**AP Computer Science** - Chapter 4 Programming Barometer

**Program # 1 - Palindrumber**

A palindrome is a word which is the same when spelled backwards. For example, the word racecar is a palindrome. Similarly, a palindrumber is a number which is the same when its digits are arranged backwards. (Ex: 92029) The smallest palindrumber made from the product of two 2-digit positive integers that has an even number of digits is 1001. (91 \* 11 = 1001) The smallest palindrumber made from the product of two 2-digit positive integers that has an odd number of digits is 121. (11 \* 11 = 121)

Write a java program to find the smallest palindrumber made from the product of three 3-digit positive integers that have even and odd numbers of digits. The program must calculate this value, not just report it.

The smallest palindrumber made from the product of three 3-digit positive integers with an even number of digits is <answer>.

The smallest palindrumber made from the product of three 3-digit positive integers with an odd number of digits is <answer>.

**Program # 2 - BaseConverter**

The user is prompted to enter a decimal value and the base of a number system to convert the number into. The program will then perform the conversion and output the newly converted number. If the base number system is greater than 10, you should use letters to present values. (A = 11, B = 12, C = 13, D = 14, E = 15, etc…)

Enter decimal number: 109 Enter a decimal number: 74 Enter a decimal number: 637

Enter base number system: 8 Enter the base number system: 2 Enter the base number system: 16

109 = 155 (base 8) 74 = 1001010 (base 2) 637 = 27D (base 16)

**Program # 3 - RandomPartners**

The user will enter in eight different names. Your program will make random partners of these eight individuals. The four groups of partners are outputted, with each person's name only being used one time. I will have you run your program 3 times to prove that is works and should get 3 different sets of partners with no repeats.

Enter 8 names separated by spaces: Tom Al Ed Sam Joe Gus Bo Ty

The following people are partners:

Ed and Gus

Bo and Tom

Sam and Al

Ty and Joe

**Program # 4 - NumberPyramid**

The user enters in the number of lines (1 to 9) that they wish to display of the following patterned number pyramid. Determine the pattern and output that many lines of the pyramid. The output of the pyramid should be centered in the console. You can assume the console will output text with a maximum length of 60 characters. Your program will also output how many spaces it used in before the first character of the last line of the pyramid

Enter # of lines to display: 4

1 x 8 + 1 = 9

12 x 8 + 2 = 98

123 x 8 + 3 = 987

1234 x 8 + 4 = 9876

There are 20 spaces in front of the last line of the pyramid