# Lab – 5 For loop

Tasks:

1. Consider the program segment below:

low = int(input("Input a smaller number: "))

high = int(input("Input a larger number: "))

sum = 0

for i in range(low, high+1):

sum = sum + i

print ("Sum of number within", low, "and", high, "=", sum)

1. Fill in the blanks below:
2. If low = 2, high = 4, sum = 9
3. If low = 4, high = 2, sum = 0
4. If low = 2, high = 2, sum = 2
5. If low > high, sum = 0
6. If low <= high, sum equals to sum of all integers in between low and high .
7. Convert the for loop in the above program segment to a while loop

Answer:

low = int(input("Input a smaller number: "))

high = int(input("Input a larger number: "))

sum = 0

i = low

while (i <= high):

sum = sum + i

i = i + 1

print ("Sum of number within", low, "and", high, "=", sum)

1. Write a program to compute the product of all even integers in between 50 and 60 using for loop

Output:

Product of all the even integers in between 50 and 60 = 27361152000

Answer:

a = 50

n = 60

product = 1

for i in range (a, n+1, 2):

product \*= i

print ("Product of all the even integers in between 50 and 60 =", product)

1. Write a program to construct the following pattern based on user’s input (integer 1 to 9) using for loop with range function.

Output:

Input the value n: 6

User’s input

1

22

333

4444

55555

666666

Hints: "A" \* 3 is a valid statement and will give "AAA"

Answer:

n = int(input("Input the value n: "))

for i in range(n+1):

print (str(i)\*i)

1. Write a program to sum up all the integers up to user’s input n using for loop with range function.

(i.e. 1 + 2 + 3 + … + n)

Output:

User’s input

Input the value n: 10

Sum of sequence 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55

Hints: A string variable, e.g. word, can be used to store the intermediate values or prepare the output string. The  
print ( ) method can be called after the output string is prepared.

Answer:

n = int(input("Input the value n: "))

word = "Sum of sequence 1"

value = 1

for i in range(2, n+1, 1):

word = word + " + " + str(i)

value = value + i

word = word + " = " + str(value)

print (word)

1. Write a program to accumulate all even numbers in between 1 and 1000. Your program should display all even numbers from 1 to 1000, forty numbers per line and the sum of these numbers. A sample output is shown below:

Output:

2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40

42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80

…

922, 924, 926, 928, 930, 932, 934, 936, 938, 940, 942, 944, 946, 948, 950, 952, 954, 956, 958, 960

962, 964, 966, 968, 970, 972, 974, 976, 978, 980, 982, 984, 986, 988, 990, 992, 994, 996, 998, 1000

Sum of all even numbers within 1 and 1000 = 250500

Answer:

a = 2

n = 1000

sum = 0

text = ""

for i in range (a, n+1, 2):

sum += i

text += str(i)

if i == n or i % 40 == 0:

print (text)

text = ""

else:

text += ", "

print ("Sum of all even numbers within 1 and 1000 =", sum)

1. Write a program to ask user enter three integers: low, high and divisor. Your program will then display the sum of all numbers divisible by divisor within low and high inclusively. If low > high, you should swap these two values before using a for loop to compute the required sum.

Output:

Input lower limit: 15

User’s input

Input upper limit: 7

Input divisor (n): 3

i = 9 sum = 9

i = 12 sum = 21

i = 15 sum = 36

Sum of all numbers divisible by n: 36

Answer:

low = int(input ("Input lower limit: "))

high = int(input ("Input upper limit: "))

divisor = int(input ("Input divisor (n): "))

sum = 0

if low > high: #exchange low and high

temp = low

low = high

high = temp

for i in range(low, high+1, 1):

if i % divisor == 0:

sum += i

print ("i =", i, "sum =", sum)

print ("Sum of all numbers divisible by n:", sum)

1. Write a program that uses a nested loop to display the following pattern:

Output:

1-1 1-2 1-3 1-4 1-5

2-1 2-2 2-3 2-4 2-5

3-1 3-2 3-3 3-4 3-5

Hints: \t can be used in strings to add tab spaces

Answer:

row = 3

column = 5

for i in range(1, row+1, 1):

text = ""

for j in range(1, column+1, 1):

text += str(i)+"-"+str(j)+"\t"

print (text)

1. Write a program that prompts the user to input an integer n. It then displays a multiplication table from 1 to n

Output:

Input table size n: 4

User’s input

1 2 3 4

1 1 2 3 4

2 2 4 6 8

3 3 6 9 12

4 4 8 12 16

Answer:

n = int(input("Input table size n: "))

text = ""

for i in range(1, n+1, 1):

text += "\t"+str(i)

print(text+"\n")

for i in range(1, n+1, 1):

text = str(i)

for j in range(1, n+1, 1):

text += "\t"+str(i\*j)

print (text)

1. Write a program to ask user to input an integer. It then displays a message to indicate whether the given integer is a prime number. A prime number is an integer that is not divisible by any number other than itself and 1. By definition, 0 and 1 are not prime number. For example, 2, 3, 5 and 7 are prime numbers.

Output:

Input an integer: 6

User’s input

6 is not a prime number!

Input an integer: 11

User’s input

11 is a prime number!

Answer:

number = int(input ("Input an integer: "))

is\_prime = True

if number <= 1 or number != 2 and number % 2 == 0:

is\_prime = False

for i in range(3, number, 2):

if number % i == 0:

is\_prime = False

break

if is\_prime:

print (number, "is a prime number!")

else:

print (number, "is not a prime number!")