



CPIT 110

Instructor Manual

For **50** Minutes Lectures

Week 7

13/10/2019 – 17/10/2019

Chapter 4

Selections

This Week Events	<ul style="list-style-type: none">– Lab #6 (Chapter 4)
Next Week Events	<ul style="list-style-type: none">– Mid-Term Exam 1 - Part 1 (Week #8)– Mid-Term Exam 1 - Part 2 (Week #9)

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Instructor Manual – Lecture #1 in Week 7

Chapter	4. Selections
Number of Lectures	3 (50 minutes / Lecture)
Lecture	3 of 6
Slides	59 - 88
Date	Sunday 13/10/2019

Week 7	Lecture 3 of 6
	Slides 59 - 88

Topics to Be Covered

- ❖ 4.7. Nested if and Multi-Way if-elif-else Statements
- ❖ 4.8. Common Errors in Selection Statements

Learning Objectives

Learning Outcomes	Topics
– To implement selection control with nested if and multi-way if-elif-else statements.	4.7. Nested if and Multi-Way if-elif-else Statements
– To avoid common errors in if statements.	4.8. Common Errors in Selection Statements

Exercises

❖ 4.7. Nested if and Multi-Way if-elif-else Statements

1. Suppose $x = 3$ and $y = 2$; show the output, if any, of the following code. What is the output if $x = 3$ and $y = 4$? What is the output if $x = 2$ and $y = 2$? Draw a flowchart for the code:

```

1  if x > 2 :
2      if y > 2 :
3          z = x + y
4          print("z is", z)
5  else:
6      print("x is", x)

```

2. Suppose $x = 2$ and $y = 4$. Show the output, if any, of the following code. What is the output if $x = 3$ and $y = 2$? What is the output if $x = 3$ and $y = 3$? (Hint: Indent the statement correctly first.):

```
1 if x > 2 :
2     if y > 2 :
3         z = x + y
4         print("z is", z)
5     else:
6         print("x is", x)
```

3. What is wrong in the following code?

```
1 if score >= 60.0 :
2     grade = 'D'
3 elif score >= 70.0 :
4     grade = 'C'
5 elif score >= 80.0 :
6     grade = 'B'
7 elif score >= 90.0 :
8     grade = 'A'
9 else :
10    grade = 'F'
```

❖ 4.8. Common Errors in Selection Statements

1. Rewrite the following statement using a Boolean expression:

```
1 if count % 10 == 0:
2     newLine = True
3 else:
4     newLine = False
```

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Instructor Manual – Lecture #2 in Week 7

Chapter	4. Selections
Number of Lectures	3 (50 minutes / Lecture)
Lecture	4 of 6
Slides	89 - 123
Date	Tuesday 15/10/2019

Week 7	Lecture 4 of 6
	Slides 89 - 123

Topics to Be Covered

- ❖ 4.9. Case Study: Computing Body Mass Index
- ❖ 4.11 Logical Operators

Topics Not to Be Covered

- ❖ 2.10. Case Study: Computing Taxes
 - Listing 4.7

Learning Objectives

Learning Outcomes	Topics
– To program with selection statements.	4.9. Case Study: Computing Body Mass Index
– To combine conditions using logical operators (and, or, and not).	4.11. Logical Operators

Exercises

❖ 4.9. Case Study: Computing Body Mass Index

1. Are the following two statements equivalent?

```
if income <= 10000:
    tax = income * 0.1
elif income <= 20000:
    tax = 1000 + \
        (income - 10000) * 0.15
```

```
if income <= 10000:
    tax = income * 0.1
elif income > 10000 and income <= 20000:
    tax = 1000 + \
        (income - 10000) * 0.15
```

2. What is wrong in the following code?

```
1 income = 232323
2 if income <= 10000:
3     tax = income * 0.1
4 elif income > 10000 and income <= 20000:
5     tax = 1000 + (income - 10000) * 0.15
6 print(tax)
```

❖ 4.11. Logical Operators

1. Assuming that x is 1, show the result of the following Boolean expressions:

- True and (3 > 4)
- not (x > 0) and (x > 0)
- (x > 0) or (x < 0)
- (x != 0) or (x == 0)
- (x >= 0) or (x < 0)
- (x != 1) == not (x == 1)

2. Write a Boolean expression that evaluates to True if variable `num` is between 1 and 100.

3. Write a Boolean expression that evaluates to True if variable `num` is between 1 and 100 or the number is negative.

4. Assuming x is 4 and y is 5, show the result of the following Boolean expressions:

- $x \geq y \geq 0$
- $x \leq y \geq 0$
- $x \neq y == 5$
- (x != 0) or (x == 0)

5. Are the following expressions equivalent?

- (a) (x >= 1) and (x < 10)
- (b) (1 <= x < 10)

6. Suppose, when you run the following program, you enter input 2, 3, 6 from the console. What is the output?

```
1 x, y, z = eval(input("Enter three numbers: "))
2 print("(x < y and y < z) is", x < y and y < z)
3 print("(x < y or y < z) is", x < y or y < z)
4 print("not (x < y) is", not (x < y))
5 print("(x < y < z) is", x < y < z)
6 print("not(x < y < z) is", not (x < y < z))
```

7. Write a Boolean expression that evaluates true if **age** is greater than 13 and less than 18.
8. Write a Boolean expression that evaluates true if **weight** is greater than 50 or **height** is greater than 160.
9. Write a Boolean expression that evaluates true if **weight** is greater than 50 and **height** is greater than 160.
10. Write a Boolean expression that evaluates true if either **weight** is greater than 50 or **height** is greater than 160, but not both.

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Instructor Manual – Lecture #3 in Week 7

Chapter	4. Selections
Number of Lectures	3 (50 minutes / Lecture)
Lecture	5 of 6
Slides	124 - 138
Date	Thursday 17/10/2019

Week 7	Lecture 5 of 6
	Slides 124 - 138

Topics to Be Covered

- ❖ 4.12. Case Study: Determining Leap Years
- ❖ 4.13. Case Study: Lottery

Learning Objectives

Learning Outcomes	Topics
– To use selection statements with combined conditions.	4.12. Case Study: Determining Leap Years 4.13. Case Study: Lottery

Exercises

No Exercises