do while Loops

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November 23, 2021 (02:24:03 PM)

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# Do while Loops

Before writing code, think through the following problems:

* In your own words, what is the difference between while and do while loops?
* Can you think of a problem where
  + using while is preferable over do while?
  + using do while is preferable over while?

## Implementing do while Loops

In all the problems in this section, use a do while loop.

1. Write a program that displays the numbers 0 to 50.
2. Write a program that displays the numbers 30 to -20.
3. Write a do while loop that generates this output:

* 1 10 100 1000 10000 100000 1000000

In the next problem, implement a program combining a do-while loop with user input to achieve the following behavior:

1. Ask user to enter an integer in the range 0 - 100 (including 0 and 100).
2. If the value provided by user is not in this range, the program should repeat the question.
3. After the user provides an integer within the range, display that number.

Here is an example of a possible interaction with the program:

Enter an integer between 0 and 100: NO  
Sorry, that is not a valid input.  
  
Enter an integer between 0 and 100: -20  
Sorry, that is not a valid input.  
  
Enter an integer between 0 and 100: 42  
You entered 42.

# while vs do while

Consider the program given below implemented using a while loop:

int n;  
bool flag = false;  
  
Console.Write("Enter an integer:");  
flag = int.TryParse(Console.ReadLine(), out n);  
  
while(!flag)  
{  
 Console.WriteLine("The value you entered is not a valid integer. Try one more time.");  
 Console.Write("Enter an integer:");  
 flag = int.TryParse(Console.ReadLine(), out n);  
}  
  
Console.WriteLine($"The number you entered is {n}");

1. Convert the program to an equivalent version that uses a do while loop
2. Test the do while version with different inputs to ensure the behavior is the same and that the program does not crash with an error. For example, you should try:
   * alphabetic input (invalid)
   * floating point input (invalid)
   * negative integer (valid)
   * positive integer (valid)
   * number 0 (valid)
3. Compare the while and do while implementations: which one is better, in your opinion, and why?