

What's the Day of the Week?

Liverpool Maths Club

January 2021

The Year: We start with 2000 having a year code of 0. Each year that follows increases the year code by 1, unless it is a leap year, in which case it increases the year code by 2. For example:

Year	2001	2002	2003	2004	2005	2006	2007	2008
Code	1	2	3	5	6	0	1	3

(Remember, if we go above 7, we need to subtract 7 to end up with a number between 0 and 6.)

Some other years further in the past have the following codes:

Year	1800	1900	1940	1950	1960	1970	1980	1990
Code	3	1	2	0	6	4	3	1

The Month: The months all receive the following encodings. Note that if the year of the date you are interested in is a leap year, you need to use the number in brackets if the date is in January or February.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	6 (5)	2 (1)	2	5	0	3	5	1	4	6	2	4

The Day: The day of the month is the easiest ingredient! Simply find the remainder when the number is divided by 7.

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Finding the Day of the Week: Add up the year code, the month code and the number for the day, and compute the remainder for the number when it is divided by 7. The numbers correspond to the days of the week as follows:

Final Number	1	2	3	4	5	6	0
Day of the Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

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Example: 30 January 2021:

- **Year:** 2021 has year code **5**. (21 years since 2000, plus 5 leap years. $21 + 5 = 26$, which has remainder 5 when divided by 7.)
- **Month:** January has month code **6**. 2021 is not a leap year so no need to use the bracketed number.
- **Day:** 30 divided by 7 leaves remainder **2**.

$5 + 6 + 2 = 13$, which leaves remainder **6** when divided by 7. This (unsurprisingly) corresponds to a Saturday.

Questions:

- 1 What is the year code for the year you were born? Verify that the above method works by computing the day of the week for your date of birth, or the date of birth of someone you know.
- 2 General elections in the UK are normally held on Thursdays. The last one that was not occurred on 27 October 1931. What day of the week was this?
- 3 The next solar eclipse visible from Britain will occur on 23 September 2090. What day of the week will that be?
- 4 What is the maximum number of Friday the 13ths a calendar year can have? Which was the last year to have this many? Which will be the next year to have this many?