### SIENA COLLEGE

**24th Annual**

### High School Programming Contest

##### April 8, 2011

###### **Problem #7: Kth Permuatation**

Background Information: A permutation of a set of N elements is a distinct ordering of those elements. For example, the set S = {a, b, c} has six different permutations indexed 1 to 6:

{a, b, c} {a, c, b} {b, a, c} {b, c, a} {c, a, b} {c, b, a}.

{a, b, c} is permutation 1, {a, c, b} is permutation 2 … and {c, b, a} is permutation 6

For this problem our set is the 16 hexidecimal digits {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F}.

This set can be permuted 16! ways with the first permutation < the second permutation and so on to the 16! = 20, 922, 789, 888, 000 permutation.

###### Programming Problem:

Input: N a positive integer less than or equal to 1, 307, 674, 369, 000.

Output: The Nth permutation of the set of hexadecimal digits.

###### Example 1: Input: 1

###### Output: 0 1 2 3 4 5 6 7 8 9 A B C D E F

###### Example 2: Input: 6

###### Output: 0 1 2 3 4 5 6 7 8 9 A B C F E D

###### Example 3: Input: 5000

###### Output: 0 1 2 3 4 5 6 7 8 F E C A 9 D B

###### Example 4: Input: 4000000000000

###### Output: 3 0 E 6 B 7 C A 2 9 8 4 D 5 F 1