LOOP PRACTICE

Example 1: What will be the output of the following code fragment ? Trace the program.

num = 6   
counter = 0   
while ( counter <= 6):

if (num % 2 == 0):

print (num)

counter = counter + 1

num=6

|  |  |  |
| --- | --- | --- |
| counter | counter<=6 | Loop body  if (num % 2 == 0):  print num  counter = counter + 1 |
| 0 | 0<=6 T | 6 |
| 1 | 1<=6 T | 6 |
| 2 | 2<=6 T | 6 |
| 3 | 3<=6 T | 6 |
| 4 | 4<=6 T | 6 |
| 5 | 5<=6 T | 6 |
| 6 | 6<=6 T | 6 |
| 7 | 7<=6 FALSE loop is terminated |  |

6

6

6

6

6

6

6

Example 2: What is the output? Trace the program

num=6  
counter = 0   
while ( counter <= 6):

if (counter % 2 == 0):

print (num)

counter = counter + 1

|  |  |  |
| --- | --- | --- |
| counter | counter<=6 | Loop body  if (counter % 2 == 0):  print num  counter = counter + 1 |
| 0 | 0<=6 T | 0%2==0 T 6 |
| 1 | 1<=6 T | 1%2==0 FALSE nothing is printed!!!! |
| 2 | 2<=6 T | 2%2==0 T 6 |
| 3 | 3<=6 T | 3%2==0 FALSE nothing is printed!!! |
| 4 | 4<=6 T | 4%2==0 T 6 |
| 5 | 5<=6 T | 5%2==0 FALSE |
| 6 | 6<=6 T | 6%2==0 T 6 |
| 7 | 7<=6 FALSE loop is terminated |  |

6

6

6

6

**We print 6 ONLY when counter is EVEN**

The program prints the value of num for the even values of counter

Example 3:

What is the output of the following program, if the input was: **5 -4 6 -7 8**?   
num = 5   
counter = 0   
while (counter < num):

current = int(input ("Please enter the number "))

if (current < 0):

print (current)

counter = counter + 1

input: **5 -4 6 -7 8**

|  |  |  |
| --- | --- | --- |
| **counter** | counter < num  counter < 5 | Loop body  current = input ("Please enter the number ")  if (current < 0):  print current  counter = counter + 1 |
| 0 | t | current=5, if(5<0) FALSE  nothing to print  counter=0+1=1 |
| 1 | t | current = -4 if(-4<0) TRUE  print -4  counter=1+1=2 |
| 2 | t | current=6 if(6<0) FALSE nothing to print  counter=2+1=3 |
| 3 | t | current=-7 if(-7<0) TRUE  print -7  counter =3+1=4 |
| **4** | **t** | current=8  if(8<0) FALSE nothing to print  counter=4+1=5 |
| 5 | FALSE loop is terminated |  |

Output:

-4

-7

The program prints NEGATIVE inputs

Example 4: What will be the output of the following program, if the input was 1 -3 4 5 -9 7 0? TRACE the program

a = 1   
sum = 0   
while (a != 0):

a = int(input ("enter the number "))

if a > 0:

sum = sum + a

print("sum is ", sum)

|  |  |  |
| --- | --- | --- |
| a | a!=0 | a = int(input ("enter the number "))  if a > 0:  sum = sum + a |
| 1 | 1!=0 T | a=1, 1>0 T sum=sum+a=0+1=1 |
| 1 | 1!=0 T | a=-3, -3>0 FALSE we are not adding -3 to the sum |
| -3 | -3!=0 T | a=4, 4>0 T sum=1+4=5 |
| 4 | 4!=0 T | a=5, 5>0 T sum=5+5=10 |
| 5 | 5!=0 T | a=-9, -9>0 FALSE no update for the sum |
| -9 | -9!=0 T | a=7 7>0 T sum=10+7=17 |
| 7 | 7!=0 T | a=0 0>0 FALSE |
| 0 | 0!=0 FALSE | LOOP IS TERMINATED |

sum is 17

The program reads integers until 0 is entered and adds positive inputs