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Section: G

Program 1	Create a program that has two parameters namely name and their age. Print out a message addressed to them that tells them the year that they will turn 100 years old.
	Algorithm: **Step1: Start** **Step2: Read the values of name** **Step3: Read the value of age** **Step4: Calculate year the person turns 100 using the formula** **year=2020+(100-age)** **Step5: Print the value of year** **Step6: End**

	Program with appropriate Comments
	*program1_name&age.py - D:\PES\Semester 1\Computer Science- Python Programming\PythonL
	File Edit Format Run Options Window Help
	`"""`
	`Purpose:Program that has two parameters namely name and their age.`
	`And that tells them the year that they will turn 100 years old.`
	`"""`
	
	`print("What is your name? ")`
	`name=input()`
	`print("What is your age? ")`
	`age=int(input())`
	
	`#calculate the year the person will be 100 years old`
	`#assume the current year is 2020`
	`year=2020+(100-age)`
	
	`print(name," will be 100 years old in the year ",year)`

	Out Put Screen shot:

	C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program1_nameage.py What is your name? supreetha What is your age? 29 supreetha will be 100 years old in the year 2091 C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program1_nameage.py What is your name? naren What is your age? 18 naren will be 100 years old in the year 2102 C:\Users\Naren\AppData\Local\Programs\Python\Python39>
Program 2	N students take K apples and distribute them among each other evenly. The remaining (the undivisible) part remains in the basket. How many apples will each single student get? How many apples will remain in the basket?The program reads the numbers N and K. It should print the two answers for the questions above.
	Algorithm: **Step1: Start** **Step2: Read the value of number of students in n** **Step3: Read the value of number of apples in k** **Step4: Calculate number of apples each student gets using the formula** **v= k / n** **Step5: Calculate the remaining number of apples if any, using the formula** **r= k % n** **Step6: Print the value of v-number of apples each student gets** **Step7: Print the value of r-number of remaining apples** **Step7: End**
	Program with appropriate Comments:

program2_apples.py - D:\PES\Semester 1\Computer Science- Python Programming\PythonL...

File Edit Format Run Options Window Help

```
"""
Purpose: Python program for the problem statement -
N students take K apples and distribute them among each other evenly.
The remaining (the undivisible) part remains in the basket. How many
apples will each single student get? How many apples will remain in
the basket?
"""
n = int(input("Enter the number of students "))
k = int(input("Enter the number of apples "))

v = k//n #number of apples each student will get
r = k%n #number of remaining apples

print("Number of apples each student gets = ",v)
print("Number of remaining apples = ",r)
```

Out Put Screen shot:

```
C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program2_apples.py
Enter the number of students 6
Enter the number of apples 50
Number of apples each student gets =  8
Number of remaining apples =  2

C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program2_apples.py
Enter the number of students 9
Enter the number of apples 30
Number of apples each student gets =  3
Number of remaining apples =  3
```

Program 3	Write a program to calculate the distance between two points.
	Algorithm: **Step1: Start** **Step2: Read the x and y coordinates for point 1** **Step3: Read the x and y coordinates for point 2** **Step4: Calculate distance using the distance formula** **Step5: Print the value of distance** **Step6: End**
	Program with appropriate Comments:

program3_distance.py - D:\PES\Semester 1\Computer Science- Python Programming\Pytho.

File Edit Format Run Options Window Help

```
"""
Program to calculate the distance between two points.
"""
import math
x1 = int(input("Enter the x coordinate value for point 1 "))
y1 = int(input("Enter the y coordinate value for point 1 "))
x2 = int(input("Enter the x coordinate value for point 2 "))
y2 = int(input("Enter the y coordinate value for point 2 "))

#using distance formula
distance = float(math.sqrt((x1-x2)**2+(y1-y2)**2))

print("The distance between the two points is ",distance)
```

Out Put Screen shot:

```
C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program3_distance.py
Enter the x coordinate value for point 1 21
Enter the y coordinate value for point 1 4
Enter the x coordinate value for point 2 5
Enter the y coordinate value for point 2 6
The distance between the two points is  16.1245154965971

C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program3_distance.py
Enter the x coordinate value for point 1 45
Enter the y coordinate value for point 1 52
Enter the x coordinate value for point 2 44
Enter the y coordinate value for point 2 19
The distance between the two points is  33.015148038438355
```

Program 4

Given two timestamps of the same day: a number of hours, minutes and seconds for both of the timestamps. The moment of the first timestamp happened before the moment of the second one. Calculate how many seconds passed between them.

