

## HISTORICAL FINANCIAL STATISTICS: CALENDAR NOTES

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### Contents

This file accompanies a calendar spreadsheet at <http://www.centerforfinancialstability.org/hfs/Calendars.xlsb>. Only versions of Excel starting with Excel 2007 can read the spreadsheet. The more than 200,000 rows of the spreadsheet exceed what earlier versions of Excel can handle.

1. Overview.
2. Days of the week: The standard seven-day week.
3. Julian day number: An identifier used by astronomers and computer programmers.
4. Julian calendar: The calendar of the Roman Empire and later the standard Christian calendar until the Gregorian calendar started to replace it in 1582. Not used by any country for civil purposes since 1923, although still used as a religious calendar by some Orthodox Christian churches. The spreadsheet shows two versions of the Julian calendar, one listing months by name in a day/month/year format, and the other using only numbers in a year/month/day format whose components are separated by periods. Deleting the periods makes the dates purely a string of numbers, which may help in sorting dates.
5. Gregorian calendar: The most widely used calendar in the world today. The spreadsheet shows two versions of the Gregorian calendar, one listing months by name in a day/month/year format, and the other using only numbers in a year.month.day format.
6. Buddhist calendar: Not listed in the spreadsheet, but discussed here.
7. Chinese calendar: Used in China to 1911. Had counterparts in other East Asian countries. Still used today as a cultural calendar.
8. Ethiopian calendar: Used in Ethiopia.
9. French Republican (Revolutionary) calendar: Used in France from 1792 to 1805.
10. Hebrew calendar: Used in Israel.
11. Iranian (jalali) calendar: Used in Iran and Afghanistan.
12. Islamic (hijri) calendar: Used in many majority Moslem countries as the civil calendar or as a parallel civil calendar alongside the Gregorian calendar.
13. Rumi calendar: Used in the Ottoman Empire and later Turkey from 1840 to 1926.
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## 1. Overview

To facilitate comparison of dates, an accompanying spreadsheet shows dates according to various calendars. Because the spreadsheet is so long, it is in Excel binary format, which users with older versions of Excel may be unable to read.

Monthly or less frequent data in Historical Financial Statistics typically conform to the local calendar used at the time if it was the basis for reporting the data. Hence month-end data for the Greek central bank's assets and liabilities in 1900 are for the end of the month according to the Julian calendar, which Greece used at the time, rather than according to the Gregorian calendar. Similarly, month-end data for Iran are for the end of the month according to the Iranian calendar. Spreadsheets of monthly data in Historical Financial Statistics list months as, for instance, "1900M1" rather than "January 1900" as a subtle reminder that monthly data may not all be from the same day of the month by the Gregorian calendar. Where data are sparse, such as for many exchange rates before the 1800s, monthly data often come from varying times of the month. The competing use of the Julian and Gregorian calendars from 1582-1923 means that a point of data that falls in a particular month according to the Julian calendar falls in the later part of the same month or the early part of the next month in the Gregorian calendar.

## 2. Days of the week

The seven days of the week are, in English, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, and Sunday. All the calendars listed here except the Julian day number and, for awhile, the French Republican calendar, have used seven-day weeks. The day considered to be the first day of the week varies under different calendars and according to the practice of different religions. The usual day of weekly religious observances is Friday for Moslems, Saturday for Jews, and Sunday for Christians. Days in the Hebrew and Islamic calendars last from sunset to sunset rather than from midnight to midnight, so, for example, the Jewish Sabbath is Friday evening to Saturday afternoon. When listing dates according to different calendars, the standard practice is to equate a day in a sunset-to-sunset calendar to the day beginning at the next midnight in a midnight-to-midnight calendar, so that their daylight hours overlap.

## 3. Julian day number

*Where and when used:* Used worldwide by astronomers since the late 1800s, and more recently by computer programmers.

*Type of calendar:* Numbered days. Neither solar, nor lunar, nor lunisolar.

*Demarcation of a day:* Noon to noon. Julian day numbers they were devised for the convenience of astronomers, who make their observations of the sky at night. In the spreadsheet, a Julian day number is for the Julian day that begins at noon of the corresponding dates in other calendars.

*Months and days:* The Julian day number does not use months, only numbered days.

*Leap year rules:* None; the Julian day number does not use years, only numbered days.

*Begins (first day, first month, first year):* Noon on Day 1, corresponding to 1 January 4713 B.C. (Julian) or 24 November 4713 B.C. (Gregorian). This is the first day of the world according to the Bible, as calculated by the French scholar Joseph Justus Scalinger in 1583.

*Other remarks:* Julian day numbers were the idea of the astronomer John Herschel (1792-1861), one of the best-known English scientists of his time.

#### **4. Julian calendar**

*Where and when used:* Used in the Roman Empire from 45 B.C. and then throughout Europe and its colonies. The Gregorian calendar gradually replaced the Julian calendar starting on 4 October 1582 (Julian), as more and more countries adopted the Gregorian calendar. Greece, the last country to use the Julian calendar for civil purposes, switched to the Gregorian calendar on 1 March 1923 (Gregorian). Some Orthodox Christian churches continue to use the Julian calendar for religious purposes. Because it continues to influence patterns of production and trade in predominantly Orthodox countries, the spreadsheet shows it into the near future.

*Type of calendar:* Solar.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months of 28-31 days each, making 365 days in a regular year (366 days in a leap year). January, 31 days; February, 28 days (29 days in a leap year); March, 31 days; April, 30 days; May, 31 days; June, 30 days; July, 31 days; August, 31 days; September, 30 days; October, 31 days; November, 30 days; December, 31 days.

*Leap year rules:* Leap year occurs in every year divisible by 4.

*Begins (first day, first month, first year):* 1 January 1, corresponding to Julian day number 1721424. Dated according to an old estimate of the birth of Jesus Christ, so B.C. means “before Christ” and A.D. means *anno Domini*, Latin for “in the year of our Lord.”

*Other remarks:* The Julian calendar is named after Julius Caesar, who devised it. In ancient Rome, and in Europe for many centuries thereafter, it was customary to refer to days of the month by counting from key days. The *kalends* was the first day of the month. The *ides* was in the middle of the month, being the 15<sup>th</sup> day of March, May, July, and October, and the 13<sup>th</sup> day of all other months. The *nones* was 8 days before the *ides*.

#### **5. Gregorian calendar**

*Where and when used:* Currently the standard calendar in use around the world. Began to replace the Julian calendar on 4 October 1582 (Julian), corresponding to 15 October 1582 (Gregorian).

*Type of calendar:* Solar.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months of 28-31 days each, making 365 days in a regular year (366 days in a leap year). January, 31 days; February, 28 days (29 days in a leap year); March, 31 days; April, 30 days; May, 31 days; June, 30 days; July, 31 days; August, 31 days; September, 30 days; October, 31 days; November, 30 days; December, 31 days.

*Leap year rules:* Leap year occurs in every year divisible by 4, except that years divisible by 100 are not leap years unless they are also divisible by 400.

*Begins (first day, first month, first year):* Because the Gregorian calendar was a revision to the Julian calendar, its starting date, like that of the Julian calendar, is 1 January 1. Working backwards from the present, one would get a different Julian day number for 1 January 1 with the Gregorian calendar than with the Julian calendar, but for dates before the Gregorian calendar

was introduced, anybody doing historical research uses Julian dates to list events in countries that used the Julian calendar.

*Other remarks:* The Gregorian is named after the Catholic pope, Gregory XIII, who promulgated it. It originated from a desire to keep calendar dates in closer synchronization with the seasons than the Julian calendar, which it replaced. When first implemented, the Gregorian calendar moved the date ahead 10 days so that the seasons would occur as they did in 325 A.D., when the Christian church's First Council of Nicaea had set the rules for determining the date of Easter. The Gregorian calendar also adopted a more complex rule for determining leap years, as described above. See below for a table listing when various countries switched from the Julian calendar to the Gregorian calendar.

## **6. Buddhist calendar (not listed in accompanying spreadsheet)**

*Where and when used:* Formerly used for centuries in Southeast Asia as a civil calendar. Still used today as a religious calendar.

*Type of calendar:* Lunisolar, indicating both the phase of the moon and the solar year.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months alternating between 29 and 30 days in a regular year, making 354 days in a regular year. A leap year has an extra day in one 29-day month and a 13<sup>th</sup> month of 30 days, making it 385 days. The Sanskrit names (with Burmese names in parentheses) of the months are Caitra (Tagu), 29 days; Vaisakha (Kason), 30 days; Jyestha (Nayon), 29 days (30 days in leap year); Ashadha (Waso), 30 days; Second Ashadha (Second Waso); 30 days (this month occurs in leap year only); Sravan (Wagaung), 29 days; Bhadrapada (Tawthalin), 30 days; Asvina (Thadingyut), 29 days; Karttika (Tarzaungmon), 30 days; Margasirsha (Natdaw), 29 days; Pausha (Pyatho), 30 days; Magha (Tabodwe), 29 days; Phalguna (Tabaung), 30 days.

*Begins (first day, first month, first year):* The Buddhist calendar begins with year 0 instead of year 1. Year 0 is 11 March 545 B.C. (Julian), the estimated date of the death of Buddha.

*Leap year rules:* Generally adds seven extra months every 19 years, and 11 extra days every 57 years, but this is only a rough guide to the results of the actual calculations.

*Other remarks:* The Thai/Lao/Cambodian version of the Buddhist calendar differs somewhat from the Burmese/Sri Lankan version. The Hindu version adds extra months and days (or removes months and days) as soon as the astronomical formulas require, whereas the Southeast Asian versions delay their addition. The Buddhist calendar is *not* listed in the accompanying spreadsheet.

## **7. Chinese calendar**

*Where and when used:* Used for millennia in China and other East Asian countries. China officially replaced the Chinese calendar with the Gregorian calendar for civil purposes on 1 January 1912, but the Chinese calendar continued to be widely used unofficially until the Communist conquest of the Chinese mainland in 1949. The Chinese calendar continues to be used as a cultural calendar, especially to mark the Chinese (lunar) new year. Because it continues to influence patterns of production and trade in East Asia, the spreadsheet shows it into the near future.

*Type of calendar:* Lunisolar, indicating both the phase of the moon and the solar year.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months of 29-30 days each, plus an intercalary month of 29-30 days when needed, making 353-355 days in a regular year (383-385 days in a leap year). The months are: 正月 Zhèngyuè (“principal month”); 二月 Èryuè (“second month”); 三月 Sānyuè (“third month”); 四月 Sìyuè (“fourth month”); 五月 Wǔyuè (“fifth month”); 六月 Liùyuè (“sixth month”); 七月 Qīyuè (“seventh month”); 八月 Bāyuè (“eighth month”); 九月 Jiǔyuè (“ninth month”); 十月 Shíyuè (“tenth month”); 十一月 Shíyīyuè (“eleventh month”); 十二月 Shí’èryuè (“twelfth month”); 閏月 Rùnyuè (movable intercalary month). Months start on the day closest to the new moon. Because the length of lunar months varies slightly, Chinese months usually alternate between 29 and 30 days, but strings of 29-day or 30-day months sometimes occur to keep the start of the month closest to the new moon.

A traditional system subdivided days into 12 hours. A second system subdivided days into 100 parts, called *ke*. Because 100 could not be divided evenly into 12, the system was changed to variously 96, 108, and 120 *ke* in a day. During the Ch’ing (Qīng) Dynasty, the day was officially subdivided into 96 *ke*, so each *ke* was equivalent to 15 minutes.

*Begins (first day, first month, first year):* The new year starts on the second new moon after the winter solstice. (The northern hemisphere winter solstice occurs on December 21 or 22 in the Gregorian calendar). Unlike other calendars here, which have a single starting date, in the Chinese calendar the reign of each new emperor began a new epoch considered year 1. The last emperor abdicated in 1912 (Gregorian) and was succeeded by the Republic of China. In Taiwan, 1912 is used as the starting date of the current epoch in some official communications.

*Leap year rules:* Leap years are those in which there are 13 new moons from the start of the 11<sup>th</sup> month of one year to the start of the 11<sup>th</sup> month of the next year. The position of the intercalary month in a leap year varies according to rules concerning the longitude of the sun, which interested readers can find described elsewhere.

*Other remarks:* In one form or another, the Chinese calendar is millennia old, but the rules that still apply to it today were first adopted under the Emperor Wu in 104 B.C. Within the framework of those rules, there were a number of later reforms to the calendar, the last one occurring under the Ch’ing Dynasty in 1645. **The spreadsheet does not show dates before 1644, the start of the Ch’ing Dynasty. If any reader has a spreadsheet of Chinese calendar dates before 1644 that he is willing to share, I would be grateful for the data. Dates should be actual dates, not backward-looking calculations using the rules of the post-1645 calendar.**

There is a 12-year cycle in which each year is associated with an animal (rat, ox, tiger, hare, dragon, snake, horse, sheep/goat/ram, monkey, rooster, dog, pig), and a 60-year cycle in which the 12-year cycles repeat five times, each animal year being associated with one of five elements (wood, fire, earth, water, metal; for instance, the first three years of the cycle are wood-rat, wood-ox, and fire-tiger).

## 8. Ethiopian calendar

*Where and when used:* Ethiopia, for many centuries.

*Type of calendar:* Solar.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months of 30 days each, plus 5 days (6 days in a leap year) at the end of the year, or 365 days in a regular year (366 days in a leap year). The months are Maskaram, 30 days; Teqemt, 30 days; Hedār, 30 days; Tākhsās, 30 days; Ter, 30 days; Yakātit,

30 days; Magābit, 30 days; Mizāyā, 30 days; Genbot, 30 days; Sanē, 30 days; Hamlē, 30 days; Nahasē, 30 days; Pāguaemēn, 5 days (6 days in leap year). Pāguaemēn is sometimes called a “short month.”

*Begins (first day, first month, first year):* 1 Maskaram 1, corresponding to Julian day number 1724221 and to 29 August 8 A.D. (Julian). Dated according to an estimate of the birth of Jesus Christ that differs from the date used for the Julian calendar.

*Leap year rules:* Leap year occurs every fourth year, namely, years of a century ending in 03, 07, 11, etc.

*Other remarks:* The Ethiopian descends from the Coptic calendar, which in turn is based on the ancient Egyptian solar calendar but has leap years. The Coptic and Ethiopian calendars have different names for months and days of the week, and the Coptic calendar begins 276 years later than the Ethiopian calendar, but otherwise they are the same.

## 9. French Republican (Revolutionary) calendar

*Where and when used:* France, 24 November 1793 (Gregorian)–31 December 1805 (Gregorian). France returned to the Gregorian calendar on 1 January 1806. During the Paris Commune uprising of 1871, the rebel government established by the Commune used the Republican calendar from 6–23 May 1871 (Gregorian), corresponding to 16 Floréal–3 Prairial LXXIX (Republican).

*Type of calendar:* Solar.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months of 30 days plus 5 additional days (6 additional days in a leap year), making 365 days in a regular year (366 days in a leap year). The months (with their connotations in parentheses) were Vendémiaire (vintage); Brumaire (fog); Frimaire (sleet); Nivôse (snow); Pluviôse (rain); Ventôse (wind); Germinal (seed); Floréal (blossom); Prairial (pasture); Messidor (harvest); Thermidor (heat); Fructidor (fruit). The additional days at the end of the year were the holidays Jour (or, for this and the rest, Fête) de la Vertu (Day, or Holiday, of Virtue); Jour du Génie (Genius or Intellect); Jour du Travail (Labor); Jour de l’Opinion (Opinion); Jour de la Récompense (Reward); and, in a leap year, Jour de la Révolution (Revolution).

The French experimented for a time with decimalizing months and days, dividing months into three “decades” (10-day periods) instead of seven-day weeks. Each day was divided into 10 hours, and each hour into 100 minutes. A day of rest occurred only one day per decade rather than one day per week, a feature that increased the unpopularity of the decimalization and hastened the return to the 24-hour day and the seven-day week.

*Leap year rules:* In practice, leap year occurred every fourth year. During the years the calendar was used, these were years III, VII, and XI. The calendar was not used long enough for more complex rules applying to long periods to come into use.

*Begins (first day, first month, first year):* 1 Vendémiaire Year I, corresponding to Julian day number 2375840 and to Saturday, 22 September 1792 (Gregorian). Dated according to the day of the autumnal equinox that year and the first day after the French Republic replaced the monarchy.

*Other remarks:* The French Republican calendar was established as part of the rationalizing spirit of the French Revolution, as its months of equal length and attempt at decimalizing months and days suggest. Although the first day of the calendar corresponded to 22

September 1792 (Gregorian), the first day the calendar actually began contemporaneous use was 15 Frimaire II, corresponding to 24 November 1793 (Gregorian).

## 10. Hebrew calendar

*Where and when used:* Used for millennia as the Jewish religious calendar. Used as a civil calendar in Israel since its independence on 14 May 1948.

*Type of calendar:* Lunisolar, indicating both the phase of the moon and the solar year.

*Demarcation of a day:* Sunset to sunset. The standard practice is to link a Hebrew date to the Julian or Gregorian date beginning at the next midnight. Doing so includes the daylight hours of both dates, during which most business is conducted.

*Months and days:* Twelve months (13 months in a leap year) of 29 or 30 days each, making 353-355 days (383-385 days in a leap year). The months are Nisan, 30 days; Iyyar, 29 days; Sivan, 30 days; Tammuz, 29 days; Av, 30 days; Elul, 29 days; Tishri, 30 days; Marḥeshvan, 29 or 30 days; Kislev, 29 or 30 days; Tevet, 29 days; Shevat, 30 days; Adar I, 30 days (this month occurs in a leap year only); Adar II (Adar Beit or Veadar), 29 days (this month is called simply Adar except in leap years). The Hebrew-to-English transliterations of the names differ across sources.

*Begins (first day, first month, first year):* 1 Tishri 1, corresponding to Julian day number 347998 and to 7 October 3761 B.C. (Julian). The calendar is dated according to an estimate of the beginning of the world.

*Leap year rules:* Leap years occur in 7 years of a 19-year cycle, namely years 3, 6, 8, 11, 14, 17, and 19.

*Other remarks:* The rules for determining the number of days in the months of Marheshvan and Kislev depends on the overall length of the year. Because of the complexity of its rules, the Hebrew calendar repeats only after 689,472 years.

## 11. Iranian (jalali) calendar

*Where and when used:* Iran, in the modern version of the calendar since 1925, and in Afghanistan since 1957.

*Type of calendar:* Solar.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months, the first 6 having 31 days, the next 5 having 30 days, and the last having 29 days (30 days in a leap year), making 365 days (366 days in a leap year). The Iranian names of the months (with Afghan names in parentheses) are Farvadīn (Hamal), 31 days; Ordībehešt (Sawour), 31 days; Xordād or Khordād (Jowza), 31 days; Tīr (Sarataan), 31 days; Mordād (Asad), 31 days; Shahrīvar (Saunbola), 31 days; Mehr (Meezan), 30 days; Ābān (Hagrab), 30 days; Āzar (Qows), 30 days; Dey (Jady), 30 days; Bahman (Dalwo), 30 days; Esfand (Hoot), 29 days (30 days in a leap year).

*Leap year rules:* Leap year occurs when needed to minimize the difference between the start of the year and the spring equinox in the northern hemisphere, rather than according to a mathematical rule. In practice the result is that after occurring once every four years for seven cycles, leap year occurs in the fifth year after the seventh cycle.

*Begins (first day, first month, first year):* 1 Farvadīn 1, corresponding to Julian day number 1948321 and to 19 March 622 (Julian). The day is the first day of spring in the northern

hemisphere. The year is that of Mohammed's *hegira* (meaning "emigration"; sometimes rendered "flight") from Mecca to Medina.

*Other remarks:* A predecessor solar calendar was adopted in 1079 A.D. because of dissatisfaction with the seasonal drift of the lunar Islamic calendar through the solar year over time. In the predecessor calendar, months could have varying lengths that differed from year to year. The current Iranian calendar uses the same names for months as the old calendar did, but the months are unvarying except for the last month in a leap year. A.P., sometimes used to distinguish Iranian dates, means *anno Persico* ("Persian year"). The spreadsheet does not show dates before 1925. If any reader has a spreadsheet of Iranian calendar dates before 1925 that he is willing to share, I would be grateful for the data. Dates should be actual dates, not backward-looking calculations using the rules of the post-1925 calendar.

On 21 March 1976, the start of a new Iranian year, the Iranian government changed the year from 1355 to 2535, starting the calculation of years from the birth of the ancient Persian emperor Cyrus rather than from Mohammed's *hegira*. The months and days remained as before. The change was unpopular because Iranians viewed it as a symbolic attempt by Shah Reza Mohammed Pahlavi to elevate the monarchy over Islam. The new calendar year was widely ignored, and is not listed in the spreadsheet. On 27 August 1978 (Gregorian; 5 Shahrivar 1357 Iranian), the government readopted the *hegira* as the beginning year of the calendar. The change occurred during the ferment of the Iranian Revolution, which led to the shah losing power in January 1979.

## 12. Islamic (hijri) calendar (arithmetically calculated)

*Where and when used:* Used in Islamic countries from 639 A.D. or earlier to the present.

*Type of calendar:* Lunar.

*Demarcation of a day:* Sunset to sunset. The standard practice is to link an Islamic calendar date to the Julian or Gregorian date beginning at the next midnight. Doing so includes the daylight hours of both dates, during which most business is conducted.

*Months and days:* Twelve months alternating between 30 and 29 days each, making 354 days in a regular year (355 days in a leap year). Muḥarram, 30 days; Şafar, 29 days; Rabī al-Awwal (Rabī I), 30 days; Rabī al-Thānī (Rabī al-Āḥir or Rabī II), 29 days; Jumādā al-Ūlā (Jumādā I), 30 days; Jumādā al-Thānī (Jumādā al- Āḥira or Jumādā II), 29 days; Rajab, 30 days; Shabān, 29 days; Ramaḍān, 30 days; Shawwāl, 29 days; Dhū al-Qada, 30 days; Dhū al-Ḥijja, 29 days (30 days in leap year). The Arabic-to-English transliterations of the names of months differ across sources because no uniform system of transliteration exists.

*Leap year rules:* Leap year occurs in 11 years of a 30-year cycle, namely, years 2, 5, 7, 10, 13, 16, 18, 21, 24, 26, and 29. Some Moslems count year 15 instead of year 16 as a leap year.

*Begins (first day, first month, first year):* 1 Muharram 1, corresponding to Julian day number 1948440 and to Friday, 16 July 622 (Julian — technically, sunset the previous day; see below). Dated according to an estimate of Mohammed's *hegira* (meaning "emigration"; sometimes rendered "flight") from Mecca to Medina. A.H., often used to distinguish Islamic dates, means *anno hegirae*, "in the year of [Mohammed's] hegira [that is, emigration]."

*Other:* The dates in the spreadsheet are calculated arithmetically. Until recently, Islamic calendar months were considered not to have begun until an actual sighting of the new moon. Because of weather conditions, the starting dates of months could differ from place to place by a day or two from the calculated dates.

### **13. Rumi calendar**

*Where and when used:* Ottoman Empire and its successor, the Republic of Turkey, from 13 March 1840 (Gregorian) to, apparently, 31 December 1925 (Gregorian).

*Type of calendar:* Solar.

*Demarcation of a day:* Midnight to midnight.

*Months and days:* Twelve months of 28-31 days each, making 365 days (366 days in a leap year). The only differences with the Julian and Gregorian calendars were the names of some months and the month the year began. The months were Kânûn-ı Sâni (corresponding to January), 31 days; Şubat, 28 days (29 days in leap year); Mart, 31 days; Nisan, 30 days; Mayıs, 31 days; Haziran, 30 days; Temmuz, 31 days; Ağustos, 31 days; Eylül, 30 days; Teşrin-i Evvel, 31 days; Teşrin-i Sâni, 30 days; Kânûn-ı Evvel, 31 days.

*Leap year rules:* Same as the Julian calendar until 1917, then the same as the Gregorian calendar.

*Begins (first day, first month, first year):* Year 1 of the calendar corresponds to 622 A.D., the year of Mohammed's emigration from Mecca to Medina. The Rumi calendar counts the years before it was adopted as in the Islamic calendar. The Islamic calendar is a lunar calendar whose years are shorter than Julian and Gregorian years. From the date of its adoption onward, the Rumi calendar, being a solar calendar, has years the same length as the Julian or Gregorian calendar. The Rumi calendar began to be used on 1 Mart 1256 (Rumi), corresponding to 1 March 1840 (Julian) or 13 March 1840 (Gregorian). March was the start of the Ottoman fiscal year. Originally the calendar was Julian-based, so that the start of the Rumi year was the same as the start of the Julian year, but in 1917 the Rumi calendar became Gregorian-based. To make the switch, 15 Şubat 1332 (Rumi), corresponding to 15 February 1917 (Julian), was succeeded by 1 Mart 1332 (Rumi), corresponding to 1 March 1917 (Gregorian). Hence 1332 is a short year in the Rumi calendar, having only 352 days.

*Other remarks:* Rumi is Turkish for "Roman." The Islamic calendar continued to be widely used alongside the Rumi calendar. The Rumi calendar was adopted for greater convenience in fiscal and civil matters. Since 1677 A.D. the Ottoman state had used the Julian calendar for fiscal matters. Turkey replaced the Rumi calendar with the Gregorian calendar in 1926, apparently at the start of the year.

### **14. The start of the new year in the Julian and Gregorian calendars**

The Gregorian new year starts on 1 January. In ancient Rome, where the Julian calendar originated, the new year started on 1 March, which explains why September, October, and November — Latin for the seventh, eighth, and ninth months, respectively — are named as they are. By the Middle Ages, the new year in Europe started on varying dates. In England, for instance, the legal year started on 25 March (the Feast of the Annunciation) until 1752, although by custom, many Englishmen had long since considered the year to start on 1 January.

In the spreadsheet, column B has asterisks from 25 December-24 March (Julian) from 1500-1751 to indicate the range of dates during which most countries using the Julian or Gregorian calendars began their new years.

### **15. Dates of important switches to the Gregorian calendar**

Countries switched from the Julian calendar (also called the Old Style calendar) to the Gregorian calendar (also called the New Style calendar) on the dates in the table below. Greece was the last country to make the switch, in 1923. Spreadsheets of daily data in Historical Financial Statistics that show Julian dates cease doing so after Greece's switch.

<b>Country</b>	<b>Last Julian day</b>	<b>First Gregorian day</b>	<b>New year January 1</b>
Italy (most parts)	Thursday, 4 October 1582	Friday, 15 October 1582	before 1582
Poland-a	Thursday, 4 October 1582	Friday, 15 October 1582	1583
Portugal/colonies	Thursday, 4 October 1582	Friday, 15 October 1582	1556
Spain/colonies	Thursday, 4 October 1582	Friday, 15 October 1582	1556
France/colonies —Alsace —Lorraine —Strasbourg	Sunday, 9 December 1582 5 February 1682 16 February 1760 February 1682	Monday, 20 December 1582 16 February 1682 28 February 1760 February 1682	1564
Luxembourg	Friday, 14 December 1582	Saturday, 25 December 1582	
Belgium-b	Friday, 21 December 1582	Saturday, 1 January 1583	1576
Holland-c	Tuesday, 1 January 1583	Wednesday, 12 January 1583	1583
Austria: Brixen, Salzburg, Tyrol Carinthia, Styria	Saturday, 5 October 1583 Saturday, 14 December 1583	Sunday, 16 October 1583 Sunday, 25 December 1583	
Bohemia/Moravia	Monday, 6 January 1584	Tuesday, 17 January 1584	
Germany:-d Catholic Protestant	1583 and 1584 Sunday, 18 February 1700	1583 and 1584 Monday, 1 March 1700	
Switzerland: Catholic Protestant	1583, 1584, 1597 Tuesday, 31 December 1700	1583, 1584, 1597 Wednesday, 12 January 1701	
Hungary: In practice By law	Wednesday, 22 January 1584 Saturday, 21 October 1587	Thursday, 2 February 1584 Sunday, 1 November 1587	
Transylvania	Monday, 14 December 1590	Tuesday, 25 December 1590	
Prussia	Wednesday, 22 August 1610	Thursday, 2 September 1610	
Denmark/Norway	Sunday, 18 February 1700	Monday, 1 March 1700	Gradual
Iceland	Saturday, 16 November 1700	Sunday, 28 November 1700	
United Kingdom/ colonies-f	Wednesday, 2 September 1752	Thursday, 14 September 1752	1752-g
Sweden/Finland	Wednesday, 17 February 1753	Thursday, 1 March 1753-e	1559
Albania	December 1912	December 1912	
Lithuania	1915	1915	
Latvia	Sometime 1915-1918	Sometime 1915-1918	
Bulgaria	Thursday, 31 March 1916	Friday, 14 April 1916	
Estonia	Wednesday, 31 January 1918	Thursday, 14 February 1918	
Russia-h	Wednesday, 31 January 1918	Thursday, 14 February 1918	1700
Serbia	Friday, 18 January 1919	Saturday, 1 February 1919	
Romania	Sunday, 31 March 1919	Monday, 14 April 1919	
Greece	Wednesday, 15 February 1923	Thursday, 1 March 1923	

*Notes:*

- a-Then in confederation with Lithuania. Reverted to the Julian calendar when Russian occupation began in 1795.
- b-Then called the Austrian Netherlands.
- c-Province of Holland, not the whole Netherlands. Dates for other provinces of what are now the Netherlands were as follows: Zeeland, Brabant, and the Staten Generaal: 14 December 1582 was followed by 25 December 1582. Limburg: 21 December 1582 was followed by 1 January 1583, as with the provinces that today are Belgium. Groningen: 10 February 1583 was followed by 21 February 1583, but the province reverted to the Julian calendar in mid 1594 before adopting the Gregorian calendar permanently when 31 December 1700 was followed by 12 January 1701. Gelderland: 30 June 1700 was followed by 12 July 1700. Utrecht and Overijssel: 30 November 1700 was followed by 12 December 1700. Friesland: 31 December 1700 was followed by 12 January 1701. Drenthe: 30 April 1701 was followed by 12 May 1701.
- d-Except Prussia; many local variations.
- e-Sweden's calendar has a curious history in the early 1700s, on which see other sources. Finland later became part of Russia, but continued to use the Gregorian calendar although Russia used the Julian calendar.
- f- Mainland Nova Scotia used the Gregorian calendar from 1605-13 October 1710 under French rule, although there were periods of English occupation when the Julian calendar may have been used. When English conquest became permanent, Nova Scotia following English practice, using the Julian calendar from 2 October 1710-2 September 1752 (Julian dates) and permanently adopting the Gregorian calendar on 14 September 1752 (Gregorian).
- g-1600 in Scotland.
- h-In the part of Russia ruled by the Bolshevik government. In parts of Russia then ruled by anti-Bolshevik forces, the change may not have occurred until later.

Except as noted, dates above for European countries also apply to their colonies. So, in what is now the United States, the parts under French and Spanish rule adopted the Gregorian calendar in 1582; the parts under British rule did so in 1752; and Alaska did so when the United States purchased it from Russia in 1867.

There were also countries that adopted the Gregorian calendar without ever having officially used the Julian calendar. Here is a list of some of them. For some purposes, such as determining traditional holidays, the previous calendar remains in parallel use.

<b>Country</b>	<b>Previous calendar</b>	<b>Adopted Gregorian calendar</b>
Japan	Japanese	1 January 1873
Egypt	Egyptian	11 September 1875 (1 Thaut 1592 in old calendar)
Thailand	Buddhist	1888-a
Korea	Korean	1 January 1896
China	Chinese	by law 1 January 1912; fully adopted in practice 1949
Turkey	Ottoman (Rumi)	1 January 1926

*Notes:*

- a-More precisely, Thailand adopted a solar calendar with a year equal to the Gregorian year. The calendar was dated from the Buddhist year zero, 545 B.C. (Julian or Gregorian), rather than from

1 A.D. The Thai solar new year originally began on 11 March, the date of Buddha's death, but in 1912 (Gregorian) it was changed to 1 April and in 1941 (Gregorian) to 1 January. The Thai year 2465, corresponding to 11 March 1911-31 March 1912, was therefore 20 days longer than normal, while the Thai year 2483 had only nine months, corresponding to April-December 1940 (Gregorian).

## 16. References

- Dershowitz, Nachum, and Edward M. Reingold. 2008. *Calendrical Calculations*, 3<sup>rd</sup> edition. New York: Cambridge University Press. See also a related Web site, <http://www.calendarists.com>.
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- Tøndering, Claus. [2010]. "Frequently Asked Questions about Calendars," version 2.9. <http://www.tondering.dk/claus/cal/calendar29.pdf>, viewed 21 February 2010.
- Wikipedia. 2010. Various articles on calendars. <http://www.wikipedia.com>, viewed August 2010. (The usual caution applies: check Wikipedia against other sources, especially scholarly books or articles.)

## 17. Other resources

- Chinese Lunar Calendar Converter (lists first days of months). <http://www.chinapage.com/astronomy/lunarcalendar.html>, viewed 11 November 2010.
- Fourmilab Calendar Converter. <http://www.fourmilab.ch/documents/calendar/>, viewed 11 November 2010.
- Nengo Calc (Japanese calendar converter). [http://web.me.com/meyer.eva/www.yukikurete.de/nengo\\_calc.htm](http://web.me.com/meyer.eva/www.yukikurete.de/nengo_calc.htm), viewed 11 November 2010.