



# CPIT 110

## Instructor Manual

For **50** Minutes Lectures

# Week 10

03/11/2019 – 07/11/2019

## Chapter 5

### Loops

This Week Events	– Lab #7 (Chapter 5 Part 1)
Next Week Events	– Lab #8 (Chapter 5 Part 2)

## CPIT 110

### Instructor Manual – Lecture #1 in Week 10

Chapter	5. Loops
Number of Lectures	3 (50 minutes / Lecture)
Lecture	3 of 6
Slides	67 - 95
Date	Sunday 03/11/2019

Week  
**10**

Lecture  
**3 of 6**

Slides  
**67 - 95**

## Topics to Be Covered

### ❖ 5.3. The for Loop

## Learning Objectives

Learning Outcomes	Topics
– To use for loops to implement counter-controlled loops.	5.3. The for Loop

## Exercises

### ❖ 5.3. The for Loop

1. Suppose the input is 2 3 4 5 0 (one number per line). What is the output of the following code?

```
1 number = 0
2 sum = 0
3
4 for count in range(5):
5     number = eval(input("Enter an integer: "))
6     sum += number
7
8 print("sum is", sum)
9 print("count is", count)
```

2. Can you convert any for loop to a while loop? List the advantages of using for loops.
3. Convert the following for loop statement to a while loop:

```
1 sum = 0
2 for i in range(1001):
3     sum = sum + i
```

4. Can you always convert any while loop into a for loop? Convert the following while loop into a for loop:

```
1 i = 1
2 sum = 0
3 while sum < 10000:
4     sum = sum + i
5     i += 1
```

5. Count the number of iterations in the following loops:

<pre>count = 0 while count &lt; n:     count += 1</pre>	<pre>for count in range(n):     print(count)</pre>
<pre>count = 5 while count &lt; n:     count += 1</pre>	<pre>count = 5 while count &lt; n:     count = count + 3</pre>

## CPIT 110

### Instructor Manual – Lecture #2 in Week 10

Chapter	5. Loops
Number of Lectures	3 (50 minutes / Lecture)
Lecture	4 of 6
Slides	96 - 130
Date	Tuesday 05/11/2019

<b>Week</b> <b>10</b>	Lecture <b>4 of 6</b>
	Slides <b>96 - 130</b>

### Topics to Be Covered

- ❖ 5.4. Nested Loops
- ❖ 5.5. Minimizing Numerical Errors
- ❖ 5.6. Case Studies [...]

### Learning Objectives

Learning Outcomes	Topics
– To write nested loops.	5.4. Nested Loops
– To learn the techniques for minimizing numerical errors.	5.5. Minimizing Numerical Errors
– To learn loops from a variety of examples.	5.6. Case Studies [...]

## Exercises

### ❖ 5.4. Nested Loops

1. Show the output of the following programs. (Hint: Draw a table and list the variables in the columns to trace these programs).

<pre>for i in range(1, 5):     j = 0     while j &lt; i:         print(j, end = " ")         j += 1</pre>	<pre>i = 0 while i &lt; 5:     for j in range(i, 1, -1):         print(j, end = " ")     print("****")     i += 1</pre>
<pre>i = 5 while i &gt;= 1:     num = 1     for j in range(1, i + 1):         print(num, end = "xxx")         num *= 2     print()     i -= 1</pre>	<pre>i = 1 while i &lt;= 5:     num = 1     for j in range(1, i + 1):         print(num, end = "G")         num += 2     print()     i += 1</pre>

2. If you think that a divisor for a number  $n1$  cannot be greater than  $n1 / 2$ , you might attempt to improve the program using the following loop. This revision is wrong. Can you find the reason?

```
1 k = 2
2 while k <= and k <= :
3     if n1 % k == 0 and n2 % k == 0:
4         gcd = k
5         k += 1
```

## CPIT 110

### Instructor Manual – Lecture #3 in Week 10

Chapter	5. Loops
Number of Lectures	3 (50 minutes / Lecture)
Lecture	5 of 6
Slides	131 - 160
Date	Thursday 07/11/2019

Week  
**10**

Lecture  
**5 of 6**

Slides  
**131 - 160**

### Topics to Be Covered

#### ❖ 5.6. Case Studies [...Continued]

### Learning Objectives

Learning Outcomes	Topics
– To learn loops from a variety of examples.	5.6. Case Studies [...Continued]

### Exercises

No exercises.