```python
#Qn 1a)
first, last = eval(input("Enter 2 numbers"))
for number in range(first, last + 1):
    print(number, end = " ")
#Qn 1b)
#Add all the numbers between num1 and num2
num1, num2 = eval(input("Enter 2 numbers:"))
if num1 < num2:
    for number in range(num1, num2 + 1):
        print(number, end = " ")
else:
    for number in range(num2, num1 + 1):
        print(number, end = " ")
#Qn1b) version 2
num1, num2 = eval(input("Enter 2 numbers:"))
if num1 < num2:
    first = num1
    last = num2 + 1
else:
    first = num2
    last = num1 + 1

total = 0
for number in range(first, last):
    print(number, end = " ")
    total = total + number

print("total is", total)
```

```
Enter 2 numbers 13,25
13 14 15 16 17 18 19 20 21 22 23 24 25 Enter 2 numbers: 13,25
13 14 15 16 17 18 19 20 21 22 23 24 25 Enter 2 numbers: 13,25
13 14 15 16 17 18 19 20 21 22 23 24 25 total is 247
```

```python
'''
Ask user to enter 2 numbers: n1, n2, n1 < n2
 - Print all numbers between n1 and n2
 - Sum all the numbers
 - Count how many numbers are divisible by 3 and 5
'''

n1, n2 = eval(input("Enter 2 numbers"))

total = 0
multipleOf3and5 = 0
for number in range (n1, n2 + 1):
    print (number, end = " ")
    total = total + number
    if number % 3 == 0 and number % 5 == 0:
        multipleOf3and5 = multipleOf3and5 +1
print(total)
print(multipleOf3and5)
```

```
Enter 2 numbers     30,40
30 31 32 33 34 35 36 37 38 39 40 385
```

1

```
strValue = input("Enter something: ")
number = int(input("Enter a number: "))

for rep in range(number):
    print(strValue)
```

```
Enter something: hello
Enter a number: 3
hello
hello
hello
```

```
strValue = input("Enter something: ")
number = int(input("Enter a number: "))

for rep in range(number):
    print(strValue * (rep + 1) )
```

```
Enter something: hello
Enter a number: 5
hello
hellohello
hellohellohello
hellohellohellohello
hellohellohellohellohello
```

```
'''
This question is to change the for Loop (question 2) to while loop
The input will be in 2 parts: one string and one number
If the string is "exit", the loop will stop
If not, the string will be print certain number of times
'''

strValue = input("Enter string: ").lower # read and convert to lower case
# Take note that when user wants to end the program, he can
# enter "exit" "EXIT" "eXIT" "ExIT"...
# To simplify the check, we can convert input to either all
# upper case or lower case using upper () or lower () function

# We can do it in 2 steps, read first, then convert
# We can also do both read and convert in one step
# Check whether the loop should continue
while strValue != "exit": # Loop will go on as long as not "exit"
    num = int(input("Number of time to repeat: "))
    for rep in range(num):
        print(strValue)

    strValue = input("Enter string: ").lower # Read the next string then back to
the top of the loop to check
# If you read this program, it will print the same thing non-stop
#Infinite loop
# Notice we have a loop inside another loop: nested loop
```

```
n = int(input("Enter an integer number:"))

for number in range(1, 6):
    print(number, "X", n, "=", (number * n))
```

```
Enter an integer number: 5
1 X 5 = 5
2 X 5 = 10
3 X 5 = 15
4 X 5 = 20
5 X 5 = 25
```

```
n = int(input("Enter an integer number:"))
rows = int(input("How many rows to print"))

for number in range(1, rows + 1):
    print(number, "X", n, "=", (number * n))
```

```
How many rows to print    10
1 X 5 = 5
2 X 5 = 10
3 X 5 = 15
4 X 5 = 20
5 X 5 = 25
6 X 5 = 30
7 X 5 = 35
8 X 5 = 40
9 X 5 = 45
10 X 5 = 50
```

```
'''
Extra question on for loop
Roll 2 dices
If they form a pair, print a message
Count number of time it is a pair
'''
import random

pairCount = 0
for rep in range(100):
    dice1 = random.randint(1,6) #Gives diff number between 1 to 6
    dice2 = random.randint(1,6)
    if dice1 == dice2:
        print("it is a pair")
    if dice1 == dice2:
        pairCount = pairCount + 1

print(pairCount)
```

```
it is a pair
it is a pair
```

```
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
it is a pair
1683
```

```
'''
While Loop
'''
num = 1
while num <= 10:
    print(num)
    num = num + 1

for num in range(1,11):
    print(num)
```

```
1
2
3
4
5
6
7
8
9
10
1
2
3
4
5
6
7
8
9
10
```

```
'''
Use a while loop to ask user to enter a number,
print the number...
Stop the loop when user enter -999

- count the number of iteration
- sum all the numbers
- count the number of even numbers
'''
evenCount = 0
count = 0
```

```
total = 0
num = int(input("Enter a number: "))
while num != -999:
    count = count + 1
    total = total + num
    print(num)
    if num % 2 == 0:
        evenCount = evenCount + 1

    num = int(input("Enter next number: "))

print(count)
```

```
option = -1
while option != 0:
    print("1. Option1")
    print("2. Option2")
    print("3. Option3")
    print("0. Quit")
    option = int(input("Enter an option: "))
    if option == 0:
        print("End of program")
    elif option >=1 and option <=3:
        print("Option", option, "selected")
    else:
        print("Invalid option")
```

```
1. Option1
2. Option2
3. Option3
0. Quit
Enter an option: 1
Option 1 selected
1. Option1
2. Option2
3. Option3
0. Quit
Enter an option: 2
Option 2 selected
1. Option1
2. Option2
3. Option3
0. Quit
Enter an option: 3
Option 3 selected
1. Option1
2. Option2
3. Option3
0. Quit
Enter an option: 0
End of program
```

```
'''
Use Loop to calculate the square of a number (do not use math function)
```

```
Given a number: N, the square of N is
1 + 3 + 5 .... N times
In other words, the first N odd numbers

Example:
square of 4 is 1 + 3 + 5 + 7 = 16
square of 5 is 1 + 3 + 5 + 7 + 9 = 25
square of 7 is 1 + 3 + 5 + 7 + 9 + 11 + 13 = 49

Therefore, your program will ask for 1 number and compute the square of that
number.

Various ways to solve, one way is for loop
If the input is stored in a variable: num, then the last number is num*2
E.g.

num is 4, 4 x 2 = 8
num is 5, 5 x 2 = 10
num is 7, 7 x 2 = 14
so we can use the function: range(1, num*2)
'''

#First method

num = int(input("Enter a number"))
total = 0
for number in range(1, num*2, 2): #Remember number will stop at (num*2) - 1
    total = total + number
print("Square of", num , "is", total)

#Second method
#simply repeat loop "num" times
#Use the same variables: num, total

total = 0
number = 1
for rep in range(num): #Simply run the loop "num" times
    total = total + number
    number = number + 2 #We increment the number by 2 manually

print(total)



Enter a number 5
Square of 5 is 25
25



'''
This question is similar to something we did before but more general:

Ask user to enter a number. Do not convert (don't need to) the input from
string to integer.
Use a loop to add all the digits in the input
Example:
User input: "123" output is 6
User input: "1011" output is 3
User input: "50211" output is 9
```

```
Use for loop, convert each character to int, add it to total
'''

numStr = input("Enter a number: ") # numStr is read as a string
# Set up a loop to add each character in numStr
total = 0
for oneChar in numStr: # This is one way to setup the loop, for oneChar in numStr"
will split the string into individual character
    value = int(oneChar) # Convert char to int
    total = total + value
print("Sum of all digits is", total)

#Another version, longer, but may be more "natural"
total = 0
for n in range(len(numStr)): # n is 0, 1, 2, 3, ...
    oneChar = numStr[n] # Use the variable name and []
    value   = int(oneChar)  # Same as previous example
    total   = total + value  # Same
print(total)

# Version 2: we use n in range (...) to get a set of values:
# Assuming the input is "1034", len(...) is 4 (characters)
# range(len(numStr)) is actually range(4) which is 0,1,2,3 (n)
# when n = 0, numStr[n] is actually numStr[0] which gives us the first character
# when n = 1, ....[n].....[1]..... second...
# If more comfortable with using index and [], version 2 easir to follow.
```

Enter a number: 5555

Sum of all digits is 20

```
'''
while Loop
Ask user to enter a number (repeatedly), add this number to a variable called
total
Keep looping as long as total is < 10
After the loop, print the value of total

Add a variable: count to keep track of the number of times the Loop is executed
Print the value after the Loop

# Currently, the loop will continue as long as total is less than 10
# Put it other way, the loop will stop when total >= 10
# Modify the loop so that the loop will stop when either one of the following is
true
# total >= 10 or count > 5
'''
total = 0 # This will be the sum of all numbers
count = 0 # This is for counting
# Keep reading and adding with a loop

# Summary: while loop is like if statement in the sense that you can test
# multiple condtions.

while total < 10 and count < 5: # Both conditions must be true in order to repeat
loop
    num = int(input("Enter a number: ")) # Read one number (convert to int)

    total = total + num  # Add to the total
```

```
    count = count + 1    # Add 1 for each iteration

# Print result after loop
print(total)
print(count)

Enter a number: 1
Enter a number: 1
Enter a number: 1
Enter a number: 1
Enter a number: 1
5
5
```