MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

NATIONAL TECHNICAL UNIVERSITY

«KHARKIV POLYTECHNIC INSTITUTE»

Department of Software Engineering and Management Information Technologies

Report from lab № 3

discipline «Fundamentals of python»

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***Laboratory work 3 (calculations, math)***

*1. "The last digit of the number"*

Given a natural number. Print its last digit.

*2. "MRR"*

The length of the Moscow Ring Road is 109 kilometers. Biker Peter starts from the zero kilometer of the Moscow Ring Road and rides at a speed of *v* kilometers per hour. At what point will he stop after *t* hours?

The program receives the input value *v* and *t*. If *v*> 0, then Peter moves in the positive direction along the Moscow Ring Road, if the value *v* <0, then in the negative.

The program should print an integer from 0 to 108 – the number of the mark on which Peter will stop.

*3. "Fractional part"*

Given a positive real number *X*. Print its fractional part.

*4. "The first digit after the period"*

Given a positive real number X. Print its first digit after the decimal point.

*5. "End of lessons"*

At some schools, classes begin at 9:00. Lesson duration - 45 minutes, after the 1st, 3rd, 5th, etc. lessons change 5 minutes, and after the 2nd, 4th, 6th, etc. - 15 minutes.

The lesson number is given (a number from 1 to 10). Determine when the specified lesson ends.

Print two integers: the end time of the lesson in hours and minutes.

*6. "Auto Race"*

A car drives *n* kilometers in a day. How many days does it take to travel a route of length *m* kilometers? The program receives the input numbers *n* and *m*.

*7. "Cost of purchase"*

A pie in the dining room costs *a* rubles and *b* cents. Determine how many rubles and cents you need to pay for *n* pies. The program receives three numbers as input: *a*, *b*, *n*, and should output two numbers: the purchase price in rubles and cents.

*8. “The difference of times”*

The values of two points in time belonging to the same day are given: hours, minutes and seconds for each of the points in time. It is known that the second moment of time did not come earlier than the first. Determine how many seconds elapsed between two points in time.

The input program receives three integers: hours, minutes, seconds, which specify the first moment of time and three integers, which specify the second moment of time.

Print the number of seconds between these points in time.

9. "Snail"

The snail creeps along a vertical pole with a height of *h* meters, rising *a* meters a day, and going down *b* meters a night. What day does the snail crawl to the top of the pole?

The program receives input natural numbers *h*, *a*, *b*.

The program should print one natural number. It is guaranteed that *a> b*.

*10. “The Number of Tens”*

Given a natural number. Find the number of tens in its decimal notation.

*11. "The sum of the numbers"*

A three-digit number is given. Find the sum of its numbers.

*12. “Hypotenuse”*

Two numbers *a* and *b* are given. Derive the hypotenuse of a triangle with given legs.

*13. “Clock - 1”*

H hours, M minutes, S seconds (0 ≤ H <12, 0 ≤ M <60, 0 ≤ S <60) passed from the beginning of the day. Using the given numbers H, M, S, determine the angle (in degrees) that the hour hand has turned from the beginning of the day and print it as a real number.

*14. “Clock - 2”*

From the beginning of the day, the hour hand turned at an angle of α degrees. Determine what angle the minute hand has turned since the beginning of the last hour. Input and output data are real numbers.

*15. “Clock - 3”*

Condition

From the beginning of the day, the hour hand turned at an angle of α degrees. Determine how many full hours, minutes and seconds have passed since the beginning of the day, that is, solve the problem inverse to the "Clock - 1" task. Write the answer in three variables and display them on the screen.

*16. “Interest”*

The interest rate on the deposit is *P* percent per annum, which are added to the amount of the deposit. The contribution is *X* rubles *Y* kopecks. Determine the size of the contribution in a year.

The program receives integers *P*, *X*, *Y* as input and must output two numbers: the value of the contribution in a year in rubles and cents. The fractional part of cents is discarded.

Solution

import math as m

import sys

#1

def lastDegit():

    num  = int(input("plese enter num"));

    print("the last digt is  : ", num % 10)

#2

def MRR():

    totalDistance =109

    speed = int(input("input the speed : "))

    time = int(input("onput the time passed : "))

    distance = speed \* time

    if distance > totalDistance:

        print("the biker has crossed the road completly ")

    else:

        print("the biker has stoped after riding {0}km ".format(distance))

#3

def fractional():

    num = float(input("enter the number : "))

    frac = m.modf(num)

    print("the fraction part of the number is : ", frac[0])

#4

def afterDecimal():

    number = float(input("enter the number please  : "))

    num = str(number)

    index=  str(number).find(".")

    print(num[index+1])

#5

def gettime(count,lessons):

    counter = 1

    time= 0

    for item in lessons:

        time += 45

        if (counter % 2) == 0:

            time += 15

        else:

            time +=5

        if counter == count:

            return time

        counter +=1

def endLesson():

    lessons=[1,2,3,4,5,6,7,8,9,10]

    count = int(input("enter the lesson number : "))

    time = gettime(count,lessons)

    hour = 9 + int(time / 60 )

    extraMin = time % 60

    print("the end time of lesson  is {0} : {1} " .format(hour,extraMin))

 #7

#6

def autoRace():

    n = int(input("please enter how much is covered in a day : "))

    m = int (input("input new distance covered : "))

    days = float(n/m)

    print("number of days taken for new jorney : ", days)

#7

def purchase():

    a = int(input("enter how many rubles : "))

    b = int(input("enter how many cents "))

    n = int(input("enter number of pies to be bought "))

    totala  = n \* a

    totalb = n \* b

    #totala += int(totalb / 100 )

    #totalb = totalb % 100

    print(" to buy {0}pies you need {1} rubles and {2} cents !!" .format(n,totala,totalb))

#8

def diffTime():

    hour1 = 60 \* 60 \* int(input("enter hour 1 :"))

    min1 = 60 \* int(input("enter min 1 "))

    sec1 = int (input("enter seconds 1"))

    total1  = hour1 +min1 + sec1

    hour2 = 60 \* 60 \*int(input("enter hour 2 : "))

    min2 = 60 \*int(input("enter min 2 : "))

    sec2 = int (input("enter seconds 2 : "))

    total2 = hour2 + min2 + sec2

    totalDiff = total2 - total1

    ''' diffHour = int(totalDiff / 3600)

    diffMin = int((totalDiff % 3600) / 60)

    diffSec = int(((totalDiff % 3600) %60))'''

    print(" the diffrence in seconds is {0}" .format(totalDiff))

#9

def snail():

    h = int(input("height of the pole : "))

    a = int(input ("enter the meters covered during the day : "))

    b = int(input ("enter the distance retracted druing the night  :"))

    day = a - b

    print("days taken to climb the pole : " , float(h / day))

#10

def tens():

    num = float(input("enter the number : "))

    sdf = len(str(num))

    index= str(num).find('.')

    lis = sdf - index- 1

    print("there {0} tens in the number " .format(lis))

#11

def sumr():

    num  = [char for char in input("enter number : ")]

    sums = 0

    for char in num :

        sums += int(char)

    print(sums)

#12

def triangle():

    a = int(input("please input the value a "))

    b = int(input("please enter the value b"))

    hypo =  m.sqrt((a\*a) + (b\*b))

    print ("hypotenuse is : " ,hypo)

#13

def clock1():

    #The angle measure between any two consecutive numbers on a clock is 360/12=30∘

    h = int(input("input the hour : "))

    m = float(input("input the min : "))

    s = float(input("enter extra seconds passed : "))

   # hj = (s/60)

    m = ((s/60)+m) \* (30/60)

    h = h \* 30

    ddegre = h +m

    print("the degree passed is : " ,ddegre)

#14

def clock2():

    #for every min the min hand covers 6∘

    angle = float(input("input the angle : "))

    mins\_an = (angle % 30)

    mins = mins\_an \* 2

    mins\_angle = mins \* 6

    print("the degree passed is : " , mins\_angle)

#15

def clock3():

    angle =   float(input("input the angle : "))

    hour  = angle // 30

    a = m.modf(angle % 30)

    mins = a[1] \* 2

    secs = a[0] \* 60

    print("trhe value hours passed : ", hour)

    print("trhe value mins is  :  ", mins)

    print("trhe value secs : ", secs)

#16

def interest():

    percent = int(input("input  the interest percent : "))

    Xvalue  = float(input("please input the value of X : "))

    Yvalue  = float(input("please input the value of Y : " ))

    deposit = Xvalue + (Yvalue / 100 )

    interest = (percent / 100 ) \* deposit

    year\_Contribution = deposit + interest

    cents  = year\_Contribution \* 100

    print(" the value of contribution after one year is : {0} in rubles and  : {1} in cents " .format(year\_Contribution, cents))

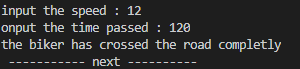
if \_\_name\_\_ == "\_\_main\_\_":

   interest()

No1:



No2:



No3:



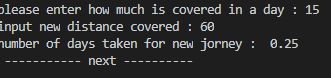
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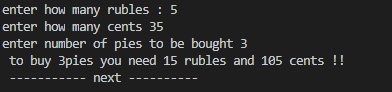
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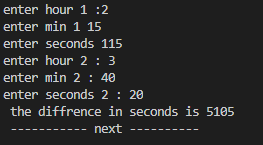
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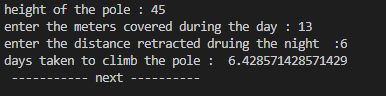
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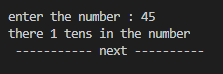
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No9:



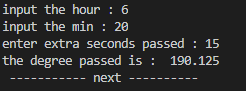
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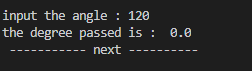
No11:



No12:



No13:



No14:

