Connect to a database

Up to now

- Flat files

- Excel files

Relational Databases

- What is a relational database?

- How to connect?

- How to read table?

company

company

employees		
id	name	started_at
1	Tom	2009-05-17
4	Frank	2012-07-06
6	Julie	2013-01-01
7	Heather	2014-11-23
9	John	2014-11-23

company

	employees	
id	name	started_at
1	Tom	2009-05-17
4	Frank	2012-07-06
6	Julie	2013-01-01
7	Heather	2014-11-23
9	John	2014-11-23

	products	
id	name	contract
1	Easy Call	0
2	Call Plus	1
5	Small Biz	0
9	Biz Unlimited	1

company

employees

id	name	started_at
1	Tom	2009-05-17
4	Frank	2012-07-06
6	Julie	2013-01-01
7	Heather	2014-11-23
9	John	2014-11-23

sales

id	employee_id	product_id	date	price
1	4	5	2015-09-05	99
2	7	2	2015-09-14	75
3	6	9	2015-09-18	152
4	9	2	2015-09-21	66
5	9	5	2015-09-21	70
7	1	5	2015-09-22	41
8	6	1	2015-09-24	86
9	9	9	2015-09-27	209

products

id	name	contract
1	Easy Call	0
2	Call Plus	1
5	Small Biz	0
9	Biz Unlimited	1

company

employees

id	name	started_at
1	Tom	2009-05-17
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relation

sales

id	employee_id	product_id	date	price
1	4	5	2015-09-05	99
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5	9	5	2015-09-21	70
7	1	5	2015-09-22	41
8	6	1	2015-09-24	86
9	9	9	2015-09-27	209

products

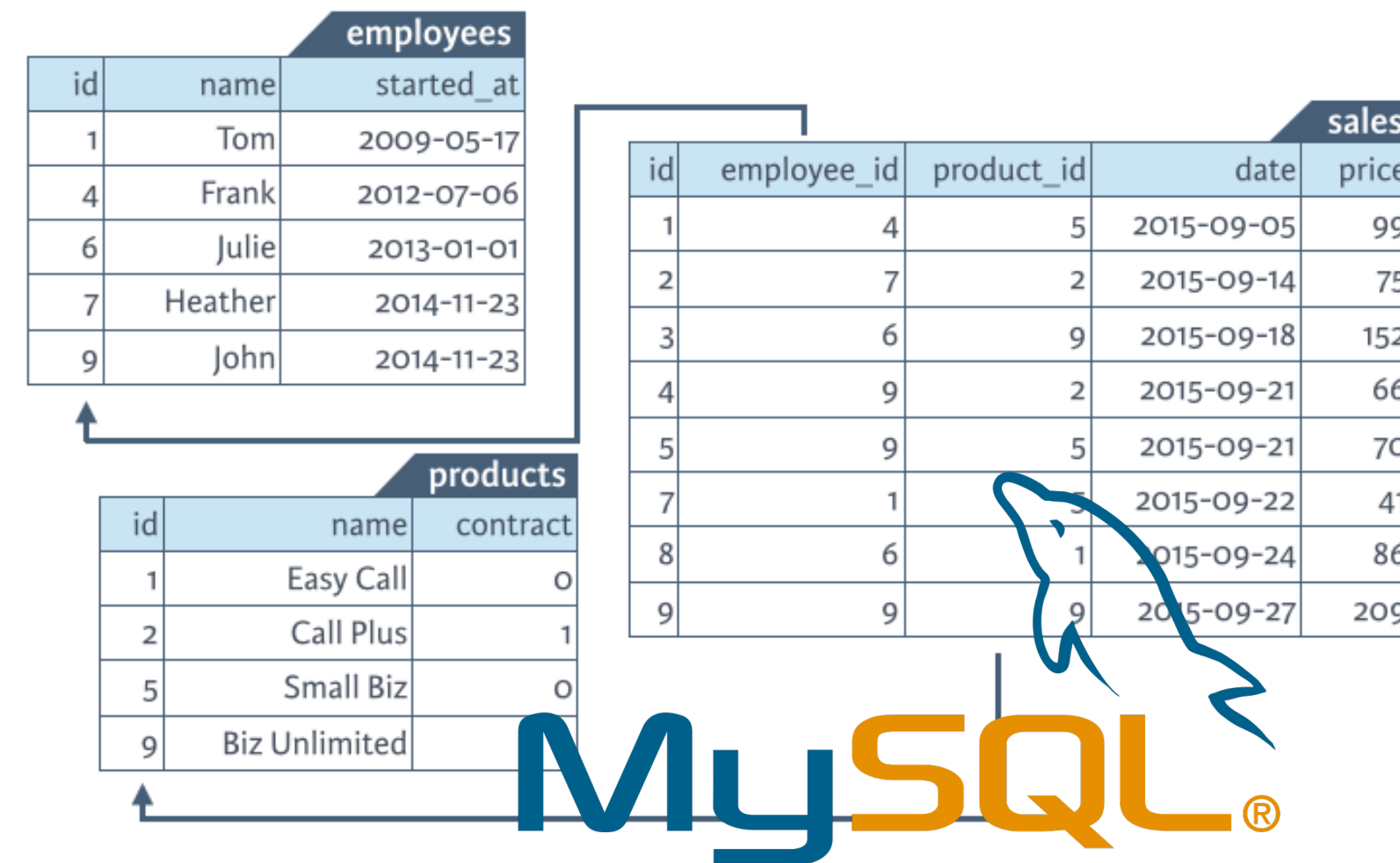| id	name	contract
1	Easy Call	0
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relation

Database Management System

- DBMS

- Open source

  - MySQL, PostgreSQL, SQLite

- Proprietary

  - Oracle Database, Microsoft SQL Server

- SQL = Structured Query Language

Databases in R

- Different R packages

- MySQL — RMySQL

- PostgresSQL — RPostgresSQL

- Oracle Database — ROracle

- Conventions specified in DBI

```
> install.packages("RMySQL")
> library(DBI)    # library(RMySQL) not required
```

Connect to database

Construct SQL driver

```
> con <- dbConnect(RMySQL::MySQL(),
          dbname = "company",
          host = "courses.csrrinzqubik.us-
                      east-1.rds.amazonaws.com",
          port = 3306,
          user = "student",
          password = "datacamp")
```

con is DBIConnection object

IMPORTING DATA IN R

Let's practice!

Import table data

con

```
> con <- dbConnect(RMySQL::MySQL(),
          dbname = "company",
          host = "courses.csrrinzqubik.us-
                      east-1.rds.amazonaws.com",
          port = 3306,
          user = "student",
          password = "datacamp")
```

List and import tables

id	name	started_at
1	Tom	2009-05-17
4	Frank	2012-07-06
6	Julie	2013-01-01
7	Heather	2014-11-23
9	John	2014-11-23

employees

```
> dbListTables(con)
[1] "employees" "products"  "sales"

> dbReadTable(con, "employees")

  id    name  started_at
1  1     Tom  2009-05-17
2  4   Frank  2012-07-06
3  6   Julie  2013-01-01
4  7 Heather  2014-11-23
5  9    John  2015-05-12

> dbDisconnect(con)
[1] TRUE

> con
Error in .local(dbObj, ...) :
  internal error in RS_DBI_getConnection: ...
```

IMPORTING DATA IN R

Let's practice!