2024-11-19

# Recursion

[Solutions for those exercises.](https:///princomp.github.io/solutions/control/recursion)

## Multiple Choices

1. What is the simplest definition of recursion?
	* A method is recursive if it does not take arguments.
	* A property is recursive if it has a backing field.
	* A method is recursive if it calls itself.
	* A method is recursive if it calls a constructor.
	* A class is recursive if it inherits from another class.
2. Consider the following code:
* void Test(int n)
 {
 if (n != 0){
 Console.Write($"{n} ");
 Test(n - 1);
 }
 }
Test(3);
* What will it display?
	+ Nothing
	+ n
	+ 3 2 1
	+ 3 2 1 0
	+ 3 2 1 0 -1 -2 -3 -4 -5 … until the program crashes.
	+ 2 1 0 -1 -2 -3 -4 -5 … until the program crashes.
	+ 1 2 3
	+ 0 1 2 3
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## Exercises

1. What would the following code display?
* int Myst1(int n)
{
 if (n != 0)
 {
 return n + Myst1(n - 1);
 }
 else
 {
 return n;
 }
}

Console.WriteLine(Myst1(4));
1. What would the following code display?
* void Myst2(int n)
{
 if (n == 0) { Console.WriteLine("Done"); }
 else if (n < 0)
 {
 Console.Write($"{n} ");
 Myst2(-n);
 }
 else
 {
 Console.Write($"{n} ");
 Myst2(-(n - 1));
 }
}
Myst2(3);
1. What would the following code display?
* void Myst3(int len)
{
 MystH(0, 1, 1, len);
}
void MystH(int axP, int bxP, int counter, int len)
{
 if (counter <= len)
 {
 Console.Write($"{axP} ");
 MystH(bxP, axP + bxP, counter + 1, len);
 }
}
Myst3(6);
1. Write a recursive method that takes an int as argument, generates a random int between 0 and this argument, displays it and calls itself with that number. The method should stop when the int generated is 0.
2. Write a recursive method that takes a string as argument and returns true if it is a palindrome. Your method should return true on input "civic", "noon", "radar" and "" (empty string), and false on input "test" and "not a palindrome".
3. Write a recursive method that takes an int as argument and returns the number of even digits in it. For example, on input 631, the method should return 1 since only 6 is even.