# 22nd Palindrome Day is November 22nd! <br> (By Aziz S. Inan, Ph.D., Electrical Engineering, University of Portland, in Portland, Oregon) 

(11-22-11)
The date number of Tuesday, November 22nd, 2011 when expressed as 11-22-11 (or simply, 112211) happens to be the 22nd and last palindrome day of its kind to occur in 2011! Why?

Table I lists all the 22 palindrome days for this year where each palindrome date number is expressed using only the rightmost two digits of 2011 (i.e., 11):

Table I-Palindrome days in 2011 expressed in terms of two-digit year numbers.

| Calendar Day in 2011 | Its Palindrome <br> Date Number | Calendar Day in 2011 | Its Palindrome <br> Date Number |
| :--- | :---: | :--- | :---: |
| \#1-January 1, 2011 | $1-1-11$ | \#12-November 1, 2011 | $11-1-11$ |
| \#2-January 10, 2011* | $1-10-11$ | \#13-November 2, 2011* | $11-2-11$ |
| \#3-January 11, 2011 | $1-11-11$ | \#14-November 3, 2011 | $11-3-11$ |
| \#4-January 12, 2011 | $1-12-11$ | \#15-November 2, 2011 | $11-4-11$ |
| \#5-January 13, 2011 | $1-13-11$ | \#16-November 5, 2011 | $11-5-11$ |
| \#6-January 14, 2011 | $1-14-11$ | \#17-November 6, 2011 | $11-6-11$ |
| \#7-January 15, 2011 | $1-15-11$ | \#18-November 7, 2011 | $11-7-11$ |
| \#8-January 16, 2011 | $1-16-11$ | \#19-November 8, 2011 | $11-8-11$ |
| \#9-January 17, 2011 | $1-17-11$ | \#20-November 9, 2011 | $11-9-11$ |
| \#10-January 18, 2011 | $1-18-11$ | \#21-November 11, 2011 | $11-11-11$ |
| \#11-January 19, 2011 | 1-19-11 | \#22-November 22, 2011 | $11-22-11$ |

*These are also palindrome days when expressed as 1-10-2011 (January 10, 2011) and 11-022011 (November 2, 2011).

As seen in this table, November 22nd (11-22-11) is indeed the last palindrome day in 2011 and the 22nd palindrome day of its kind!

112211 have other unique numerical properties:

- 112211 equals to $101 \times 11 \times 101$, a palindrome expression! (Note that 11 and 101 are the smallest two- and three-digit palindrome numbers. Also, these palindrome numbers are made of "binary digits".) Also, $112211=101 \times 1111$, the product of two palindrome numbers which are also made up of binary digits.
- 112211 is the second and last palindrome day of its kind to occur in the 21 st century involving month, day and year numbers, all three of which are made of two-digit palindromes (i.e., 11, 22 and 11). (Also, $11+11=22$.$) The other such day in this century is November 11, 2011$ (111111) which occurred 11 days before 112211. By the way, $11 \times 112211=1234321$, an extremely special perfect-square palindrome day to occur on January 23, 4321! (Also, interestingly enough, note that year 4321 is 2310 years away from 2011 where $2310=2 \times 3 \times 5 \times 7 \times 11$, that is, the product of the first five prime numbers!)
- Note that November 22 nd will be a unique palindrome day in the 23 rd century because November 22, 2211 will again correspond to 112211 but also the full date number of November 22,2211 expressed in terms of its complete year number will be 11222211, an eight-digit
palindrome day! Also, note that 11222211 can be expressed as the product of "binary-digit" palindrome numbers in three different ways:

$$
11222211=101 \times 111 \times 1001=111 \times 101101=101 \times 111111 \text { ! }
$$

- In most other countries where the calendar date is expressed as day-month-year, November 22 nd will again be a palindrome day 11 years later in 2022, expressed as 221122 !
- Also, November 22nd is the 326th day of a non-leap year (e.g., 2011) where the digits of 326 add-up to 11 , the last two-digits of 2011!

In summary, November 22nd, 2011 expressed as 112211 is another special palindrome calendar day to celebrate because, it's the last (22nd) palindrome day of 2011, it owns other unique numerical properties as summarized above, and for most of us, this palindrome day won't repeat again in our lifetime.


