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Programming Concepts Chapter 6 Problems

3. Math Quiz Design a program that gives simple math quizzes. The program should display two random numbers that are to be added, such as: 247 + 129 The program should allow the student to enter the answer. If the answer is correct, a message of congratulations should be displayed. If the answer is incorrect, a mes- sage showing the correct answer should be displayed.

Start

Declare Integer number1

Declare Integer number2

Declare integer Sum

Set number1 = random(1, 1000)

Set number2= random(1, 1000)

Set Sum=0

Display number1

Display number2

Display “What is the sum of number one and number 2”

Input Sum

Function integer sum( number1 , number2)

Declare integer Result

Set Result = number1 + number2

Return Result

End Function

If Result==Sum

Display “Congratulations You are Correct”

Else

Display “The correct answer was” Result

End IF

End

8. Odd/Even Counter In this chapter you saw an example of how to design an algorithm that determines whether a number is even or odd (see Returning Boolean Values in Section 6.2). Design a program that generates 100 random numbers, and keeps a count of how many of those random numbers are even and how many are odd.

Start

Declare Integer count

Declare integer evenNumbers

Declare integer oddNumbers

Set count=0

Set evenNumbers=0

Set oddNumbers=0

While count <= 100

Declare integer randomNumber

Set randomNumber= random( 1 , 1000)

IF MOD randomNumber = 0

Set evenNumbers = evenNumbers + 1

Else

Set oddNumbers = oddNumbers + 1

End IF

Set count = count + 1

End While

Display “The total amount of Even Numbers is:” evenNumbers

Display “The total amount of Odd Numbers is:” oddNumbers

End

11. Rock, Paper, Scissors Game Design a program that lets the user play the game of Rock, Paper, Scissors against the computer. The program should work as follows:

(1) When the program begins, a random number in the range of 1 through 3 is generated. If the number is 1, then the computer has chosen rock. If the num- ber is 2, then the computer has chosen paper. If the number is 3, then the computer has chosen scissors. (Don’t display the computer’s choice yet.)

(2) The user enters his or her choice of “rock,” “paper,” or “scissors” at the keyboard.

(3) The computer’s choice is displayed.

(4) The program should display a message indicating whether the user or the computer was the winner. A winner is selected according to the following rules:

● If one player chooses rock and the other player chooses scissors, then rock wins. (The rock smashes the scissors.)

● If one player chooses scissors and the other player chooses paper, then scissors wins. (Scissors cut paper.)

● If one player chooses paper and the other player chooses rock, then paper wins. (Paper wraps rock.)

● If both players make the same choice, the game must be played again to determine the winner