

Date Calculation Overview

Programmers use the term "Julian Date" to mean any serial date integer from any arbitrary beginning, but usually from the beginning of a particular year. The Excel date code uses 1/1/1900 as the starting date.

When calculating the number of years between two dates in Excel, it is typical for one to compute the difference in days between the dates and divide the result by 365.25. However, the actual mean time for one year is around 365.2422 days. So the question is how can our calendar stay in sync with the seasons when one year is just slightly more than 365 days long?

The Julian calendar became official in 46 B.C. It replaced calendars using a uniform 365 days per year, which resulted in an error of almost six hours per year. The Julian calendar corrected most of the problem because it provides for a leap year with an extra day every four years, or an average of 365.25 days per year. This still creates an error of eleven minutes per year. So by 1582 A.D., the Julian calendar had become out of step with the seasons by ten days.

In October 1582, Pope Gregory XIII ordered that ten days be subtracted from the calendar and came up with the calculation that is used today which does not include a leap day in a year divisible by 100 but not divisible by 400. The year 2000 was the first time the third rule, that every fourth century (1600, 2000, 2400) divisible by 100 is a leap year.

The modern leap year calculation was placed into law by an act of the British Parliament in the Calendar Act of 1751. By then, another eleven days had to be dropped, so the day after September 2, 1752 was September 14, 1752.

Because of these adjustments made over the years, if you ever need to calculate dates far into the past, these fundamental shifts have to be taken into consideration.

In Excel, the DATEDIF function can be used to accurately calculate the number of days, month, and years between two dates. This is a hidden function with the following syntax:

```
=DATEDIF(start_date,end_date,"code")
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- The start date must be less than the end date and not less than 1/1/1900. If a date less than this is entered, the function will assume 1/1/1900 as the start date
- The end date could be today's date using the now() function.
- The code must be in quotes:
 - "y"=years
 - "m"=months
 - "d"=days