Algorithm:
Step1: Start
Step2: Read the value of hours, minutes, seconds for timestamp1
Step3: Read the value of hours, minutes, seconds for timestamp2
Step4: Convert hours and minutes into seconds for both timestamps
Step5: Find the difference between both the timestamps in seconds
Step6: Print the difference

	Step7: End

	Program with appropriate Comments:
	program4_timestamp.py - D:\PES\Semester 1\Computer Science- Python Programming\Pyt...
	File Edit Format Run Options Window Help
	`"""`
	`Given two timestamps of the same day: a number of hours, minutes and seconds for both of the timestamps. Calculate how many seconds passed between them.`
	`"""`
	`h1 = int(input("Enter hour value for timestamp 1: "))`
	`m1 = int(input("Enter minute value for timestamp 1: "))`
	`s1 = int(input("Enter second for timestamp 1: "))`
	`h2 = int(input("Enter hour value for timestamp 2: "))`
	`m2 = int(input("Enter minute value for timestamp 2: "))`
	`s2 = int(input("Enter second value for timestamp 2: "))`
	
	`#finding the difference between two timestamps by converting`
	`#both the timestamps into seconds`
	`seconds = (((h2*3600)+(m2*60)+s2)-((h1*3600)+(m1*60)+s1))`
	`print("The difference in timestamp is",seconds, "seconds")`

	Out Put Screen shot:
	`C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program4_timestamp.py`
	`Enter hour value for timestamp 1: 1`
	`Enter minute value for timestamp 1: 2`
	`Enter second for timestamp 1: 30`
	`Enter hour value for timestamp 2: 1`
	`Enter minute value for timestamp 2: 3`
	`Enter second value for timestamp 2: 20`
	`The difference in timestamp is 50 seconds`
	
	`C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program4_timestamp.py`
	`Enter hour value for timestamp 1: 2`
	`Enter minute value for timestamp 1: 34`
	`Enter second for timestamp 1: 50`
	`Enter hour value for timestamp 2: 2`
	`Enter minute value for timestamp 2: 45`
	`Enter second value for timestamp 2: 30`
	`The difference in timestamp is 640 seconds`

Program 5	Given a 4-digit integer number, display the individual digits & also compute the sum of digits.
	Algorithm: **Step1: Start**

Step2: Read a four digit number in num
Step3: Divide num by 10, remainder gives the fourth digit. Store value in fourthdigit
Step4: Divide num by 10, store the quotient in num
Step5: Repeat Step3 and Step4 for third digit, second digit, and first digit
Step6: Calculate the sum of all digits
Step7: Print all digits
Step8: Print sum
Step9: End

Program with appropriate Comments:

program5_4digitnum.py - D:\PES\Semester 1\Computer Science- Python Programming\PythonL...

File Edit Format Run Options Window Help

```
"""
Given a 4-digit integer number, display the individual digits & also
compute the sum of digits.
"""
num = int(input("Enter the four digit number: "))
fourthdigit = num%10 #gives the last digit of the number
num = num//10 #assigns a new value to num, excluding the last digit
thirddigit = num%10 #gives the third digit of the number
num = num//10 #assigns a new value to num, excluding the last two digit
seconddigit = num%10 #gives the second digit of the number
num = num//10#assigns a new value to num, excluding the last three digit
firstdigit = num%10

#calculates the sum of all digits
sum = firstdigit + seconddigit + thirddigit + fourthdigit
print("First digit= ",firstdigit)
print("Second digit= ",seconddigit)
print("Third digit= ",thirddigit)
print("Fourth digit= ",fourthdigit)
print("The sum of digits in the number is", sum)
```

Out Put Screen shot:

	C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program5_4digitnum.py Enter the four digit number: 3456 First digit= 3 Second digit= 4 Third digit= 5 Fourth digit= 6 The sum of digits in the number is 18 C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program5_4digitnum.py Enter the four digit number: 9876 First digit= 9 Second digit= 8 Third digit= 7 Fourth digit= 6 The sum of digits in the number is 30
Program 6	Swap the contents of two memory locations a) using temporary variable. b) without using temporary variable.
	Algorithm for swapping two numbers using a temporary variable **Step1: Start** **Step2: Read two values and store it in variables x and y** **Step3: Print the value of x and y before swapping** **Step4: Store value of x in temporary variable, temp** **Step5: Store value of y in variable x** **Step6: Store value of temp in y** **Step7: Print the value of x and y after swapping** **Step8: End** **Algorithm for swapping two numbers without using a temporary variable** **Step1: Start** **Step2: Read two values and store it in variables x and y** **Step3: Print the value of x and y before swapping** **Step4: x = x - y** **Step5: y = x + y** **Step6: x = y - x** **Step7: Print the value of x and y after swapping** **Step8: End**
	Program with appropriate Comments:

program6a_swap.py - D:\PES\Semester 1\Computer Science- Python Programming\PythonL...

