

## 2.9 Exercises

### Review Questions

#### True/False

1. The best way to write a program is to immediately type in some code and then debug it until it works. **False**
2. An algorithm can be written without using a programming language. **True**
3. Programs no longer require modification after they are written and debugged. **False**
4. Python identifiers must start with a letter or underscore. **True**
5. Keywords make good variable names. **False**
6. Expressions are built from literals, variables, and operators. **True**
7. In Python,  $x = x + 1$  is a legal statement. **True**
8. Python does not allow the input of multiple values with a single statement. **False**
9. A counted loop is designed to iterate a specific number of times. **True**
10. In a flowchart, diamonds are used to show statements, and rectangles are used for decision points. **False**

#### Multiple Choice

1. Which of the following is *not* a step in the software development process?  
 a) Specification    b) Testing/Debugging  
 c) Fee setting    d) Maintenance    **C**
2. What is the correct formula for converting Celsius to Fahrenheit?  
 a)  $F = 9/5(C) + 32$     b)  $F = 5/9(C) - 32$   
 c)  $F = B^2 - 4AC$     d)  $F = \frac{212-32}{100-0}$     **A**
3. The process of describing exactly *what* a computer program will do to solve a problem is called  
 a) design    b) implementation    c) programming    d) specification    **D**

4. Which of the following is *not* a legal identifier?  
a) spam    b) spAm    c) 2spam    d) spam4U    **C**
5. Which of the following are *not* used in expressions?  
a) variables    b) statements    c) operators    d) literals    **B**
6. Fragments of code that produce or calculate new data values are called  
a) identifiers    b) expressions  
c) productive clauses    d) assignment statements    **D**
7. Which of the following is *not* a part of the IPO pattern?    **B**  
a) Input    b) Program    c) Process    d) Output
8. The template for `<variable> in range(<expr>)` describes  
a) a general for loop    b) an assignment statement  
c) a flowchart    d) a counted loop    **A**
9. Which of the following is the most accurate model of assignment in Python?  
a) sticky-note    b) variable-as-box  
c) simultaneous    d) plastic-scale    **B**
10. In Python, getting user input is done with a special expression called  
a) for    b) read    c) simultaneous assignment    d) input    **D**

### Discussion

1. List and describe in your own words the six steps in the software development process.
2. Write out the `chaos.py` program (Section 1.6) and identify the parts of the program as follows:
  - Circle each identifier.
  - Underline each expression.
  - Put a comment at the end of each line indicating the type of statement on that line (output, assignment, input, loop, etc.)
3. Explain the relationships among the concepts: definite loop, for loop, and counted loop.
4. Show the output from the following fragments: