

Funtimes (and fundates) with lubridate

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Dates and times are complicated

Dates and times in R are worse

Familiar?

```
this_date <- "2014-03-31"  
day <- sub("\\d{4}-\\d{2}-(\\d{2})", "\\1", this_date)  
sub("\\d{2}$", as.numeric(day)+1, this_date)
```

```
## [1] "2014-03-32"
```

What about...

```
this_date <- as.numeric(strsplit("2014-02-28", "-")[[1]])
that_date <- as.numeric(strsplit("2014-03-01", "-")[[1]])

secs <-
  sum(that_date * c(365*24*60*60, 30*24*60*60, 24*60*60)) -
  sum(this_date * c(365*24*60*60, 30*24*60*60, 24*60*60))
secs

## [1] 259200

secs/(60*60*24)

## [1] 3
```



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Dates and Times Made Easy with lubridate

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An important lie

Human-readable dates can be specified in
universally understood formats like 05/07/11

parsing dates

if you know the format:

```
library(lubridate)
ymd("2004-12-03")
```

```
## [1] "2004-12-03 UTC"
```

```
# as American-style date
mdy("03/04/11")
```

```
## [1] "2011-03-04 UTC"
```

```
# as Euro-style date
dmy("03/04/11")
```

```
## [1] "2011-04-03 UTC"
```

extracting parts of dates

```
today <- now()
```

```
today
```

```
## [1] "2014-07-17 10:03:03 BST"
```

```
month(today)
```

```
## [1] 7
```

```
month(today, label = TRUE, abbr = FALSE)
```

```
## [1] July
```

```
## 12 Levels: January < February < March < April < May < Ju
```

arithmetic

```
tomorrow <- today + days(1)
```

```
tomorrow
```

```
## [1] "2014-07-18 10:03:03 BST"
```

```
month_from_today <- today + months(1)
```

```
month_from_today
```

```
## [1] "2014-08-17 10:03:03 BST"
```

rounding

```
this.date <- ymd_hms("2004-04-08 12:54:15")  
round_date(this.date, "hour")
```

```
## [1] "2004-04-08 13:00:00 UTC"
```

```
floor_date(this.date, "hour")
```

```
## [1] "2004-04-08 12:00:00 UTC"
```

sequences

```
today + (0:5) * days(1)
```

```
## [1] "2014-07-17 10:03:03 BST" "2014-07-18 10:03:03 BST"
```

```
## [3] "2014-07-19 10:03:03 BST" "2014-07-20 10:03:03 BST"
```

```
## [5] "2014-07-21 10:03:03 BST" "2014-07-22 10:03:03 BST"
```

Some more lies

- ▶ There are always 24 hours in a day
- ▶ Months have either 30 or 31 days
- ▶ February is always 28 days long
- ▶ Years have 365 days
- ▶ There is a leap year every year divisible by 4

instants, durations and periods

- ▶ a date-time is an *instant*
- ▶ what if we want to specify a length of time
- ▶ *durations* are exact time spans recorded in seconds
- ▶ *periods* are inexact measures (seconds in a month changes)

intervals

```
dave_age <- new_interval(ymd_h("1986-01-29 03"), now())  
dave_age %/% years(1)
```

```
## [1] 28
```

```
dave_age %/% weeks(2)
```

```
## [1] 742
```

```
dave_age / dweeks(1)
```

```
## [1] 1485
```


lies about timezones

- ▶ Britain uses GMT
- ▶ Time zones always differ by a whole hour
- ▶ The offsets between two time zones will remain constant

timezones

```
dave_time <- ymd_h("2014-03-09 06")  
dave_time <- force_tz(dave_time,"America/New_York")  
eric_time <- ymd_h("2014-03-09 11")  
eric_time <- force_tz(eric_time,"Europe/London")  
interval(dave_time,eric_time)/dhours(1)
```

```
## [1] 1
```

```
with_tz(eric_time,tz="America/New_York")
```

```
## [1] "2014-03-09 07:00:00 EDT"
```

things I don't like

```
# arghhh!  
wday(today)
```

```
## [1] 5
```

```
# I think this should throw an error  
this_day <- ymd("2014-02-28")  
day(this_day) <- 34  
this_day
```

```
## [1] "2014-03-06 UTC"
```

example problem (Tiago)

Credit

- ▶ Noah Sussman's excellent (and unbelievable) list of untruths about time
`http://infiniteundo.com/post/25326999628/falsehoods-programmers-believe-about-time`
- ▶ Noah's follow-up article
`http://infiniteundo.com/post/25509354022/more-falsehoods-programmers-believe-about-time-wisdom`
- ▶ Dates and times made easy with lubridate by Grolemund & Wickham `http://www.jstatsoft.org/v40/i03`

Thanks!

Talk available at:

converged.yt/talks/rusers-time/talk.pdf

.Rmd available

converged.yt/talks/rusers-time/talk.Rmd