

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



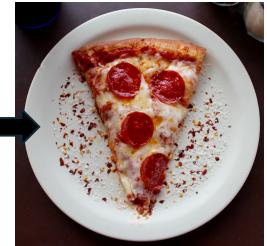
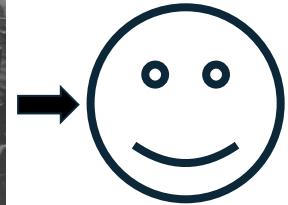
date: 2018-05-15

venue: Budapest

participants: 450

s3

+36 1 333-3333



$\text{Im}(y \sim x)$



summary



$\rightarrow \text{summary}.\text{Im} \rightarrow \text{Coef}$
 R^2

class

+

→

dispatch → method

generic

lm(y~x)

+

→

summary



→ **summary.lm**

details

class / object type



class/type 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))
```



dispatch

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



Coefficients: ...

Signif codes: 0 ‘***’

Multiple R-squared: 0.7262

why so
powerful?

**flexible &
extensible**

**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  
...  
...
```

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



learn more

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)