Title

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Date and time functions

Contents

`age(`$e_{d\,\mathrm{DOB}}$`,`e_d`[,`s_d`])`	the age in integer years on e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates
`age_frac(`$e_{d\,\mathrm{DOB}}$`,`e_d`[,`s_d`])`	the age in years, including the fractional part, on e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates
`birthday(`$e_{d\,\mathrm{DOB}}$`,`Y`[,`s_d`])`	the e_d date of the birthday in year Y for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates
`bofd("`cal`",`e_d`)`	the e_b business date corresponding to e_d
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`clock(`s_1`,`s_2`[,`Y`])`	the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to s_1 based on s_2 and Y
`clockdiff(`e_{tc1}`,`e_{tc2}`,`s_u`)`	the difference, rounded down to an integer, from e_{tc1} to e_{tc2} in s_u units of days, hours, minutes, seconds, or milliseconds
`Cmdyhms(`M`,`D`,`Y`,`h`,`m`,`s`)`	the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) corresponding to M, D, Y, h, m, s
`Cofc(`e_{tc}`)`	the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) of e_{tc} (ms. without leap seconds since 01jan1960 00:00:00.000)
`cofC(`e_{tC}`)`	the e_{tc} datetime (ms. without leap seconds since 01jan1960 00:00:00.000) of e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)
`Cofd(`e_d`)`	the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) of date e_d at time 00:00:00.000
`cofd(`e_d`)`	the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) of date e_d at time 00:00:00.000
`daily(`s_1`,`s_2`[,`Y`])`	a synonym for `date(`s_1`,`s_2`[,`Y`])`
`date(`s_1`,`s_2`[,`Y`])`	the e_d date (days since 01jan1960) corresponding to s_1 based on s_2 and Y
`datediff(`e_{d1}`,`e_{d2}`,`s_1`[,`s_2`])`	the difference, rounded down to an integer, from e_{d1} to e_{d2} in s_1 units of days, months, or years with s_2 the nonleap-year anniversary for e_{d1} on 29feb

`datediff_frac(`e_{d1}`,`e_{d2}`,`s_1`[ ,`s_2`])`
: the difference, including the fractional part, from e_{d1} to e_{d2} in s_1 units of days, months, or years with s_2 the nonleap-year anniversary for e_{d1} on 29feb

`day(`e_d`)`
: the numeric day of the month corresponding to e_d

`dhms(`e_d`,`h`,`m`,`s`)`
: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to e_d, h, m, and s

`dofb(`e_b`,"`cal`")`
: the e_d datetime corresponding to e_b

`dofC(`e_{tC}`)`
: the e_d date (days since 01jan1960) of datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)

`dofc(`e_{tc}`)`
: the e_d date (days since 01jan1960) of datetime e_{tc} (ms. since 01jan1960 00:00:00.000)

`dofh(`e_h`)`
: the e_d date (days since 01jan1960) of the start of half-year e_h

`dofm(`e_m`)`
: the e_d date (days since 01jan1960) of the start of month e_m

`dofq(`e_q`)`
: the e_d date (days since 01jan1960) of the start of quarter e_q

`dofw(`e_w`)`
: the e_d date (days since 01jan1960) of the start of week e_w

`dofy(`e_y`)`
: the e_d date (days since 01jan1960) of 01jan in year e_y

`dow(`e_d`)`
: the numeric day of the week corresponding to date e_d; 0 = Sunday, 1 = Monday, ..., 6 = Saturday

`doy(`e_d`)`
: the numeric day of the year corresponding to date e_d

`halfyear(`e_d`)`
: the numeric half of the year corresponding to date e_d

`halfyearly(`s_1`,`s_2`[,`Y`])`
: the e_h half-yearly date (half-years since 1960h1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`

`hh(`e_{tc}`)`
: the hour corresponding to datetime e_{tc} (ms. since 01jan1960 00:00:00.000)

`hhC(`e_{tC}`)`
: the hour corresponding to datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)

`hms(`h`,`m`,`s`)`
: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to h, m, s on 01jan1960

`hofd(`e_d`)`
: the e_h half-yearly date (half years since 1960h1) containing date e_d

`hours(`ms`)`
: ms/3,600,000

`isleapyear(`Y`)`
: `1` if Y is a leap year; otherwise, `0`

`mdy(`M`,`D`,`Y`)`
: the e_d date (days since 01jan1960) corresponding to M, D, Y

`mdyhms(`M`,`D`,`Y`,`h`,`m`,`s`)`
: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to M, D, Y, h, m, s

`minutes(`ms`)`
: ms/60,000

`mm(`e_{tc}`)`
: the minute corresponding to datetime e_{tc} (ms. since 01jan1960 00:00:00.000)

`mmC(`e_{tC}`)`
: the minute corresponding to datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)

`mofd(`e_d`)`
: the e_m monthly date (months since 1960m1) containing date e_d

`month(`e_d`)`
: the numeric month corresponding to date e_d

`monthly(`s_1`,`s_2`[ ,`Y`])`
: the e_m monthly date (months since 1960m1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`

