Logic Chapter 6

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Short Answer:

**2. What three characteristics of a function are described in an IPO chart?**

The three characteristics of a function are the input, process and the output. The input is what you feed into the function, the process is where the function does its thing following whatever is coded there and then lastly the output is the result of the functions operations on the input.

**5. What is the purpose of the stringToInteger and stringToReal functions described in this chapter?**

Some programs must read data from a source that can provide input only as strings. Very common with programs that read data from files. In addition, some languages only read keyboard input as strings. Due to this, numbers that are read as an input initially come into the program as strings and have to be converted to a numeric data type. Most programming languages have library functions that convert strings to numbers which is the purpose of stringToInteger and stringToReal.

**6. What is the purpose of the isInteger and isReal functions described in this chapter?**

To help prevent errors when converting strings to numbers, many programming languages provide library functions that test a string and then return a true or false indicating whether the string can be successfully converted to a number.

**Algorithm Workbench**

1. **As shown in this chapter, write a pseudocode statement that generates a random number in the range of 1 through 100 and assigns it to a variable named rand.**

// rand variable

Declare Integer rand

// This loop generates a random number in the range of 1 through 100

Set rand = random(1, 100)

**Debugging Exercises**

**1.The programmer intends for this pseudocode to display three random numbers in the range of 1 through 7. According to the way we’ve been generating random numbers in this book, however, there appears to be an error. Can you find it?**

***// This program displays three random numbers***

***// in the range of 1 through 7.***

***Declare Integer count***

***//Display three random numbers.***

***For count = 1 to 3***

***Display random(7, 1)***

***End for***

The problem lies within the Display random (7, 1) line. Since the question wants us to display 3 random numbers in the range 1 through 7 the arguments should be (1, 7) instead of (7, 1). The corrected code would be

***//Display three random numbers.***

***For count = 1 to 3***

***Display random(1, 7)***

***End for***

1. **Can you find the reason that the following pseudocode function does not return the value indicated in the comments?  
     
   // The calcDiscountPrice function accepts an item’s price and**

**// the discount percentage as arguments. It uses those**

**// values to calculate and return the discounted price.**

**Function Real calcDiscountPrice(Real price, Real percentage)**

**// Calculate the discount.**

**Declare Real discount = price \* percentage**

**// Subtract the discount from the price.**

**Declare Real discountPrice = price - discount**

**// Return the discount price**

**Return discount**

**End Function**

The problem lies in the “Return discount” line due to the comments wanting the actual discounted price and not just the discount amount as the code would’ve displayed. The corrected code would be   
  
 **// Return the discount price**

**Return discountPrice**

**End Function**