2810ICT Week1 PythonLab

1. Problem: Write a program that prompt to read a time interval in hours, minutes and seconds and prints the equivalent time in just seconds.

Input: 1 10 20   
Output: 4220  
Input: 0 40 50   
Output: 2450

Solution:

time = input("input a time as hh mm ss: ")  
hh, mm, ss = time.split(' ')  
  
print("time in seconds: ", int(hh)\*3600 + int(mm)\*60 + int(ss))

1. Problem: Write a Python program that prompts to read a cost of an item (less than or equal to one dollar), gives the number of 50 cent, 20 cent, 10 cent, 5 cent and 1 cent coins the buyer would receive if they handed over one dollar. You must minimise the number of coins in the change..

Input: 50   
Output: 10000   
Input: 66   
Output: 01110

Solution:

cost = input("input cost between 0 and 100 cents: ")  
  
coins = []  
  
change = 100 - int(cost)  
  
fiftyc = change/ 50  
change = change % 50  
  
twentyc = change / 20  
change = change % 20  
  
tenc = change / 10  
change = change % 10  
  
fivec = change / 5  
change = change % 5  
  
onec = change  
  
print(int(fiftyc),int(twentyc),int(tenc),int(fivec),int(onec))

1. Problem: Input an integer, print True if it is greater than zero and print False if it is not greater than zero.

Input: 12   
Output: True   
Input: -8   
Output: False

Solution:

inputint = input("input a number: ")  
  
if int(inputint) > 0:  
 print(True)  
else:  
 print(False)  
  
problem 4  
nums = input("input 2 numbers serparated by a space: ")  
  
first, second = nums.split(' ')

1. Problem: Write Python code that reads two integers from the keyboard. If the first integer is in the range 1. . 100 and the first integer is less than the second integer OR if the first integer is at least twice the second integer and the second integer is not in the range -8..16 (with the exception it can be zero) print True. Otherwise print False. You must NOT use the Python if or if-else statement. All ranges are inclusive.

Input: 10 50   
Output: True   
Input: 20 5   
Output: False   
Input: 2 0   
Output: True

Solution:

nums = input("enter 2 numbers separated by space: ")  
  
a, b = nums.split(' ')  
  
c = int(a)  
d = int(b)  
  
while (c in range(1, 100) and c < d) or (c >= d \* 2 and (d not in range(-8, 16) or d == 0)):  
 print(True)  
 d = 12  
 c += 12  
while c == int(a) and d == int(b):  
 print(False)  
 c += d  
 d += c

1. Problem: Given three integers, a b c, one of them is small, one is medium and one is large. Print True if the three values are evenly spaced, so the difference between small and medium is the same as difference between medium and large. Otherwise, print False.

Input: 2 4 6  
Output: True   
Input: 4 6 2   
Output: True   
Input: 4 6 3   
Output: False

Solution:

nums = input("input 3 numbers separated by a space: ")  
  
num1, num2, num3 = nums.split(' ')  
  
if int(num1) > int(num2) and int(num1) > int(num3):  
 if int(num2) > int(num3) and int(num1) - int(num2) == int(num2) - int(num3):  
 print(True)  
 elif int(num3) > int(num2) and int(num1) - int(num3) == int(num3) - int(num2):  
 print(True)  
 else:  
 print(False)  
elif int(num2) > int(num1) and int(num2) > int(num3):  
 if int(num1) > int(num3) and int(num2) - int(num1) == int(num1) - int(num3):  
 print(True)  
 elif int(num3) > int(num1) and int(num3) - int(num1) == int(num2) - int(num3):  
 print(True)  
 else:  
 print(False)  
elif int(num3) > int(num1) and int(num3) > int(num2):  
 if int(num1) > int(num2) and int(num3) - int(num1) == int(num1) - int(num2):  
 print(True)  
 elif int(num2) > int(num1) and int(num3) - int(num2) == int(num2) - int(num1):  
 print(True)  
 else:  
 print(False)  
else:  
 print(False)

1. Problem: Write a program which takes a number n and adds up the numbers in the range 0..n

Input: 3   
Output: 6   
Input: 10   
Output: 55   
Input: 20   
Output: 210

Solution:

n = input("input a number: ")  
total = 0  
  
for a in range(0, int(n)+1):  
 total += a  
  
print(total)  
  
problem 7  
words = input("enter two words: ")  
  
one, two = words.split(" ")  
  
if len(one) > 0 and len(two) > 0:  
 newword = one[0] + two[-1]  
elif len(one) == 0 and len(two) > 0:  
 newword = "@" + two[-1]  
elif len(one) > 0 and len(two) == 0:  
 newword = one[0] + "@"  
else:  
 newword = "@@"  
  
print(newword)

1. Problem: Given 2 strings, a and b, print a new string made of the first char of a and the last char of b, so "yo" and "Python" yields "yn". If either string is length 0, use '@' for its missing char. For example:

Input: "last", "chars"   
Output: "ls”   
Input: "yo", "Python"   
Output: "yn”   
Input: "hi", ""   
Output: "h@"

Solution:

words = input("enter two words: ")  
  
one, two = words.split(" ")  
  
if len(one) > 0 and len(two) > 0:  
 newword = one[0] + two[-1]  
elif len(one) == 0 and len(two) > 0:  
 newword = "@" + two[-1]  
elif len(one) > 0 and len(two) == 0:  
 newword = one[0] + "@"  
else:  
 newword = "@@"  
  
print(newword)

1. Problem: Given two strings, append them together (known as "concatenation") and print the result. However, if the concatenation creates a double-char, then omit one of the chars, so "abc" and "cat" yields "abcat”.