`msofhours(`h`)`
: $h \times$ 3,600,000

`msofminutes(`m`)` $m \times 60{,}000$

`msofseconds(`s`)` $s \times 1{,}000$

`nextbirthday(`$e_{d\,\mathrm{DOB}}$`,`e_d`[ ,`s_d`])`
the e_d date of the first birthday after e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates

`nextleapyear(`Y`)` the first leap year after year Y

`previousbirthday(`$e_{d\,\mathrm{DOB}}$`,`e_d`[ ,`s_d`])`
the e_d date of the birthday immediately before e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates

`previousleapyear(`Y`)` the leap year immediately before year Y

`qofd(`e_d`)` the e_q quarterly date (quarters since 1960q1) containing date e_d

`quarter(`e_d`)` the numeric quarter of the year corresponding to date e_d

`quarterly(`s_1`,`s_2`[,`Y`])` the e_q quarterly date (quarters since 1960q1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`

`seconds(`ms`)` $ms/1{,}000$

`ss(`e_{tc}`)` the second corresponding to datetime e_{tc} (ms. since 01jan1960 00:00:00.000)

`ssC(`e_{tC}`)` the second corresponding to datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)

`tC(`l`)` convenience function to make typing dates and times in expressions easier

`tc(`l`)` convenience function to make typing dates and times in expressions easier

`td(`l`)` convenience function to make typing dates in expressions easier

`th(`l`)` convenience function to make typing half-yearly dates in expressions easier

`tm(`l`)` convenience function to make typing monthly dates in expressions easier

`tq(`l`)` convenience function to make typing quarterly dates in expressions easier

`tw(`l`)` convenience function to make typing weekly dates in expressions easier

`week(`e_d`)` the numeric week of the year corresponding to date e_d, the `%td` encoded date (days since 01jan1960)

`weekly(`s_1`,`s_2`[,`Y`])` the e_w weekly date (weeks since 1960w1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`

`wofd(`e_d`)` the e_w weekly date (weeks since 1960w1) containing date e_d

`year(`e_d`)` the numeric year corresponding to date e_d

`yearly(`s_1`,`s_2`[,`Y`])` the e_y yearly date (year) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`

`yh(`Y`,`H`)` the e_h half-yearly date (half-years since 1960h1) corresponding to year Y, half-year H

`ym(`Y`,`M`)` the e_m monthly date (months since 1960m1) corresponding to year Y, month M

`yofd(`e_d`)` the e_y yearly date (year) containing date e_d

`yq(`Y`,`Q`)` the e_q quarterly date (quarters since 1960q1) corresponding to year Y, quarter Q

`yw(`Y`,`W`)`	the e_w weekly date (weeks since 1960w1) corresponding to year Y, week W

Functions

Stata's date and time functions are described with examples in **[U] 25 Working with dates and times**, [D] **Datetime**, and [D] **Datetime durations**. What follows is a technical description. We use the following notation:

e_b	`%tb` business calendar date (days)
e_{tc}	`%tc` encoded datetime (ms. since 01jan1960 00:00:00.000)
e_{tC}	`%tC` encoded datetime (ms. with leap seconds since 01jan1960 00:00:00.000)
e_d	`%td` encoded date (days since 01jan1960)
e_w	`%tw` encoded weekly date (weeks since 1960w1)
e_m	`%tm` encoded monthly date (months since 1960m1)
e_q	`%tq` encoded quarterly date (quarters since 1960q1)
e_h	`%th` encoded half-yearly date (half-years since 1960h1)
e_y	`%ty` encoded yearly date (years)
M	month, 1–12
D	day of month, 1–31
Y	year, 0100–9999
h	hour, 0–23
m	minute, 0–59
s	second, 0–59 or 60 if leap seconds
ms	milliseconds
W	week number, 1–52
Q	quarter number, 1–4
H	half-year number, 1 or 2

The date and time functions, where integer arguments are required, allow noninteger values and use the `floor()` of the value.

A Stata date-and-time (`%t`) variable is recorded as the milliseconds, days, weeks, etc., depending upon the units from 01jan1960; negative values indicate dates and times before 01jan1960. Allowable dates and times are those between 01jan0100 and 31dec9999, inclusive, but all functions are based on the Gregorian calendar, and values do not correspond to historical dates before Friday, 15oct1582.

`age(`$e_{d\,\mathrm{DOB}}$`,`e_d`[ ,`s_d`])`

Description: the age in integer years on e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates

s_d specifies when someone born on 29feb becomes another year older in nonleap years. s_d = `"01mar"` (the default) means the birthday is taken to be 01mar. s_d = `"28feb"` means the birthday is taken to be 28feb. See *Methods and formulas*.

When $e_d < e_{d\,\mathrm{DOB}}$, the result is *missing*.

Domain $e_{d\,\mathrm{DOB}}$: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain e_d: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain s_d: strings `"28feb"`, `"feb28"`, `"01mar"`, `"1mar"`, `"mar01"`, and `"mar1"` (case insensitive)
Range: integers 0 to 9897 or *missing*

`age_frac(`$e_{d\,\mathrm{DOB}}$`,`e_d`[ ,`s_d`])`

Description: the age in years, including the fractional part, on e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates

s_d specifies when someone born on 29feb becomes another year older in nonleap years. s_d = `"01mar"` (the default) means the birthday is taken to be 01mar. s_d = `"28feb"` means the birthday is taken to be 28feb. See *Methods and formulas*.

