### SIENA COLLEGE

**24th Annual**

### High School Programming Contest

##### April 8, 2011

###### **Problem #2: Is it a date?**

Background Information: *Thirty days hath September, April, June, and November; all the rest have thirty-one, save February alone, which hath 28 in fine, except when leap year gives it twenty-nine.*

The Catholic Church in Rome tied its celebration of Easter to the vernal equinox. The Julian Calendar which began in 45 BC and marked March 21 as the day of the vernal equinox was about 10 tens off of this astronomical event by 1582 AD, when Pope Gregory XIII decreed the use of a new calendar, now referred to as the Gregorian Calendar. The new calendar would more accurately make adjustments for the length of a year which is about 365.2425 days and not the 365.25 days considered by the Julian Calendar.

The Gregorian Calendar, which is the most commonly used calendar in the world today, counts a year as a leap year if it is divisible by four unless it is divisible by 100 and then it is not a leap year, unless it is divisible by 400 and then it is. For example 1899 was not a leap year, 1900 was not a leap year, 1904 was a leap year, 1996 was a leap year, and 2000 was a leap year.

Note that legal dates in the Gregorian calendar start in the year 1582.

###### Programming Problem:

Input: Three positive integers M, D, Y. The variable M represents a month (1 for January, 2 for February, …), D a day, and Y a year.

Output: The three input values followed by LEGAL if the date is a date in the

Gregorian Calendar based on the rules described above and the year is greater than 1581.

otherwise the output should be the input values followed ILLEGAL.

###### Example 1: Input: 4 8 2011 Example 5: Input: 5 29 1520

###### Output: 4 8 2011 LEGAL Output: 5 29 1520 ILLEGAL

###### Example 2: Input: 2 29 1900 Example 6: Input: 9 39 2012

###### Output: 2 29 1900 ILLEGAL Output: 9 39 2012 ILLEGAL

Example 3: Input: 2 29 2000 Example 7: Input: 25 25 1948

Output: 2 29 2000 LEGAL Output: 25 25 1948 ILLEGAL

Example 4: Input: 2 29 2100 Example 8: Input: 12 12 3500

Output: 2 29 2100 ILLEGAL Output: 12 12 3500 LEGAL