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**SECTION : G**

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| Program 1 | Suppose a person wants to calculate the simple interest for the account he has taken for specified number of years.(read the values from user) |
|  | **Algorithm:**  **Step1: Start**  **Step2: Read value of principal rate and time**  **Step3: si = (p\*r\*t)/100**  **Step4: Print value of si**  **Step5: End** |
|  | **Program with appropriate Comments:**  **"""**  **To find the simple interest for given inputs by the user**  **"""**  **#read the values of principal amount, rate and time from the user**  **p = float(input("Enter the value for principal amount"))**  **r = float(input("Enter the value for rate"))**  **t = int(input("Enter the number of years"))**  **si = (p\*r\*t)/100 #formula to calculate the simple interest**  **print("The simple interest for the principal amount",p,**  **"for rate",r,"years",t,"is equal to",si)** |
|  | **Out Put Screen shot:** |
| Program 2 | **Accept name, roll number and field of interest from user and print in the below format : my name is abc and my roll number is 123. My field of interest is abc.** |
|  | **Algorithm:**  **Step1: Start**  **Step2: Read values for name, roll number and field of interest**  **Step3: Print the value of name, roll number and field of interest**  **Step4: End** |
|  | **Program with appropriate Comments:**  **"""**  **Accept name, roll number and field of interest from user and print**  **in the below format : my name is abc and my roll number is 123. My**  **field of interest is abc.**  **"""**  **#read value of name, roll number and field of interest**  **name = input("Enter the name of the person ")**  **roll\_no = input("Enter the roll number of the person ")**  **field\_of\_interest = input("Enter the field of interest of the person ")**  **print("My name is",name,"and my roll number is",roll\_no,**  **"My field of interest is",field\_of\_interest)** |
|  | **Out Put Screen shot:** |
| Program 3 | Write a Python program which accepts the radius of a sphere and computes the volume. What is the volume and surface area of a sphere? The volume of a sphere with radius r is 4/3 πr3 . |
|  | **Algorithm:**  **Step1: Start**  **Step2: Read the radius of the sphere**  **Step3: volume = (4/3)\*3.14\*radius\*\*3**  **Step4: surface\_area = 4\*3.14\*radius\*\*2**  **Step5: Print the value of volume and surface area of the sphere**  **Step6: End** |
|  | **Program with appropriate Comments:**  **"""**  **Write a Python program which accepts the radius of a sphere and computes**  **the volume and surface area of a sphere.**  **"""**  **radius = float(input("Enter the value of radius of a sphere "))**  **volume = (4/3)\*3.14\*radius\*\*3 #formula to compute volume of sphere**  **surface\_area = 4\*3.14\*radius\*\*2 #formula to compute surface area of sphere**  **print("The volume of the sphere of radius ",radius,"is {:.2f}".format(volume))**  **print("The surface area of the sphere of radius",radius,"is {:.2f}".format(surface\_area))** |
|  | **Out Put Screen shot:** |
| Program 4 | Python Program to Find the Gravitational Force Acting Between Two Objects |
|  | **Algorithm:**  **Step1: Start**  **Step2: Read the value of mass of object 1 and 2**  **Step3: Read the value of the distance between them**  **Step4: Set value of g = 6.67\*10\*\*-11**  **Step5: Calculate value of force, f = (g\*(mass1\*mass2))/(distance)\*\*2**  **Step6: Print the value of force between the two objects**  **Step7: End** |
|  | **Program with appropriate Comments:**  **"""**  **Python Program to Find the Gravitational Force Acting Between Two Objects**  **"""**  **#read values of mass of object 1 and 2 and the distance between them**  **mass1 = float(input("Enter the value of mass of object 1 "))**  **mass2 = float(input("Enter the value of mass of object 2 "))**  **distance = float(input("Enter the distance between the two objects "))**  **g = 6.67\*10\*\*-11 #value of constant g**  **f = (g\*(mass1\*mass2))/(distance)\*\*2 #formula to calculate the gravitational force**  **print("The gravitational force acting between the two objects is",f)** |
|  | **Out Put Screen shot:** |
| Program 5 | Write a program to read 4 characters separately from the user. Convert every character to its next alphabet. |
|  | **Algorithm:**  **/\* incrementing the value of character1,character2,character3 and character4**  **to the next character \*/**  **Step1: Start**  **Step2: Read the value of character1, character2, character3 and character4**  **Step3: character1 = character1 + 1**  **Step4: character2 = character2 + 1**  **Step5: character3 = character3 + 1**  **Step6: character4 = character4 + 1**  **Step7: Print the values of character1, character2, character3 and character4**  **Step8: End** |
|  | **Program with appropriate Comments:**  **"""**  **Write a program to read 4 characters separately from the user. Convert**  **every character to its next alphabet.**  **"""**  **#reading the value of 4 characters**  **character1 = input("Enter any character ")**  **character2 = input("Enter any character ")**  **character3 = input("Enter any character ")**  **character4 = input("Enter any character ")**  **#incrementing the value of character1,character2,character3 and character4**  **#to the next character**  **character1 = chr(ord(character1)+1)**  **character2 = chr(ord(character2)+1)**  **character3 = chr(ord(character3)+1)**  **character4 = chr(ord(character4)+1)**  **print("The incremented four characters are",character1,character2,character3,**  **character4)** |
|  | **Out Put Screen shot:** |
| Program 6 | Write a program to Swap the contents of two memory locations using bitwise XOR operation.  Note: Do not use either temporary variable or arithmetic operators. |
|  | **Algorithm:**  **Step1: Start**  **Step2: Read value of two variables a and b**  **Step3: Print the value of variables before swapping**  **Step4: a = a^b**  **Step5: b = a^b**  **Step6: a = b^a**  **Step7: Print the value of variables after swapping**  **Step8: End** |
|  | **Program with appropriate Comments:**  **"""**  **Program to Swap the contents of two memory locations using bitwise**  **XOR operation.**  **"""**  **a = int(input("Enter the value of a "))**  **b = int(input("Enter the value of b "))**  **print("The value of a and b before swapping are",a,b,"respectively")**  **a = a^b**  **b = a^b**  **a = b^a**  **print("The value of a and b after swapping are",a,b,"respectively")** |
|  | **Out Put Screen shot:** |
| Program 7 | Suppose the cover price of a book is $24.95, but bookstores get a 40% discount. Shipping costs $3 for the first copy and 75 cents for each additional copy. What is the total wholesale cost for 60 copies? |
|  | **Algorithm:**  **Step1: Start**  **Step2: Read the number of books (input 60)**  **Step3: Set value of coverprice = 24.95**  **Step4: Compute the discount (40%) for the coverprice**  **Step5: Compute total price of 60 books,**  **total\_price = (coverprice-(coverprice\*0.4))\*number+(3+(number-1)\*0.75)**  **Step6: Print the value of the total\_price**  **Step7: End** |
|  | **Program with appropriate Comments:**  **"""**  **Suppose the cover price of a book is $24.95, but bookstores get a 40%**  **discount. Shipping costs $3 for the first copy and 75 cents for each**  **additional copy. What is the total wholesale cost for 60 copies?**  **"""**  **#read the number of books**  **number = int(input("Enter the number of books to be shipped "))**  **coverprice = 24.95 #defining the cover price of each copy**  **#computing total price of the 60 books**  **total\_price = (coverprice-(coverprice\*0.4))\*number+(3+(number-1)\*0.75)**  **print("The total wholesale cost of",number,"number of books is equal to ${:.2f}"**  **.format(total\_price))** |
|  | **Out Put Screen shot:** |
| Program 8 | If person leave house at 6:52 am and run 1 mile at an easy pace (8:15 per mile), then 3 miles at tempo (7:12 per mile) and 1 mile at easy pace again, what time do the person get home for breakfast? |
|  | **Algorithm:**  **Step1: Start**  **Step2: Set value of start\_timehour and start\_timeminute**  **Step3: Convert running time into seconds**  **Step4: Calculate total running time in seconds**  **time\_inseconds = easy\_pace\*2 + tempo\_pace\*3**  **Step5: Calculate running time in minutes, minutes = time\_inseconds/60**  **Step6: Calculate remaining time in seconds**  **Step7: Add minutes and seconds to the value of start\_timehour and start\_timeminute**  **Step8: Print when the man will be home for breakfast**  **Step9: End** |