When $e_d < e_{d\,\mathrm{DOB}}$, the result is *missing*.

Domain $e_{d\,\mathrm{DOB}}$: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain e_d: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain s_d: strings `"28feb"`, `"feb28"`, `"01mar"`, `"1mar"`, `"mar01"`, and `"mar1"` (case insensitive)
Range: reals 0 to 9897.997... or *missing*

`birthday(`$e_{d\,\mathrm{DOB}}$`,`Y`[ ,`s_d`])`

Description: the e_d date of the birthday in year Y for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates

s_d specifies when someone born on 29feb becomes another year older in nonleap years. s_d = `"01mar"` (the default) means the birthday is taken to be 01mar. s_d = `"28feb"` means the birthday is taken to be 28feb. See *Methods and formulas*.

Domain $e_{d\,\mathrm{DOB}}$: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Domain Y: integers 0100 to 9999 (but probably 1800 to 2100)
Domain s_d: strings `"28feb"`, `"feb28"`, `"01mar"`, `"1mar"`, `"mar01"`, and `"mar1"` (case insensitive)
Range: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549) or *missing*

`bofd("`cal`",`e_d`)`

Description: the e_b business date corresponding to e_d
Domain cal: business calendar names and formats
Domain e_d: `%td` as defined by business calendar named cal
Range: as defined by business calendar named cal

`Cdhms(`e_d`,`h`,`m`,`s`)`

Description: the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) corresponding to e_d, h, m, s
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Domain h: integers 0 to 23
Domain m: integers 0 to 59
Domain s: reals 0.000 to 60.999
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds) or *missing*

`Chms(`h`,`m`,`s`)`

Description: the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) corresponding to h, m, s on 01jan1960
Domain h: integers 0 to 23
Domain m: integers 0 to 59
Domain s: reals 0.000 to 60.999
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds) or *missing*

`Clock(`s_1`,`s_2`[,`Y`])`

Description: the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) corresponding to s_1 based on s_2 and Y

Function `Clock()` works the same as function `clock()` except that `Clock()` returns a leap second–adjusted `%tC` value rather than an unadjusted `%tc` value. Use `Clock()` only if original time values have been adjusted for leap seconds.

Domain s_1: strings
Domain s_2: strings
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds) or *missing*

`clock(`s_1`,`s_2`[,`Y`])`

Description: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to s_1 based on s_2 and Y

s_1 contains the date, time, or both, recorded as a string, in virtually any format. Months can be spelled out, abbreviated (to three characters), or indicated as numbers; years can include or exclude the century; blanks and punctuation are allowed.

s_2 is any permutation of `M`, `D`, [##]`Y`, `h`, `m`, and `s`, with their order defining the order that month, day, year, hour, minute, and second occur (and whether they occur) in s_1. ##, if specified, indicates the default century for two-digit years in s_1. For instance, s_2 = `"MD19Y hm"` would translate s_1 = `"11/15/91 21:14"` as 15nov1991 21:14. The space in `"MD19Y hm"` was not significant and the string would have translated just as well with `"MD19Yhm"`.

Y provides an alternate way of handling two-digit years. Y specifies the largest year that is to be returned when a two-digit year is encountered; see function `date()` below. If neither ## nor Y is specified, `clock()` returns *missing* when it encounters a two-digit year.

Domain s_1: strings
Domain s_2: strings
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999) or *missing*

`clockdiff(`e_{tc1}`,`e_{tc2}`,`s_u`)`

Description: the difference, rounded down to an integer, from e_{tc1} to e_{tc2} in s_u units of days, hours, minutes, seconds, or milliseconds

Note that `clockdiff(`e_{tc1}`,`e_{tc2}`,`s_u`)` = −`clockdiff(`e_{tc2}`,`e_{tc1}`,`s_u`)`.

Domain e_{tc1}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)
Domain e_{tc2}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)
Domain s_u: strings `"day"` or `"d"` for day; `"hour"` or `"h"` for hour; `"minute"`, `"min"`, or `"m"` for minute; `"second"`, `"sec"`, or `"s"` for second; and `"millisecond"` or `"ms"` for millisecond (case insensitive)
Range: integers −312,413,759,999,999 to 312,413,759,999,999 or *missing*

`Cmdyhms(`M`,`D`,`Y`,`h`,`m`,`s`)`

Description: the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) corresponding to M, D, Y, h, m, s
Domain M: integers 1 to 12
Domain D: integers 1 to 31
Domain Y: integers 0100 to 9999 (but probably 1800 to 2100)
Domain h: integers 0 to 23
Domain m: integers 0 to 59
Domain s: reals 0.000 to 60.999
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds) or *missing*

`Cofc(`e_{tc}`)`

Description: the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) of e_{tc} (ms. without leap seconds since 01jan1960 00:00:00.000)
Domain e_{tc}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)

`cofC(`e_{tC}`)`

Description: the e_{tc} datetime (ms. without leap seconds since 01jan1960 00:00:00.000) of e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)
Domain e_{tC}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)
Range datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)

`Cofd(`e_d`)`

Description: the e_{tC} datetime (ms. with leap seconds since 01jan1960 00:00:00.000) of date e_d at time 00:00:00.000
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)

`cofd(`e_d`)`

Description: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) of date e_d at time 00:00:00.000
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)

`daily(`s_1`,`s_2`[,`Y`])`

Description: a synonym for `date(`s_1`,`s_2`[,`Y`])`

`date(`s_1`,`s_2`[,`Y`])`

Description: the e_d date (days since 01jan1960) corresponding to s_1 based on s_2 and Y

s_1 contains the date, recorded as a string, in virtually any format. Months can be spelled out, abbreviated (to three characters), or indicated as numbers; years can include or exclude the century; blanks and punctuation are allowed.

s_2 is any permutation of `M`, `D`, and [##]Y, with their order defining the order that month, day, and year occur in s_1. ##, if specified, indicates the default century for two-digit years in s_1. For instance, s_2 = `"MD19Y"` would translate s_1 = `"11/15/91"` as 15nov1991.

Y provides an alternate way of handling two-digit years. When a two-digit year is encountered, the largest year, *topyear*, that does not exceed Y is returned.

```
date("1/15/08","MDY",1999) = 15jan1908
date("1/15/08","MDY",2019) = 15jan2008

date("1/15/51","MDY",2000) = 15jan1951
date("1/15/50","MDY",2000) = 15jan1950
date("1/15/49","MDY",2000) = 15jan1949

date("1/15/01","MDY",2050) = 15jan2001
date("1/15/00","MDY",2050) = 15jan2000
```

If neither ## nor Y is specified, `date()` returns *missing* when it encounters a two-digit year. See *Working with two-digit years* in [D] **Datetime conversion** for more information.

Domain s_1: strings
Domain s_2: strings
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549) or *missing*

`datediff(`e_{d1}`,`e_{d2}`,`s_1`[,`s_2`])`

Description: the difference, rounded down to an integer, from e_{d1} to e_{d2} in s_1 units of days, months, or years with s_2 the nonleap-year anniversary for e_{d1} on 29feb

s_2 specifies the anniversary when e_{d1} is on 29feb. s_2 = `"01mar"` (the default) means the anniversary is taken to be 01mar. s_2 = `"28feb"` means the anniversary is taken to be 28feb. See *Methods and formulas*.

Note that `datediff(`e_{d1}`,`e_{d2}`,`s_1`,`s_2`)` = −`datediff(`e_{d2}`,`e_{d1}`,`s_1`,`s_2`)`.

Domain e_{d1}: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain e_{d2}: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain s_1: strings `"day"` or `"d"` for day; `"month"`, `"mon"`, or `"m"` for month; and `"year"` or `"y"` for year (case insensitive)
Domain s_2: strings `"28feb"`, `"feb28"`, `"01mar"`, `"1mar"`, `"mar01"`, and `"mar1"` (case insensitive)
Range: integers −3,615,169 to 3,615,169 or *missing*

`datediff_frac(`e_{d1}`,`e_{d2}`,`s_1`[ ,`s_2`])`

Description: the difference, including the fractional part, from e_{d1} to e_{d2} in s_1 units of days, months, or years with s_2 the nonleap-year anniversary for e_{d1} on 29feb

s_2 specifies the anniversary when e_{d1} is on 29feb. s_2 = `"01mar"` (the default) means the anniversary is taken to be 01mar. s_2 = `"28feb"` means the anniversary is taken to be 28feb. See *Methods and formulas*.

Note that `datediff_frac(`e_{d1}`,`e_{d2}`,`s_1`,`s_2`)` = −`datediff_frac(`e_{d2}`,`e_{d1}`,`s_1`,`s_2`)`.

Domain e_{d1}: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain e_{d2}: `%td` dates 01jan0101 to 31dec9998 (integers −678,985 to 2,936,184)
Domain s_1: strings `"day"` or `"d"` for day; `"month"`, `"mon"`, or `"m"` for month; and `"year"` or `"y"` for year (case insensitive)
Domain s_2: strings `"28feb"`, `"feb28"`, `"01mar"`, `"1mar"`, `"mar01"`, and `"mar1"` (case insensitive)
Range: reals −3,615,169 to 3,615,169 or *missing*

`day(`e_d`)`

Description: the numeric day of the month corresponding to e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: integers 1 to 31 or *missing*

`dhms(`e_d`,`h`,`m`,`s`)`

Description: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to e_d, h, m, and s
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Domain h: integers 0 to 23
Domain m: integers 0 to 59
Domain s: reals 0.000 to 59.999
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999) or *missing*

`dofb(`e_b`,"`cal`")`

Description: the e_d datetime corresponding to e_b
Domain e_b: `%tb` as defined by business calendar named cal
Domain cal: business calendar names and formats
Range: as defined by business calendar named cal

`dofC(`e_{tC}`)`

Description: the e_d date (days since 01jan1960) of datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)
Domain e_{tC}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)
Range: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)

`dofc(`e_{tc}`)`

Description: the e_d date (days since 01jan1960) of datetime e_{tc} (ms. since 01jan1960 00:00:00.000)
Domain e_{tc}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)
Range: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)

