

**Csci 1523**

**Spring 2015**

**Study Guide - Chapter 3 Dierbach**

**Assigned: 2/08/16**

**Due: 2/22/16**

**Student (Print):** \_\_\_\_\_

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This study guide contains ?? pages (including this cover page) and ?? problems. Check to see if any pages are missing. Enter all requested information on the top of this page, and put your initials on the top of every page, in case the pages become separated.

You may use your books, notes, calculator or internet sources while completing this study guide.

Please try to answer the sections clearly and PRINT your answers legibly.

### Chapter 3 Study Guide

As described in your text control structures are categorized into 3 groups:

1. **Sequence** - each instruction executes in the order encountered.
2. **Selection** - the flow of execution is altered depending on logical conditions encountered during program execution.
3. **Iterative** - the flow of execution results in a set of instructions being repeated with the number of repetitions dependent on a logical condition.

Below find a set of questions concerning the syntax and behavior of each of the control structures. Use your text or other resources when answering each of these.

1. A program which consists of a set of instructions which does not contain either a selection or iteration structure is called a:

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2. Explain briefly in the space below what is meant by a *sequence structure*

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3. Explain in the space provided below the difference between a *control statement* and a *control structure*

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4. In Python a boolean data type contains one of two values. From the choices below select the values that are implemented in Python:

- A. TRUE
- B. true
- C. True
- D. 1

- E. FALSE
  - F. false
  - G. False
  - H. 0
5. Relational expressions evaluate to:
- A. Either 0 or 1
  - B. True or False
  - C. An alphanumeric, depending on the expressions
  - D. Nothing, they just change the order of operations
  - E. None of the above
6. Which of the following is the *"is not equal to"* relational operator:
- A. ==
  - B. !=
  - C. >
  - D. <
  - E. >=
  - F. <=
  - G. <>
  - H. eq
  - I. neq
7. Which of the following is the *"is equal to"* relational operator:
- A. ==
  - B. =
  - C. !=
  - D. >
  - E. <
  - F. <>
  - G. eq
  - H. neq
8. Which of the following is the *"greater than or equal to"* relational operator:
- A. ==
  - B. =
  - C. !=



12. Complete the truth tables shown below:

Boolean "or" operator:

<i>Arg 1</i>	<i>Arg 2</i>	<i>Result</i>
True	True	
True	False	
False	True	
False	False	

Boolean "and" operator:

<i>Arg 1</i>	<i>Arg 2</i>	<i>Result</i>
True	True	
True	False	
False	True	
False	False	

13. Looking over the tables completed in the previous question explain the function of a "short circuited" operator in Python in the context of those tables:

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14. In the space provided below list the arithmetic, logical and relational operators defined in the Python language in order of their execution precedence, (See Figure 3-6 in your text):

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15. Define a *selection* control statement:

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16. Given the code listing shown below:

Listing 1: *if* structure and relational operators

```
1 exam_score = 65
2 student_present = True
3
4 if (exam_score > 89 and student_present):
5     grade = 'A'
6 elif (exam_score > 79 and student_present):
7     grade = 'B'
8 elif (exam_score > 69 and student_present):
9     grade = 'C'
10 elif (exam_score > 59 and student_present):
11     grade = 'D'
12 else:
13     grade = 'F'
14
15 print(grade)
```

(a) What value will be output to the terminal:

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- (b) Rewrite the code segment given above using *nested if-else* statements in place of the *elif* blocks:

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17. In Python we use logic structures which contain *headers* and *clauses*. In the space provided describe each:

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18. Which of the following are *headers* in Python:

- A. `y = True`
- B. `if (condition):`
- C. `x not z`
- D. `else:`
- E. `int`
- F. `str`
- G. `elif:`
- H. None of the above.
- I. All of the above.

19. What is an *iterative* control structure:

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.....  
.....  
.....

20. List the *iterative* control structures implemented in Python:

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.....  
.....  
.....

21. Given the code listing shown below:

Listing 2: *if* structure and relational operators

```
1 i = 6
2
3 while (i >= 0):
4     j = i + i
5     i -= 1
6 print (i, j)
```

(a) When the *while* structure terminates, what values print out for *i* and *j*:

.....  
.....

(b) Suppose we change the value of *i* in the example above to 19, what values print out for *i* and *j*:

.....  
.....

22. Infinite loops:

(a) What is an *infinite* loop:

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(b) Give a coding scenario in which we would like to implement an *infinite* loop:

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.....  
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- (c) In Listing 2 above which line would need to be modified in order that it would become an infinite loop:

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