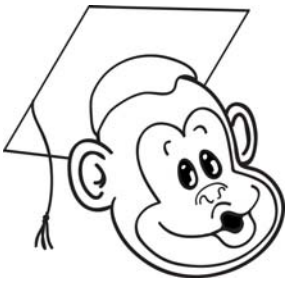
This brainteaser was written by Derrick Niederman.

Tom was born on Thanksgiving Day. On his seventh birthday, he noticed that Thanksgiving had never fallen on his birthday. How old will he be when he finally has a Thanksgiving birthday?

November						
Su	M	T	W	Th	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26		28	29
30						



Solution: 11.

Start by considering a specific example. Let's say that Thanksgiving falls on November 26 in a given year. If the next year is a non-leap year, Thanksgiving will fall on November 25. If the next year is a leap year, Thanksgiving will fall on November 24. Said another way, if November 26 is a Thursday in a given year, then November 26 will be Friday the following year (if it's a non-leap year) or Saturday (if it's a leap year).

There are three things you need to know:

- Thanksgiving is always on a Thursday (the fourth Thursday in November, in fact).
- In a nonleap year, the calendar shifts by one day from one year to the next, because there are seven days in a week, and 365 has a remainder of 1 when divided by 7.
- In a leap year, there is a two-day shift, because 366 has a remainder of 2 when divided by 7.

Suppose that Tom were born on Thanksgiving Day in the year 2000. His first Thanksgiving birthday would be his sixth birthday, because by 2006 the calendar would have shifted one day per year plus a second day during the leap year of 2004, for a total shift of seven days, which is exactly a week.

We don't know the year in which Tom was born, but we don't have to. If he was born in a leap year, he'd have a Thanksgiving birthday at age 6, and that apparently didn't happen. If he was born the year after a leap year, as in 2001, he'd also have a Thanksgiving birthday at age 6, for the same reasons as above. If he was born the year before a leap year, as in 2003, he'd have a Thanksgiving birthday at age 5, because by then the calendar would have shifted 7 days—one for each of his five birthdays and two for the leap years at age 1 (in 2004) and 5 (in 2008).

Therefore, Tom must have been born midway through the leap year cycle. The days of his birthdays look like this:

AGE	DAY OF BIRTHDAY
1	Friday
2	Sunday (leap-year double-skip)
3	Monday
4	Tuesday
5	Wednesday
6	Friday (another leap-year double-skip)
7	Saturday
8	Sunday
9	Monday
10	Wednesday (one more leap-year double-skip)
11	**Thursday**

In general, Tom will celebrate a Thanksgiving birthday according to an 11-6-5-6 pattern, meaning his eleventh, seventeeth, twenty-second and twenty-eighth birthdays will fall on Thanksgiving, at which point the cycle starts over again.