`dofh(`e_h`)`
Description: the e_d date (days since 01jan1960) of the start of half-year e_h
Domain e_h: `%th` dates 0100h1 to 9999h2 (integers −3,720 to 16,079)
Range: `%td` dates 01jan0100 to 01jul9999 (integers −679,350 to 2,936,366)

`dofm(`e_m`)`
Description: the e_d date (days since 01jan1960) of the start of month e_m
Domain e_m: `%tm` dates 0100m1 to 9999m12 (integers −22,320 to 96,479)
Range: `%td` dates 01jan0100 to 01dec9999 (integers −679,350 to 2,936,519)

`dofq(`e_q`)`
Description: the e_d date (days since 01jan1960) of the start of quarter e_q
Domain e_q: `%tq` dates 0100q1 to 9999q4 (integers −7,440 to 32,159)
Range: `%td` dates 01jan0100 to 01oct9999 (integers −679,350 to 2,936,458)

`dofw(`e_w`)`
Description: the e_d date (days since 01jan1960) of the start of week e_w
Domain e_w: `%tw` dates 0100w1 to 9999w52 (integers −96,720 to 418,079)
Range: `%td` dates 01jan0100 to 24dec9999 (integers −679,350 to 2,936,542)

`dofy(`e_y`)`
Description: the e_d date (days since 01jan1960) of 01jan in year e_y
Domain e_y: `%ty` dates 0100 to 9999 (integers 0100 to 9999)
Range: `%td` dates 01jan0100 to 01jan9999 (integers −679,350 to 2,936,185)

`dow(`e_d`)`
Description: the numeric day of the week corresponding to date e_d; 0 = Sunday, 1 = Monday, ..., 6 = Saturday
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: integers 0 to 6 or *missing*

`doy(`e_d`)`
Description: the numeric day of the year corresponding to date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: integers 1 to 366 or *missing*

`halfyear(`e_d`)`
Description: the numeric half of the year corresponding to date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: integers 1, 2, or *missing*

`halfyearly(`s_1`,`s_2`[ ,`Y` ])`
Description: the e_h half-yearly date (half-years since 1960h1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`
Domain s_1: strings
Domain s_2: strings `"HY"` and `"YH"`; `Y` may be prefixed with *##*
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: `%th` dates 0100h1 to 9999h2 (integers −3,720 to 16,079) or *missing*

`hh(`e_{tc}`)`
Description: the hour corresponding to datetime e_{tc} (ms. since 01jan1960 00:00:00.000)
Domain e_{tc}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)
Range: integers 0 through 23 or *missing*

`hhC(`e_{tC}`)`
Description: the hour corresponding to datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)
Domain e_{tC}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)
Range: integers 0 through 23 or *missing*

`hms(`h`,`m`,`s`)`
Description: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to h, m, s on 01jan1960
Domain h: integers 0 to 23
Domain m: integers 0 to 59
Domain s: reals 0.000 to 59.999
Range: datetimes 01jan1960 00:00:00.000 to 01jan1960 23:59:59.999 (integers 0 to 86,399,999 or *missing*)

`hofd(`e_d`)`
Description: the e_h half-yearly date (half years since 1960h1) containing date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: `%th` dates 0100h1 to 9999h2 (integers −3,720 to 16,079)

`hours(`ms`)`
Description: ms/3,600,000
Domain ms: real; milliseconds
Range: real or *missing*

`isleapyear(`Y`)`
Description: `1` if Y is a leap year; otherwise, `0`
Domain Y: integers 0100 to 9999 (but probably 1800 to 2100)
Range: 0, 1, or *missing*

`mdy(`M`,`D`,`Y`)`
Description: the e_d date (days since 01jan1960) corresponding to M, D, Y
Domain M: integers 1 to 12
Domain D: integers 1 to 31
Domain Y: integers 0100 to 9999 (but probably 1800 to 2100)
Range: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549) or *missing*

`mdyhms(`M`,`D`,`Y`,`h`,`m`,`s`)`
Description: the e_{tc} datetime (ms. since 01jan1960 00:00:00.000) corresponding to M, D, Y, h, m, s
Domain M: integers 1 to 12
Domain D: integers 1 to 31
Domain Y: integers 0100 to 9999 (but probably 1800 to 2100)
Domain h: integers 0 to 23
Domain m: integers 0 to 59
Domain s: reals 0.000 to 59.999
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999) or *missing*

`minutes(`ms`)`
Description: $ms/60{,}000$
Domain ms: real; milliseconds
Range: real or *missing*

`mm(`e_{tc}`)`
Description: the minute corresponding to datetime e_{tc} (ms. since 01jan1960 00:00:00.000)
Domain e_{tc}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)
Range: integers 0 through 59 or *missing*

`mmC(`e_{tC}`)`
Description: the minute corresponding to datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)
Domain e_{tC}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)
Range: integers 0 through 59 or *missing*

`mofd(`e_d`)`
Description: the e_m monthly date (months since 1960m1) containing date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: `%tm` dates 0100m1 to 9999m12 (integers −22,320 to 96,479)

`month(`e_d`)`
Description: the numeric month corresponding to date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: integers 1 to 12 or *missing*

