

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



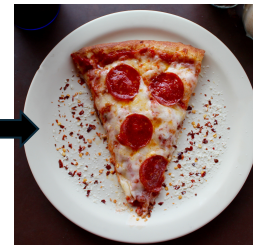
date: 2018-05-15

venue: Budapest

participants: 450

S3

+36 1 333-3333



$lm(y \sim x)$



summary



summary.lm



**Coef
R²**

class
+
generic → **dispatch** → **method**

$\text{lm}(y \sim x)$
+
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)