Input: "abc", "cat"  
Output: "abcat”   
Input: "dog", "cat"   
Output: "dogcat”   
Input: "abc", ""   
Output: "abc"

Solution:

words = input("input two words: ")  
  
first, second = words.split(" ")  
  
if first[-1] == second[0]:  
 concword = first + second[1:]  
else:  
 concword = first + second  
  
print(concword)

1. Problem: Given a number n, write while and for loops that add up the numbers in the series 1,2,3,4,..., n-2, n-1, n and display the resultant sum. The number n will be input by the user of the algorithm.

Input: 10   
Output: 55 55

Solution:

n = int(input("input a number: "))  
  
total = 0  
  
for a in range(0, n+1):  
 total += a  
  
sumnums = 0  
  
while n >= 0:  
 sumnums += n  
 n -= 1  
  
print(total, sumnums)

1. Problem: Given 2 strings, a and b, print a string of the form short+long+short, with the shorter string on the outside and the longer string on the inside. The strings will not be the same length, but they may be empty (length 0).

Input: "Hello", "hi"   
Output: "hiHellohi"   
Input: "aaa", "b"   
Output: "baaab"

Solution:

words = input("Please input 2 words separated by a space: ")  
  
a, b = words.split(' ')  
  
if len(a) > len(b):  
 print(b+a+b)  
elif len(a) == len(b):  
 print("equal length words")  
else:  
 print(a+b+a)

11. Problem: Given a string, print a version without the first 2 chars. Keep the first char if it is 'a' and keep the second char if it is 'b'. The string may be any length.

Input: "Hello"   
Output: "llo"   
Input: "java"   
Output: "va"   
Input: "away"   
Output: "aay"

Solution:

string = input("enter a string: ")  
  
if string[0] == 'a' and string[1] == 'b':  
 print(string)  
elif string[0] == 'a':  
 print(string[0]+string[2:])  
elif string[1] == 'b':  
 print(string[1:])  
else:  
 print(string[2:])

12. Problem: Input a list of integers, print True if 6 appears as either the first or last element in the list. The list will be length 1 or more.

Input: 1 2 6   
Output: True   
Input: 1 2 3   
Output: False   
Input: 3 2 1   
Output: False

Solution:

ints\_input = input("Input a list of integers spearated by a space: ")  
  
ints\_string = ints\_input.split(' ')  
  
ints = []  
  
for a in ints\_string:  
 ints.append(int(a))  
  
if ints[0] == 6 or ints[-1] == 6:  
 print(True)  
else:  
 print(False)

13. Problem: Say that a "clump" in a list is a series of 2 or more adjacent elements of the same value. Print the number of clumps in the given list.

Input: 1 2 2 3 4 4   
Output: 2   
Input: 1 1 2 1 1   
Output: 2   
Input: 1 1 1 1 1   
Output: 1

Solution:

nums = input("input a list of number with no spaces: ")  
  
numslist = []  
  
for a in nums:  
 numslist.append(int(a))  
  
clumps = 0  
  
i = 0  
  
while i < (len(numslist) - 1):  
 elem = 0  
 while (i + 1) < len(numslist) and numslist[i] == numslist[i+1]:  
 elem = 1  
 i += 1  
  
 if elem:  
 clumps += 1  
  
 i += 1  
  
print(clumps)

14. Problem: Write a program that reads the file phillip.txt, counts the number of words in the file, and prints out the count.

Solution:

fname = 'phillip.txt'  
  
chars = 0  
  
with open(fname, 'r') as file:  
  
 count = 0  
 string = file.read()  
  
 for line in string:  
 words = line.split()  
 for word in words:  
 char = word.split()  
 count += 1  
  
print(count)

phillip.txt

hello my name is phillip  
i am 35  
and i love cats

15. Write a function that given a list length 1 or more of integers, print the difference between the largest and smallest values in the list.

Input: 10 3 5 6   
Output: 7   
Input: 7 2 10 9   
Output: 8   
Input: 2 10 7 2   
Output: 8

Solution:

nums = input("input a list of numbers separated by space: ")  
  
numlist = []  
  
for a in nums.split():  
 numlist.append(int(a))  
  
numlist.sort()  
difference = int(numlist[-1] - numlist[0])  
  
print(difference)

16. Define a business class. Write a constructor (\_\_init\_\_) to set up the business with initial values including name, address, founding year, email address and phone number. Write a function called changephone to update the phone number.

Solution:

class Business:  
  
 def \_\_init\_\_(self, name, address, fyear, email, phnum):  
 self.name = name  
 self.address = address  
 self.fyear = fyear  
 self.email = email  
 self.phnum = phnum  
  
 def changephone(self, new\_phnum):  
 self.phnum = new\_phnum