`monthly(`s_1`,`s_2`[,`Y`])`
Description: the e_m monthly date (months since 1960m1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`
Domain s_1: strings
Domain s_2: strings `"MY"` and `"YM"`; `Y` may be prefixed with `##`
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: `%tm` dates 0100m1 to 9999m12 (integers −22,320 to 96,479) or *missing*

`msofhours(`h`)`
Description: $h \times 3{,}600{,}000$
Domain h: real; hours
Range: real or *missing*; milliseconds

`msofminutes(`m`)`
Description: $m \times 60{,}000$
Domain m: real; minutes
Range: real or *missing*; milliseconds

`msofseconds(`s`)`
Description: $s \times 1{,}000$
Domain s: real; seconds
Range: real or *missing*; milliseconds

`nextbirthday(`$e_{d\,\mathrm{DOB}}$`,`e_d`[ ,`s_d`])`
Description: the e_d date of the first birthday after e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates

s_d specifies when someone born on 29feb becomes another year older in nonleap years. s_d = `"01mar"` (the default) means the birthday is taken to be 01mar. s_d = `"28feb"` means the birthday is taken to be 28feb. See *Methods and formulas*.
Domain $e_{d\,\mathrm{DOB}}$: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Domain s_d: strings `"28feb"`, `"feb28"`, `"01mar"`, `"1mar"`, `"mar01"`, and `"mar1"` (case insensitive)
Range: `%td` dates 01jan0101 to 31dec9999 (integers −678,985 to 2,936,549) or *missing*

`nextleapyear(`Y`)`
Description: the first leap year after year Y
Domain Y: integers 0100 to 9999 (but probably 1800 to 2100)
Range: integers 1584 to 9996 or *missing*

`previousbirthday(`$e_{d\,\mathrm{DOB}}$`,`e_d`[ ,`s_d`])`
Description: the e_d date of the birthday immediately before e_d for date of birth $e_{d\,\mathrm{DOB}}$ with s_d the nonleap-year birthday for 29feb birthdates

s_d specifies when someone born on 29feb becomes another year older in nonleap years. s_d = `"01mar"` (the default) means the birthday is taken to be 01mar. s_d = `"28feb"` means the birthday is taken to be 28feb. See *Methods and formulas*.
Domain $e_{d\,\mathrm{DOB}}$: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Domain s_d: strings `"28feb"`, `"feb28"`, `"01mar"`, `"1mar"`, `"mar01"`, and `"mar1"` (case insensitive)
Range: `%td` dates 01jan0100 to 31dec9998 (integers −679,350 to 2,936,184) or *missing*

`previousleapyear(`Y`)`
Description: the leap year immediately before year Y
Domain Y: integers 0100 to 9999 (but probably 1800 to 2100)
Range: integers 1584 to 9996 or *missing*

`qofd(`e_d`)`
Description: the e_q quarterly date (quarters since 1960q1) containing date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: `%tq` dates 0100q1 to 9999q4 (integers −7,440 to 32,159)

`quarter(`e_d`)`
Description: the numeric quarter of the year corresponding to date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: integers 1 to 4 or *missing*

`quarterly(`s_1`,`s_2`[ ,`Y` ])`
Description: the e_q quarterly date (quarters since 1960q1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`
Domain s_1: strings
Domain s_2: strings `"QY"` and `"YQ"`; `Y` may be prefixed with *##*
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: `%tq` dates 0100q1 to 9999q4 (integers −7,440 to 32,159) or *missing*

`seconds(`ms`)`
Description: ms/1,000
Domain ms: real; milliseconds
Range: real or *missing*

`ss(`e_{tc}`)`
Description: the second corresponding to datetime e_{tc} (ms. since 01jan1960 00:00:00.000)
Domain e_{tc}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)
Range: real 0.000 through 59.999 or *missing*

`ssC(`e_{tC}`)`
Description: the second corresponding to datetime e_{tC} (ms. with leap seconds since 01jan1960 00:00:00.000)
Domain e_{tC}: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)
Range: real 0.000 through 60.999 or *missing*

`tC(`l`)`
Description: convenience function to make typing dates and times in expressions easier

Same as `tc()`, except returns leap second–adjusted values; for example, typing `tc(29nov2007 9:15)` is equivalent to typing `1511946900000`, whereas `tC(29nov2007 9:15)` is `1511946923000`.
Domain l: datetime literal strings 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999+number of leap seconds)

`tc(`l`)`
Description: convenience function to make typing dates and times in expressions easier

For example, typing `tc(2jan1960 13:42)` is equivalent to typing `135720000`; the date but not the time may be omitted, and then 01jan1960 is assumed; the seconds portion of the time may be omitted and is assumed to be 0.000; `tc(11:02)` is equivalent to typing `39720000`.
Domain l: datetime literal strings 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999
Range: datetimes 01jan0100 00:00:00.000 to 31dec9999 23:59:59.999 (integers −58,695,840,000,000 to 253,717,919,999,999)

`td(`l`)`
Description: convenience function to make typing dates in expressions easier

For example, typing `td(2jan1960)` is equivalent to typing `1`.
Domain l: date literal strings 01jan0100 to 31dec9999
Range: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)

`th(`l`)`
Description: convenience function to make typing half-yearly dates in expressions easier