|  | **Program with appropriate Comments:**  **"""**  **If a person leaves his house at 6:52 am and runs 1 mile at an easy pace**  **(8:15 per mile), then 3 miles at tempo (7:12 per mile) and 1 mile at**  **easy pace again, what time do the person get home for breakfast?**  **"""**  **#defining the time the person left home**  **start\_timehour = 6**  **start\_timeminute = 52**  **#converting hours and minutes into seconds**  **easy\_pace = 8\*60+15**  **tempo\_pace = 7\*60+12**  **#total running time in seconds**  **time\_inseconds = easy\_pace\*2 + tempo\_pace\*3**  **#total running time in minutes**  **minutes = time\_inseconds//60**  **#remaining time in seconds**  **seconds = time\_inseconds%60**  **end\_minutes = start\_timeminute + minutes #calculating total minutes**  **end\_timehour = start\_timehour + end\_minutes//60**  **end\_minutes = end\_minutes%60**  **str1="The person will be home at "+str(end\_timehour)+':'+str(end\_minutes)+':'+str(seconds)+' AM'**  **print(str1)** |
|  | **Out Put Screen shot:** |
| Program 9 | Python Program to Clear the Rightmost Set Bit of a Number |
|  | **Algorithm:**  **/\* right shifting the value of a will shift the rightmost bit and left shifting value will bring back all bits to original position. Hence the last bit would be cleared \*/**  **Step1: Start**  **Step2: Read the value of a number in variable a**  **Step3: b = a >> 1**  **Step4: b = b << 1**  **Step5: print b**  **Step6: End** |
|  | **Program with appropriate Comments:**  **"""**  **Python Program to Clear the Rightmost Set Bit of a Number**  **"""**  **#read a value of a number**  **a = int(input("Enter the value of a number whose rightmost bit needs to be cleared: "))**  **print("The binary value of",a,"is",bin(a))**  **b = a>>1 #right shifting the value of a to shift all bits to the right**  **b = b<<1 #left shifting value of b to bring back all bits to original position**  **print("Binary value of the number after clearing the rightmost bit is",bin(b))** |
|  | **Out Put Screen shot:** |
| Program 10 | Write a Python program  A) To get a single random character from a specified string.  B) Write a program to:  i) shuffle students in a class. (Assume no of students in a class are 10)  ii) to choose one student who would become a Class representative.  iii) to create a random sample of size 2 from the available number of population who are the potential candidates to become event coordinators.  C) Calculate multiplication of two random float numbers  D) To generate a floating-point number within a range.  E) Generates a random integer number from the given range.  F) To generate the same random number every time.  G) Roll a dice in such a way that every time you get the same number. |
|  | **Algorithm:** |
|  | **Program with appropriate Comments:**  **import random**  **#A) To get a single random character from a specified string.**  **x = input("Enter a string ")**  **print(random.choice(x))**  **#B) Let students in the class be represented by roll numbers from 1 to 10**  **# i) shuffle students in a class. (Assume no of students in a class are 10)**  **students = [1,2,3,4,5,6,7,8,9,10]**  **(random.shuffle(students))**  **print(students)**  **# ii) to choose one student who would become a Class representative**  **print(random.choice(students))**  **# iii) to create a random sample of size 2 from the available number of population who are #the potential candidates to become event coordinators.**  **print(random.sample(students,2))**  **#C) Calculate multiplication of two random float numbers**  **f1 = (random.random())**  **f2 = (random.random())**  **f = f1\*f2**  **print(f)**  **#D) To generate a floating-point number within a range.**  **x = int(input("Enter the start range "))**  **y = int(input("Enter the end range "))**  **print(random.uniform(x,y))**  **#E) Generates a random integer number from the given range.**  **a = int(input("Enter the start range "))**  **b = int(input("Enter the end range "))**  **print(random.randint(a,b))**  **#F) To generate the same random number every time.**  **random.seed(3)**  **print(random.randint(1,10))**  **random.seed(3)**  **print(random.randint(1,10))**  **#F using for loop**  **for i in range(2):**  **random.seed(3)**  **print(random.randint(1,10))**  **#G) Roll a dice in such a way that every time you get the same number.**  **x = int(input("Enter the number of times the dice should be rolled "))**  **for i in range(x):**  **random.seed(3)**  **print(random.randint(1,6))** |
|  | **Out Put Screen shot:** |