

CSE1322 – Assignment 4 – Recursion

Recursion Assignment 4

Objectives

- Apply recursion to a difficult problem.

Tasks

This lab has two parts:

1. Write a recursive method that converts a decimal number to a different base number system.
2. Print out the results after testing your method on a few different inputs.

Task 1 – Recursive Method

Create a recursive method that returns a given number converted from base ten to a given other base number system ranging from two to thirty-six. A decimal number, or base ten number, can be expressed in any other number system. The only difference is that different systems use different values for each digit. For instance, binary or base two, only has two possible digit values, zero (0) or one (1). Octal, base eight, has digits ranging from zero (0) to seven (7), and hexadecimal, base sixteen, has digits ranging from zero (0) to fifteen (which is shown as F). Notice that two, eight, ten, and sixteen are not part of their respective base number systems. Instead, those numbers are represented as (10) in each of their systems. So for base two 10 is two, for octal 10 is eight, for decimal 10 is ten, and for hexadecimal 10 is sixteen.

NOTE: Any number system greater than decimal uses capital letters as well as numbers. So hexadecimal has A which is ten, B which is eleven, C which is twelve, D which is thirteen, E which is fourteen, and F which is fifteen. This trend continues for number systems above hexadecimal as well.

HINT: The process to convert from decimal to any other base number system uses both division and modulus at each step, both of which will be done using the other base number. Also, the default calculator app on Windows is able to show the converted numbers for base two, eight, and sixteen from base ten, in case you'd like to check your output.

Task 2 – The Driver

Now we just need to call our method from our Main method and test it with a few different inputs (they may be hardcoded or from user input). Print out the results of each of the method calls along with the tested input decimal number and which base number system it was converted to.

∃ Some Sample Output:

753 in decimal is 1361 in base 8.
753 in decimal is 2F1 in base 16.
9098 in decimal is 12EI in base 20.
692 in decimal is 1010110100 in base 2.

What to Turn In:

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