File Edit Format Run Options Window Help

```
"""
Swap the contents of two memory locations using temporary variable.
"""
x = int(input("Enter the value of x "))
y = int(input("Enter the value of y "))
print("Value of x and y before swapping are",x,y,"respectively")
temp = x  #assigning value of x to temporary variable
x = y     #assigning value of y to x
y = temp  #assignig value of temporary variable to y
print("Value of x and y after swapping are",x,y,"respectively")

"""
Swap the contents of two memory locations without using temporary
variable.
"""
x = int(input("Enter the value of x "))
y = int(input("Enter the value of y "))
print("Value of x and y before swapping are",x,y,"respectively")
x = x-y
y = x+y
x = y-x
print("Value of x and y after swapping are",x,y,"respectively")
```

Out Put Screen shot:

```
C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program6a_swap.py
Enter the value of x 5
Enter the value of y 10
Value of x and y before swapping are 5 10 respectively
Value of x and y after swapping are 10 5 respectively
Enter the value of x 5
Enter the value of y 10
Value of x and y before swapping are 5 10 respectively
Value of x and y after swapping are 10 5 respectively

C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program6a_swap.py
Enter the value of x 34
Enter the value of y 41
Value of x and y before swapping are 34 41 respectively
Value of x and y after swapping are 41 34 respectively
Enter the value of x 29
Enter the value of y 66
Value of x and y before swapping are 29 66 respectively
Value of x and y after swapping are 66 29 respectively
```

Program 7	Program to

a) Convert temperature in celsius to fahrenheit

b) Convert temperature in fahrenheit to celsius

Algorithm:

Step1: Start
Step2: Read the value of temperature in Celsius in c
Step3: Convert to Fahrenheit using the formula and store it in variable f
f=(c*9/5) + 32
Step4: Print the value of temperature in degree Fahrenheit
Step5: Read the value of temperature in Fahrenheit in f
Step6: Convert to Celsius using the formula and store it in variable c
c= (f-32) * 5/9
Step7: Print the value of temperature in degree Celsius
Step8: End

Program with appropriate Comments:

program7_temperature.py - D:\PES\Semester 1\Computer Science- Python Programming\Py...

File Edit Format Run Options Window Help

```
"""
Program to
a)Convert temperature in celsius to fahrenheit
b)Convert temperature in fahrenheit to celsius
"""
c = float(input("Enter the value of temperature in Celsius "))
f = (c*9/5)+32    #using Fahrenheit to Celsius formula

print(c,"degree Celsius is equal to",f,"degree Fahrenheit")

f = float(input("Enter the value of temperature in Fahrenheit "))
c = (f-32)*5/9    #using Celsius to Fahrenheit formula
print(f,"degree fahrenheit is equal to",c,"degree Celsius")
```

Out Put Screen shot:

```
C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program7_temperature.py
Enter the value of temperature in Celsius 37.5
37.5 degree Celsius is equal to 99.5 degree Fahrenheit
Enter the value of temperature in Fahrenheit 99.5
99.5 degree fahrenheit is equal to 37.5 degree Celsius

C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program7_temperature.py
Enter the value of temperature in Celsius 45.6
45.6 degree Celsius is equal to 114.08000000000001 degree Fahrenheit
Enter the value of temperature in Fahrenheit 93.2
93.2 degree fahrenheit is equal to 34.0 degree Celsius
```

Program 8	Given the distance between 2 cities in kilometers. Write a Python program convert it into meters, centimeters, feet and inches and display the result.
	Algorithm: **Step1: Start** **Step2: Read the value of distance between the two cities in kilometers in distance** **Step3: Convert distance into meter by multiplying distance with 1000 and store in meters** **Step4: Convert distance into centimeter by multiplying meter with 100 and store in centimeters** **Step5: Convert distance into feet by multiplying meter with 3.2808399 and store in feet** **Step6: Convert distance into inches by multiplying meter with 39.3700787 and store in inches** **Step7: Print the distance between two cities in meters, centimeters, feet and inches** **Step8: End**

	Program with appropriate Comments:
	program8_distance.py - D:\PES\Semester 1\Computer Science- Python Programming\Pytho...
	File Edit Format Run Options Window Help
	`"""`
	`Given the distance between 2 cities in kilometers. A program to convert it into meters, centimeters, feet and inches and display the result.`
	`"""`
	`distance = float(input("Enter the distance between two points in kilometers "))`
	`meter = distance*1000 #converting kilometer into meter`
	`centimeter = meter*100 #converting kilometer into centimeters using meters`
	`feet = 3.2808399*meter #converting kilometer into feet using meters`
	`inches = 39.3700787*meter #converting kilometer into inches using meters`
	`print("Distance in meters= ",meter)`
	`print("Distance in centimeter= ",centimeter)`
	`print("Distance in feet= ",feet)`
	`print("Distance in inches= ",inches)`

