object-oriented systems in R

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Me:

- Data Scientist @Emarsys

- 3 years R

- started with C++, Python

You:

- R user without CS background

- understand core concepts

- explore & debug more effectively

```
summary(lm(y~x))
```

```
...
Coefficients:
...
Signif codes: 0 ‘***’
Multiple R-squared:  0.7262
```

```
summary(c(1:99, 10^6))
```

```
   Min.    :      1.0
1st Qu.:     25.8
Median :     50.5
Mean   :  10049.5
3rd Qu.:     75.2
Max.   :1000000.0
```

object = behavior + data

attend -> learn

talk at ->

feedback

organize -> proud

date: 2018-10-27

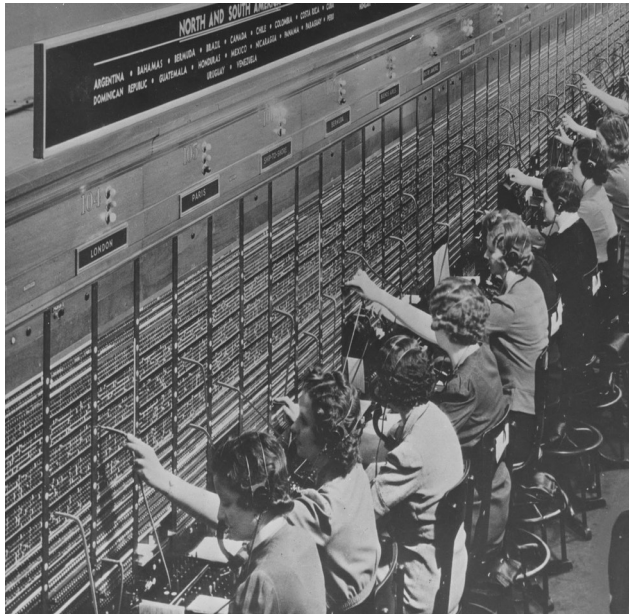
venue: Belgrade

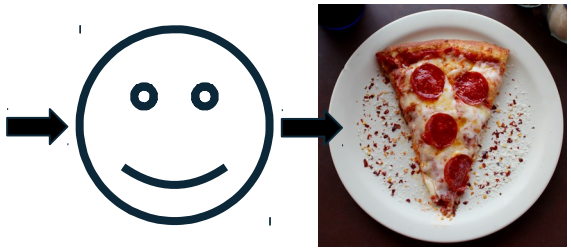
 # participants:

100+

S3

+36 1 333-3333





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lm(y~x)

summary

summary.lm

Coef
R^2

class
+
generic

→ dispatch method →

lm(y~x)
+
summary

→  → summary.lm

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details

class / object type

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type/class in R

integer
character
list
Date
data.frame
r_conference

base types

S3 types

method

summary.lm

generic **class**

~~as.factor~~

method

summary.data.frame

generic **class**

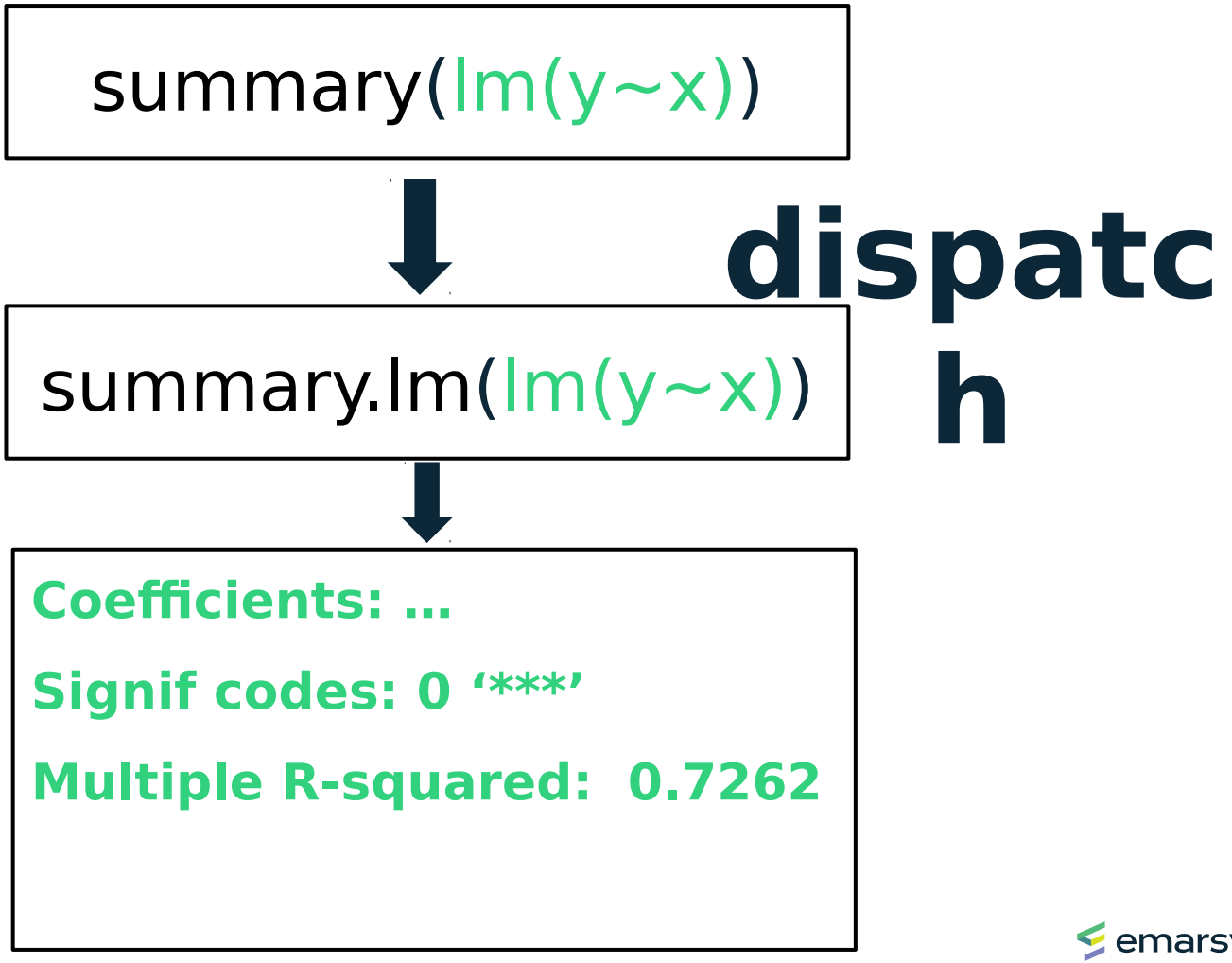
as.Date.numeric

generic **class**

generic

```
summary <- function(object, ...)
    UseMethod("summary")


sum <- function(..., na.rm = FALSE)
    .Primitive("sum")
```


summary(lm(y~x))
summary.lm(lm(y~x))
dispatch
Coefficients: …
Signif codes: 0 ‘***’
Multiple R-squared: 0.7262

why so powerful?

flexible & extensibl

base R + different packages work together

complex types can inherit behavior from simpler types

class is a vector

```
c(”r_conference”, “conference”, “event”)
```

most specific □ □ □ least specific

specialize

- print(data.table())
- print.data.table(data.table())

```
    Sepal.Length Sepal.Width
1:          5.1         3.5
2:          4.9         3.0
3:          4.7         3.2
4:          4.6         3.1
5:          5.0         3.6
---
146:        6.7         3.0
147:        6.3         2.5
148:        6.5         3.0
149:        6.2         3.4
150:        5.9         3.0
```

- print(data.frame())
- print.data.frame(data.frame())

```
    Sepal.Length Sepal.Width
1            5.1         3.5
2            4.9         3.0
3            4.7         3.2
4            4.6         3.1
5            5.0         3.6
6            5.4         3.9
7            4.6         3.4
8            5.0         3.4
9            4.4         2.9
10           4.9         3.1

...
```

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fallback

- summary(data.table())
- ~~summary.data.table(data.table())~~
- summary.data.frame(data.table())

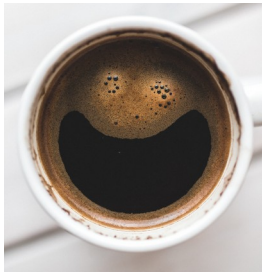
```
 Sepal.Length
Min.   :4.300
1st Qu.:5.100
Median :5.800
Mean   :5.843
3rd Qu.:6.400
Max.   :7.900
```

- summary(data.frame())
- summary.data.frame(data.frame())

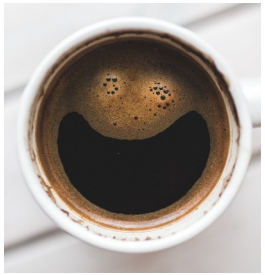
```
 Sepal.Length
Min.   :4.300
1st Qu.:5.100
Median :5.800
Mean   :5.843
3rd Qu.:6.400
Max.   :7.900
```

extend

gift.conference



gift.r_conference



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learn more

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explore

- seq.Date
- data.table:::print.data.table
- lookup::lookup(“sum”) – Jim Hester
- https://github.com/wch/r-source

explore

- sloop – R package by Hadley Wickham
- s3_class, ftype
- s3_dispatch
- s3_methods_class, s3_methods_generic

Advanced R by Hadley Wickham

https://www.ildiczeller.com/2018/04/02/investigating-difftime-behavior/

take-away

use

understand

(create)