignment= "))  overall\_grade=(written\_test\*0.7)+(lab\_exam\*0.2)+(assignment\*0.1)  print(f"Grade of the student is {overall\_grade}") |
| 1. Income tax is calculated as per the following table  | **Annual Income** | **Tax percentage** | | --- | --- | | Up to 2.5 Lakhs | No Tax | | Above 2.5 Lakhs to 5 Lakhs | 5% | | Above 5 Lakhs to 10 Lakhs | 20% | | Above 10 Lakhs to 50 Lakhs | 30% |   Write a program to find out the income tax amount of a person.   1. Program should accept annual income of a person   Output the amount of tax he has to pay  Eg 1:  Enter the annual income  495000  Income tax amount = 24750.00  Eg 2:  Enter the annual income  500000  Income tax amount = 25000.00 |
| income=int(input("Enter the annual income"))  *if* income<=250000:  print("You have to pay no tax")  *elif* 250000<income<=500000:  tax=income\*0.05  print(f"Income tax amount = {tax}")  *elif* 500000<income<=1000000:  tax=income\*0.2  print(f"Income tax amount = {tax}")  *elif* 1000000<income<=5000000:  tax=income\*0.3  print(f"Income tax amount = {tax}")  *else*:  print("Contact Income tax") |
| 1. Write a program to print the following pattern using for loop   1  2 3  4 5 6  7 8 9 10 |
| num = 1  row = int(input("Enter no of rows:"))  *for* i *in* range(1, row + 1):  *for* j *in* range(1, i + 1):  print(num, end=" ")  num = num + 1  print() |
| 1. Write a program to multiply the adjacent values of an array and store it in an another array    1. Program should accept an array    2. Multiply the adjacent values    3. Store the result into another array   Eg:  Enter the array limit  5  Enter the values of array  1 2 3 4 5  Output  2 6 12 20 |
| size=int(input("Enter the size of array"))  array=[]\*size  result=[]\*(size)  print("Enter the values of array")  *for* i *in* range(size):  array.append(int(input()))  *for* i *in* range(size-1):  result.append(array[i]\*array[i+1])  print("Output")  *for* i *in* result:  print(i,end=" ") |
| 1. Write a program to add the values of two 2D arrays 2. Program should contains 3 functions including the main function   **main()**   1. Call function getArray() 2. Call function addArray() 3. Call function displayArray()   **getArray()**   1. Get values to the array   **getArray()**   1. Add array 1 and array 2   **displayArray()**   1. Display the array values   Eg:  Enter the size of array  2  Enter the values of array 1  1 2  3 4  Enter the values of array 2  5 6  7 8  Output:  Sum of array 1 and array 2:  6 8  10 12 |
| array1 = []  array2 = []  size = int(input("Enter the size of array"))  *def* get\_array():  print("Enter the values of Array 1")  *for* i *in* range(size):  row=[]\*size  *for* j *in* range(size):  row.append(int(input()))  array1.append(row)  print("Enter the values of Array 2")  *for* i *in* range(size):  row=[]\*size  *for* j *in* range(size):  row.append(int(input()))  array2.append(row)  *def* display\_array():  print("The first array")  *for* i *in* range(size):  *for* j *in* range(size):  print(array1[i][j],end=" ")  print()  print("The second array")  *for* i *in* range(size):  *for* j *in* range(size):  print(array2[i][j], end=" ")  print()  *def* add\_array():  print("Sum of Array 1 and Array 2")  *for* i *in* range(size):  *for* j *in* range(size):  sum=array1[i][j]+array2[i][j]  print(sum,end=" ")  print()  get\_array()  display\_array()  add\_array() |
| 1. Write an object oriented program to store and display the values of a 2D array    1. Program should contains 3 functions including the main function   **main()**   1. Declare an array 2. Call function getArray() 3. Call function displayArray()   **getArray()**   1. Get values to the array   **displayArray()**   1. Display the array values   Eg:  Enter the size of array  3  Enter the array values  1 2 3  4 5 6  7 8 9  Array elements are:  1 2 3  4 5 6  7 8 9 |
| array = []  size = int(input("Enter the size of array"))  *class* ArrayFunction:  *def* get\_array(*self*):  print("Enter the values of Array ")  *for* i *in* range(size):  row = [] \* size  *for* j *in* range(size):  row.append(int(input()))  array.append(row)  *def* display\_array(*self*):  print("Array elements are")  *for* i *in* range(size):  *for* j *in* range(size):  print(array[i][j], end=" ")  print()  array\_operation=ArrayFunction()  array\_operation.get\_array()  array\_operation.display\_array() |
| 1. Write a menu driven program to calculate the area of a given object.    1. Program should contain two classes       1. Class 1: MyClass       2. Class 2: Area    2. Class MyClass should inherit class Area and should contain the following functions       1. main()       2. circle()       3. square()       4. rectangle()   triangle()   * 1. Class Area should contain the following functions to calculate the area of different objects      1. circle()      2. square()      3. rectangle()      4. triangle()   Class MyClass extends Area{  public static void main(string args[]){  }  circle() {  }  square() {  }  rectangle() {  }  triangle() {  }  }  Class Area{  circle(){  }  square(){  }  rectangle() {  }  triangle() {  }  }  Eg 1:  Enter your choice   1. Circle 2. Square 3. Rectangle 4. Triangle   2  Enter the length  2  Output  Area of the square is: 4  Eg 2:  Enter your choice   1. Circle 2. Square 3. Rectangle 4. Triangle   1  Enter the radius  3  Output  Area of the circle is: 28.26 |
| *class* Area:  *def* circle(*self*):  radius=int(input("Enter the radius\n"))  area=3.14\*radius\*radius  print(f"The area of circle is {area}")  *def* square(*self*):  length=int(input("Enter the length of square\n"))  area=length\*length  print(f"The area of square is {area}")  *def* rectangle(*self*):  length=int(input("Enter the length\n"))  breadth=int(input("Enter the breadth\n"))  area=length\*breadth  print(f"The area of rectangle is {area}")  *def* triangle(*self*):  base=int(input("Enter the base\n"))  height=int(input("Enter the height\n"))  area=0.5\*base\*height  print(f"The area of triangle is {area}")  *class* MyClass(Area):  *pass*  myclass=MyClass()  choice=int(input("Enter your choice\n1.Circle\n2.Square\n3.Rectangle\n4.Triangle\n"))  *match* choice:  *case* 1:  myclass.circle()  *case* 2:  myclass.square()  *case* 3:  myclass.rectangle()  *case* 4:  myclass.triangle()  *case* \_:  print("Invalid Entry") |