In [ ]:
```
#looping
#executing code multiple times.

#use FOR when number of iterations are KNOWN and can be counted.
#use WHILE when number of iterations not KNOWN (usually use a BOOLEAN value)


#MUST BE

#Initialise
#Test
#Increment
```

In [ ]:
```
#want to print the numbers from 1 .. 10?
#what is the start number of the LOOP
#what is the terminating number of the LOOP
#what is the increment
for icount in range (1,10):
    print(icount)
```

In [ ]:
```
#want to print the numbers from 1 .. 10 but only odd numbers?
for icount in range (0,13,3):
    print(icount)
```

In [ ]:
```
#use the FOR to repeat when the NUMBER OF ITERATIONS are known
#the FOR loop is controlled by a count
#the control variable is tested at the start of the FOR loop
for icount in range(1,12,3):
    print(icount)
    #print('in loop')

#print('hello out loop \n')
print('X')
```

Problem. Change the program below to prompt the user for input. Add the comments for input, process and output

In [ ]:
```
#use the FOR to repeat when the NUMBER OF ITERATIONS are known
#the FOR loop is controlled by a count
#the control variable is tested at the start of the FOR loop
istart=int(input('provide start number : '))
iend=int(input('provide end number : '))
for icount in range(istart,iend,5):
    print(icount)
```

Problem. Change the program below to prompt the user for input. Provide a meaningful message for the user.

In [ ]:
```
#use the FOR to repeat when the NUMBER OF ITERATIONS are known
#the FOR loop is controlled by a count
#the control variable is tested at the start of the FOR loop
for icount in range(2,11,5):
    print(icount)
```

In [ ]:
```
#use the FOR to repeat when the NUMBER OF ITERATIONS are known
#the FOR loop is controlled by a count
#the control variable is tested at the start of the FOR loop
for icount in (2,3,4,5):
    print(icount)
```

In [ ]:
```
#use the FOR to repeat when the NUMBER OF ITERATIONS are known
#the FOR loop is controlled by a count
#the control variable is tested at the start of the FOR loop
for icount in (34, 99, 44,77):
    print('the number is: ', icount)
```

In [ ]:
```
#use the WHILE to repeat when the NUMBER OF ITERATIONS are UNKNOWN
#the WHILE loop is controlled by a BOOLEAN
#the control variable is tested at the start of the WHILE loop

#NO NO NO NO  INFINITE ........................................
#icount=8
#while icount <= 10 :
#    print(icount)
```

In [ ]:
```
#use the WHILE to repeat when the NUMBER OF ITERATIONS are UNKNOWN
#the WHILE loop is controlled by a BOOLEAN
#the control variable is tested at the start of the WHILE loop
#control variable must be controlled!!!!!!! intialise/increment OR infinity!

#initialise
icount=2
#test
while icount < 10 :
    print(icount)
    #increment
    icount=icount + 3

print('while loop done')
```

In [ ]:
```
#use the WHILE to repeat when the NUMBER OF ITERATIONS are UNKNOWN
#the WHILE loop is controlled by a BOOLEAN
#the control variable is tested at the start of the WHILE loop
#control variable must be controlled!!!!intialise/increment OR infinity!

#initialise
icount=8
#test
while icount <= 10 :
    print(icount)
    #increment
    icount=icount + 1
```

In [ ]:
```
#enhancement
sessions = ['python', 'basics', 'advanced', 'cyber']
for xxxx in sessions:
    print(xxxx)
```

In [ ]:
```
#enhancement
sessions = ['python', 'basics', 'advanced', 'cyber']
for session in sessions:
    print(session.title() + " was a great session. Really learnt alot!")
```

In [ ]:
```
#enhancement
sessions = ['python', 'basics', 'advanced', 'cyber']
for session in sessions:
    print(session.title() + " was a great session. Really learnt alot!")
    #print('Thank You for sharing')
print('Thank You for sharing \n')
```

In [ ]:
```
#initialise
icount=20
#PMG changed this to 100 on 20210318
while icount <100:
    print(icount)
    icount = icount + 20
    #print('in loop')
print('Transaction completed')
```

In [ ]:
```
#write a program to count for 1 to 10
for inumber in range (1,11,2):
    print(inumber)
```

In [ ]:
```
#write a program to count from 10 to 1
```

In [ ]:
```
#write a program to ask the user for a number for from 1 to 10.  The output mu
st be the times table for that number ...
nNumber = int(input('Please give a number : '))
for icount in range (1,11):
    nCalc = nNumber * icount
    print('the number ', nCalc)
print('Thank YOU')
```

In [ ]:
```
#write a program that calculates the squares of each of the number from 1 to 1
0
for icount in range (1,11):
    nCalc=icount*icount
    print('Square is :', nCalc)
```

In [ ]:
```
for mynumber in (1,12,7):
    print(mynumber)
```

Write a program to print the even numbers from a start number to an end number

In [ ]:

Write a program to print the odd numbers from a start number to an end number as input from the user.

In [ ]:

Write a program that uses a FOR loop. The program must prompt the digits of your ID number. The program must output each digit as well as the sum of the digits.

In [ ]:

Write a program that requests numbers as input from the user. Add these numbers. The WHILE loop must terminiate once the sum exceeds a SecretNumber variable value. Please make provision to avoid an infinte loop!

In [ ]: