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Logic Chapter 2

**Short Answers**

1.

**What does a professional programmer usually do first to gain an understanding of a problem?**

*The programmer needs to identify the problem through debugging the code. Programmers never just jump straight in and start writing code first they have to create a design for their program that’s solving whatever issue it’s supposed to.*

4. **What does the term “user-friendly” mean?**

*“Easy to use”*. This typically refers to technology that is intuitive to use so you don’t spend a long time trying to figure it out. Apple products are a good example of user-friendly tech since kids can use them.

6. **What value is stored in uninitialized variables?**

Undefined. It’s basically a container that has zero value. Nothing in it basically.

**Algorithm Workbench**

**3.**

**Write assignment statements that perform the following operations with variables a and b.**

A. Adds 2 to “a” and stores the result in “b”

b = a + 2

B. Multiples “b” times 4 and stores the result in “a”

a = b \* 4

C. Divides “a” by 3.14 and stores the result in “b”

b = a / 3.14

D. Subtracts 8 from “b” and stores the result in “a”

a = b - 8

**4.**

**Assume the variable results, x, y and z are all integers, and that x = 4, y = 8, and z = 2.  
What value will be stored in the result in each of the following statements**  
A. Set result = x + y

*result = 12*

B: Set result = z \* 2

*result = 4*

C: Set result = y / x

*result = 2*

D: Set result = y - z

*result = 6*

**8.**

**Write a pseudocode statement that assigns the sum of 10 and 14 to the variable total**

BEGIN   
 VAR total  
 SET total = 10 + 14  
 PRINT total  
END

11.

**If the following pseudocode were an actual program, what would it display?**

Declare Integer a = 5

Declare Integer b = 2

Declare Integer c = 3

Declare Integer result

Set result = a + b \* c

Display result

*It would display 11*  
  
  
**Debugging Exercises  
  
2. If the programmer translates the following pseudocode to an actual programming language, a syntax error is likely to occur. Can you find the error?**

Declare String 1stPrize  
  
Display “Enter the award for first prize.”

Input 1stPrize

Display “The first prize winner will receive”, 1stPrize

*The issue lies with the word “1stPrize”. It should be firstPrize and not a number.*  
 **3. The following code will not display the results expected by the programmer. Can you find the error?**  
  
Declare Real Lowest, highest, average

Display “Enter the lowest score.”

Input lowest

DIsplay “Enter the highest score.”

Input highest

Set average = low + high / 2

Display “The average is ”, average, “.”

*The first thing I noticed is that we defined lowest and highest but not high and low so it throws an error since it’s not declared.*

**5.Find the error in the following pseudocode.**

Declare Integer value1, value2, value3, sum

Set sum = value1 + value2 + value3

Display “Enter the first value.”

Input value1

Display “Enter the second value.”

Input value2

Display “Enter the third value.”

Input value3

Display “The sum of numbers is”, sum

*It doesn’t work because it tries to read data from a variable before any data was stored in it.*  
  
  
**Programming Exercises  
  
3. Land Calculation   
One acre of land is equal to 43,560 square feet. Design a program that asks the user to enter the total square feet in a tract of land and calculates the number of acres in the tract.**

**4. Total Purchase**

**A customer in a store is purchasing five items. Design a program that asks for the price of each item, and then displays the subtotal of the sale, the amount of sales tax, and the total. Assume the sales tax is 6 percent.**

**8. Tip, Tax, and Total**

**Design a program that calculates the *total amount* of a meal purchased at a restaurant. The program should ask the user to enter the charge for the food, and then calculate the amount of a 15 percent tip and 7 percent sales tax. Display each of these amounts and the total.**

**9. Weight Loss**

**If a moderately active person cuts their calorie intake by 500 calories a day, he or she can typically lose about 4 pounds a month. Write a program that has the user enter their starting weight and then displays a table showing what their expected weight will be at the end of each month for the next 6 months if they stay on this diet.**