For example, typing `th(1960h2)` is equivalent to typing `1`.
Domain l: half-year literal strings 0100h1 to 9999h2
Range: `%th` dates 0100h1 to 9999h2 (integers −3,720 to 16,079)

`tm(`l`)`
Description: convenience function to make typing monthly dates in expressions easier

For example, typing `tm(1960m2)` is equivalent to typing `1`.
Domain l: month literal strings 0100m1 to 9999m12
Range: `%tm` dates 0100m1 to 9999m12 (integers −22,320 to 96,479)

`tq(`l`)`
Description: convenience function to make typing quarterly dates in expressions easier

For example, typing `tq(1960q2)` is equivalent to typing `1`.
Domain l: quarter literal strings 0100q1 to 9999q4
Range: `%tq` dates 0100q1 to 9999q4 (integers −7,440 to 32,159)

`tw(`l`)`
Description: convenience function to make typing weekly dates in expressions easier

For example, typing `tw(1960w2)` is equivalent to typing `1`.
Domain l: week literal strings 0100w1 to 9999w52
Range: `%tw` dates 0100w1 to 9999w52 (integers −96,720 to 418,079)

`week(`e_d`)`
Description: the numeric week of the year corresponding to date e_d, the `%td` encoded date (days since 01jan1960)

Note: The first week of a year is the first 7-day period of the year.
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range integers 1 to 52 or *missing*

`weekly(`s_1`,`s_2`[,`Y`])`
Description: the e_w weekly date (weeks since 1960w1) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`
Domain s_1: strings
Domain s_2: strings `"WY"` and `"YW"`; `Y` may be prefixed with *##*
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: `%tw` dates 0100w1 to 9999w52 (integers −96,720 to 418,079) or *missing*

`wofd(`e_d`)`
Description: the e_w weekly date (weeks since 1960w1) containing date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: `%tw` dates 0100w1 to 9999w52 (integers −96,720 to 418,079)

`year(`e_d`)`
Description: the numeric year corresponding to date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: integers 0100 to 9999 (but probably 1800 to 2100)

`yearly(`s_1`,`s_2`[,`Y`])`
Description: the e_y yearly date (year) corresponding to s_1 based on s_2 and Y; Y specifies *topyear*; see `date()`
Domain s_1: strings
Domain s_2: string `"Y"`; `Y` may be prefixed with *##*
Domain Y: integers 1000 to 9998 (but probably 2001 to 2099)
Range: `%ty` dates 0100 to 9999 (integers 0100 to 9999) or *missing*

`yh(`Y`,`H`)`
Description: the e_h half-yearly date (half-years since 1960h1) corresponding to year Y, half-year H
Domain Y: integers 1000 to 9999 (but probably 1800 to 2100)
Domain H: integers 1, 2
Range: `%th` dates 1000h1 to 9999h2 (integers −1,920 to 16,079)

`ym(`Y`,`M`)`
Description: the e_m monthly date (months since 1960m1) corresponding to year Y, month M
Domain Y: integers 1000 to 9999 (but probably 1800 to 2100)
Domain M: integers 1 to 12
Range: `%tm` dates 1000m1 to 9999m12 (integers −11,520 to 96,479)

`yofd(`e_d`)`
Description: the e_y yearly date (year) containing date e_d
Domain e_d: `%td` dates 01jan0100 to 31dec9999 (integers −679,350 to 2,936,549)
Range: `%ty` dates 0100 to 9999 (integers 0100 to 9999)

`yq(`Y`,`Q`)`
Description: the e_q quarterly date (quarters since 1960q1) corresponding to year Y, quarter Q
Domain Y: integers 1000 to 9999 (but probably 1800 to 2100)
Domain Q: integers 1 to 4
Range: `%tq` dates 1000q1 to 9999q4 (integers −3,840 to 32,159)

`yw(`Y`,`W`)`
Description: the e_w weekly date (weeks since 1960w1) corresponding to year Y, week W
Domain Y: integers 1000 to 9999 (but probably 1800 to 2100)
Domain W: integers 1 to 52
Range: `%tw` dates 1000w1 to 9999w52 (integers −49,920 to 418,079)

Remarks and examples

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Stata's date and time functions are described with examples in **[U] 25 Working with dates and times**, [D] **Datetime**, [D] **Datetime durations**, and [D] **Datetime relative dates**.

Video example

How to create a date variable from a date stored as a string

Methods and formulas

The functions `age()` and `age_frac()` are based on `datediff()` and `datediff_frac()`, respectively,

$$\texttt{age}(e_{d\,\text{DOB}},e_d,s_d) = \texttt{datediff}(e_{d\,\text{DOB}},e_d,\texttt{"year"},s_d)$$

and

$$\texttt{age\_frac}(e_{d\,\text{DOB}},e_d,s_d) = \texttt{datediff\_frac}(e_{d\,\text{DOB}},e_d,\texttt{"year"},s_d)$$

when $e_d \geq e_{d\,\text{DOB}}$. When $e_d < e_{d\,\text{DOB}}$, `age()` and `age_frac()` return *missing* (`.`).

`datediff`$(e_{d1},e_{d2},$`"year"`$,s_d)$ returns an integer that is the number of years between e_{d1} and e_{d2}. Assume $e_{d2} \geq e_{d1}$. If the month and day of e_{d2} are the same or after the month and day of e_{d1}, it returns `year`(e_{d2}) − `year`(e_{d1}). If the month and day of e_{d2} are before the month and day of e_{d1}, it returns `year`(e_{d2}) − `year`(e_{d1}) − 1.

If $e_{d2} < e_{d1}$, the result is calculated using

$$\texttt{datediff}(e_{d1},e_{d2},\texttt{"year"},s_d) = -\texttt{datediff}(e_{d2},e_{d1},\texttt{"year"},s_d))$$

This formula also holds for units of `"month"` and `"day"` and for `datediff_frac()`.

`datediff`$(e_{d1},e_{d2},$`"year"`$,s_d)$ has an optional fourth argument, s_d, that applies only to a starting date e_{d1} on 29feb when the ending date e_{d2} is not in a leap year. There are two possible values for s_d: either `"01mar"` (with equivalents `"1mar"`, `"mar01"`, `"mar1"`) or `"28feb"` (`"feb28"`). When `"01mar"` is specified and e_{d1} is on 29feb, `datediff()` increases by one in nonleap years when e_{d2} goes to 01mar. When `"28feb"` is specified and e_{d1} is on 29feb, it increases by one in nonleap years when e_{d2} goes to 28feb.

In other words, s_d sets the anniversary date (or birthday) in nonleap years for starting dates (or dates of birth) on 29feb. When the fourth argument is omitted, it is as if `"01mar"` was specified.

Regardless of the value of s_d, when e_{d1} is on 29feb, `datediff(...,"year",...)` increases by one in leap years when e_{d2} goes to 29feb.

`datediff_frac`$(e_{d1},e_{d2},$`"year"`$,s_d)$ is defined similarly. `datediff_frac(...,"year",...)` is exactly an integer and equal to `datediff(...,"year",...)` for days e_{d2} on which `datediff()` increases by one from the day previous to e_{d2}.

The fractional part of `datediff_frac`$(e_{d1},e_{d2},$`"year"`$,s_d)$ is calculated by first counting the number of days, d_1, from the closest date prior to e_{d2} that has an exact integer value of `datediff_frac(...,"year",...)` to e_{d2}. Then number of the days, d_2, from e_{d2} to the closest following date that has an exact integer value of `datediff_frac()` is determined. The fractional part is $d_1/(d_1+d_2)$, and d_1+d_2 is either 365 or 366.

For examples, see example 1 and example 3 in [D] **Datetime durations**.

`datediff`$(e_{d1},e_{d2},$`"month"`$,s_d)$ and `datediff_frac`$(e_{d1},e_{d2},$`"month"`$,s_d)$ follow the corresponding definitions with `"year"`. `datediff(...,"month",...)` increases to an integer multiple of 12 when `datediff(...,"year",...)` increases by one from the day previous to e_{d2}. `datediff_frac(...,"month",...)` is exactly 12 times `datediff_frac(...,"year",...)` when `datediff_frac(...,"year",...)` is an integer.

`datediff(`e_{d1}`,`e_{d2}`,"month",`s_d`)` increases by one from the day previous to e_{d2} when `day(`e_{d2}`)` = `day(`e_{d1}`)`. If there is no `day(`e_{d1}`)` in the month, then it increases by one on the first day of the next month. For example, if e_{d1} is on 30aug, then `datediff(...,"month",...)` increases by one when e_{d2} goes to 30sep. If e_{d1} is on 31aug, then `datediff(...,"month",...)` increases by one when e_{d2} goes to 01oct.

The optional fourth argument, s_d, again sets the date, either `"01mar"` or `"28feb"`, when `datediff(...,"month",...)` increases by one when e_{d1} is on 29feb.

`datediff_frac(...,"month",...)` is defined like `datediff_frac(..., "year",...)`. Days on which `datediff_frac(...,"month",...)` is an exact integer are determined, and the fractional part for other days is determined by interpolating between these days. The denominator of the fractional part is 28, 29, 30, or 31.

See example 2 of `datediff()` and `datediff_frac()` for months in [D] **Datetime durations**.

`datediff(`e_{d1}`,`e_{d2}`,"day",`s_d`)` and `datediff_frac(`e_{d1}`,`e_{d2}`,"day",`s_d`)` have no such complications. Both are equal to $e_{d2} - e_{d1}$ and are always integers. The optional fourth argument has no bearing on the calculation and is ignored.

References

Cox, N. J. 2018. Stata tip 130: 106610 and all that: Date variables that need to be fixed. *Stata Journal* 18: 755–757.

——. 2019. Speaking Stata: The last day of the month. *Stata Journal* 19: 719–728.

Rajbhandari, A. 2015. A tour of datetime in Stata. *The Stata Blog: Not Elsewhere Classified.* http://blog.stata.com/2015/12/17/a-tour-of-datetime-in-stata-i/.

Also see

[FN] **Functions by category**

[D] **Datetime** — Date and time values and variables

[D] **Datetime durations** — Obtaining and working with durations

[D] **Datetime relative dates** — Obtaining dates and date information from other dates

[D] **egen** — Extensions to generate

[D] **generate** — Create or change contents of variable

[M-5] **date( )** — Date and time manipulation

[U] **13.3 Functions**

[U] **25 Working with dates and times**