### SIENA COLLEGE

**22nd Annual**

### High School Programming Contest

##### April 3, 2009

###### **Problem #2: Calendar Days**

Background Information: In the 2009 calendar year, we have 365 days spread over 12 months, from January 1st 2009, through December 31st 2009. Your job is to convert from a cardinal number representation of a date (1-01-2009) to a proper ordinal number representation. The rules for the proper suffixes for days are as follows:

* + If a number ends in 1,
    - If that number is a 1, 21, or 31, append a “st” to it.
    - If that number is an 11, append a “th” to it.
  + If a number ends in 2
    - If that number is a 2 or a 22, append an “nd” to it.
    - If that number is a 12, append a “th” to it.
  + If a number ends in 4, 5, 6, 7, 8, 9, or 0, append a “th” to it.
  + If a number ends in 3,
    - If that number is a 3 or 23, append a “rd” to it.
    - If that number is a 13, append a “th” to it.

###### Programming Problem:

Input: Two positive integers representing valid month/day combinations for the

year 2009. The month is first, followed by the date.

Output: The date, starting with the month, followed by the day as an ordinal

number, followed by the year 2009. All values are separated by one space.

###### Example 1: Input: 1 2

###### Output: January 1st 2009

###### Example 2: Input: 10 8

###### Output: October 8th 2009

Example 3: Input: 4 7

Output: April 7th 2009

Example 4: Input: 12 12

Output: December 12th 2009

**Zeller’s congruence**

**Zeller's congruence** is an [algorithm](http://en.wikipedia.org/wiki/Algorithm) devised by [Christian Zeller](http://en.wikipedia.org/wiki/Christian_Zeller) to calculate the day of the week for any [Julian](http://en.wikipedia.org/wiki/Julian_calendar) or [Gregorian calendar](http://en.wikipedia.org/wiki/Gregorian_calendar) date.

For the Gregorian calendar, Zeller's congruence is

h = \left(q + \left\lfloor\frac{(m+1)26}{10}\right\rfloor + K + \left\lfloor\frac{K}{4}\right\rfloor + \left\lfloor\frac{J}{4}\right\rfloor - 2J\right) \mod 7,

for the Julian calendar it is

h = \left(q + \left\lfloor\frac{(m+1) 26}{10}\right\rfloor + K + \left\lfloor\frac{K}{4}\right\rfloor + 5 - J\right) \mod 7,

where

* *h* is the day of the week (0 = Saturday, 1 = Sunday, 2 = Monday, ...
* *q* is the day of the month
* *m* is the month (3 = March, 4 = April, 5 = May, ...)
* *K* the year of the century (year \mod 100).
* *J* is the century (actually \lfloor year/100 \rfloor) (For example, in 1995 the century would be 19, even though it was the 20th century.)

NOTE: In this algorithm, January and February are counted as months 13 and 14 of the previous year.

"Zeller's congruence." *Wikipedia, The Free Encyclopedia*. 5 Jan 2009, 08:24 UTC. 30 Mar 2009 <<http://en.wikipedia.org/w/index.php?title=Zeller%27s_congruence&oldid=262059235>>.