	Out Put Screen shot:

	C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program8_distance.py Enter the distance between two points in kilometers 5 Distance in meters= 5000.0 Distance in centimeter= 500000.0 Distance in feet= 16404.199500000002 Distance in inches= 196850.3935 C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program8_distance.py Enter the distance between two points in kilometers 14 Distance in meters= 14000.0 Distance in centimeter= 1400000.0 Distance in feet= 45931.7586 Distance in inches= 551181.1018000001
Program 9	A school decided to replace the desks in three classrooms. Each desk sits two students. Given the number of students in each class, print the smallest possible number of desks that can be purchased.The program should read three integers: the number of students in each of the three classes, a, b and c respectively.In the first test there are three groups. The first group has 20 students and thus needs 10 desks. The second group has 21 students, so they can get by with no fewer than 11 desks. 11 desks is also enough for the third group of 22 students. So we need 32 desks in total.
	Algorithm: **Step1: Start** **Step2: Read the value of number of students in three sections in a, b and c** **Step3: numa= (a//2) + (a%2)** **Step4: Repeat step 3 for section b and c** **Step5: Print the number of benches in each section, a, b and c** **Step6: End**
	Program with appropriate Comments:

program9_students.py - D:\PES\Semester 1\Computer Science- Python Programming\Pytho...

File Edit Format Run Options Window Help

```
"""
Given the number of students in each class, print the smallest possible number
of desks that can be purchased. Given that two people can sit on each bench
"""
a = int(input("Enter the number of students in section A "))
b = int(input("Enter the number of students in section B "))
c = int(input("Enter the number of students in section C "))

"""
if 'a' is the number of students in a class, then
a//2 will give the total number of benches required,
with two students in each bench
a % 2 will give the extra bench required if the number
of students is an odd number
"""
numa = (a//2)+(a%2)
numb = (b//2)+(b%2)
numc = (c//2)+(c%2)
print("Number of benches for A=",numa)
print("Number of benches for B=",numb)
print("Number of benches for C=",numc)
```

Out Put Screen shot:

```
C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program9_students.py
Enter the number of students in section A 20
Enter the number of students in section B 21
Enter the number of students in section C 22
Number of benches for A= 10
Number of benches for B= 11
Number of benches for C= 11

C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program9_students.py
Enter the number of students in section A 43
Enter the number of students in section B 44
Enter the number of students in section C 51
Number of benches for A= 22
Number of benches for B= 22
Number of benches for C= 26
```

Program 10	Given the integer N - the number of seconds that is passed since midnight - how many full hours and full minutes are passed since midnight? The program should print two numbers: the number of hours (between 0 and 23) and the number of minutes

	(between 0 and 1339). For example, if N = 3900, then 3900 seconds have passed since midnight. Therefore, the time now is 1:05am. So the program should print 1 65 - 1 full hour is passed since midnight, 65 full minutes passed since midnight.
	Algorithm: **Step1: Start** **Step2: Read the value of seconds passed since midnight in t** **Step3: Calculate number of hours, hours = t/3600** **Step4: Calculate the number of minutes from remaining t (taking remainder of t/3600)** **Step5: Calculate the number of seconds from remaining minutes (taking remainder of t/ (3600*60))** **Step6: Print the number of hours, minutes and seconds** **Step7: End**
	Program with appropriate Comments: program10_time.py - D:\PES\Semester 1\Computer Science- Python Programming\PythonLa... File Edit Format Run Options Window Help `"""` `Given the integer N - the number of seconds that is passed since midnight - how many full hours and full minutes are passed since midnight? The program should print two numbers: the number of hours (between 0 and 23) and the number of minutes (between 0 and 1339). For example, if N = 3900, then 3900 seconds have passed since midnight. Therefore, the time now is 1:05am. So the program should print 1 65 -` `1 full hour is passed since midnight, 65 full minutes passed since midnight.` `"""` `t = int(input("Enter the number of seconds passed since midnight: "))` `hours = t//3600 #calculate number of hours by dividing t with 3600` `minutes = ((t%3600)//60) #calculate number of minutes from remaining t` `seconds = ((t%3600)%60) #gives remaining number of seconds` `print("Hours=",hours)` `print("Minutes=",minutes)` `print("Seconds=",seconds)`
	Out Put Screen shot:

```
C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program10_time.py
Enter the number of seconds passed since midnight: 3900
Hours= 1
Minutes= 5
Seconds= 0

C:\Users\Naren\AppData\Local\Programs\Python\Python39>python program10_time.py
Enter the number of seconds passed since midnight: 7565
Hours= 2
Minutes= 6
Seconds= 5
```