# **Data Types**

Type		Example	
Numeric	Integer	-1, 0, 1, 2, 56, 100001	
	"Float", "Real"	2.335, -6792.29388675465435687	
Categorical Binary		{0, 1}, {yes, no}, {alive, dead}	
	Nominal	{cat, dog, mouse}, {red, blue, green, yellow}	
	Ordinal	lowest, lower, middle, higher, highest	

## **Select/subset/slice columns**

**SQL:** SELECT X1 FROM TABLE1;

R: Table1\$X1

ID	X1	X2
123A	1	Α
1234	2	В
1235	3	С
1235B	4	D

```
SAS:
PROC PRINT DATA=TABLE1;
VAR X1;
RUN;
```

## **Select/subset/slice columns**

**SQL:** SELECT X1 FROM TABLE1;

R: Table1\$X1

ID	<b>X1</b>	X2		<b>X1</b>
123A	1	Α		1
1234	2	В		2
1235	3	С		3
1235B	4	D		4
_	-   -		•	

```
SAS:
PROC PRINT DATA=TABLE1;
VAR X1;
RUN;
```

### Select/subset/slice rows

**SQL:** SELECT X1 FROM TABLE1 WHERE X1 >= 3;

**R:** Table1[Table1\$X1 >= 3,]

ID	X1	X2
123A	1	Α
1234	2	В
1235	3	С
1235B	4	D

```
SAS:
PROC PRINT DATA=TABLE1;
WHERE X1 >= 3;
RUN;
```

### Select/subset/slice rows

**SQL:** SELECT X1 FROM TABLE1 WHERE X1 >= 3;

**R:** Table1[Table1\$X1 >= 3,]

ID	X1	X2		
123A	1	А	ID	X
1234	2	В	1235	3
1235	3	С	1235B	4
1235B	4	D		

Table1

SAS:
PROC PRINT DATA=TABLE1;
WHERE X1 >= 3;
RUN;

### **Group by**

**SQL:** SELECT ID, MEAN(X3) AS MEANX3 FROM TABLE2 GROUP BY ID;

**R:** summarise(group\_by(Table1, ID), meanx3 = mean(X3))

ID	Х3	
123A	5	
1234	6	
1235	7	
1235B	8	
1234	9	
1235	10	
1235B	11	

```
SAS:
PROC MEANS DATA=TABLE2 MEAN;
VAR X3;
BY ID;
RUN;
```

### **Group by**

**SQL:** SELECT ID, MEAN(X3) AS MEANX3 FROM TABLE2 GROUP BY ID;

**R:** summarise(group\_by(Table1, ID), MEANX3 = mean(X3))

ID	Х3
123A	5
1234	6
1235	7
1235B	8
1234	9
1235	10
1235B	11

```
SAS:
PROC MEANS DATA=TABLE2 MEAN;
VAR X3;
BY ID;
RUN;
```

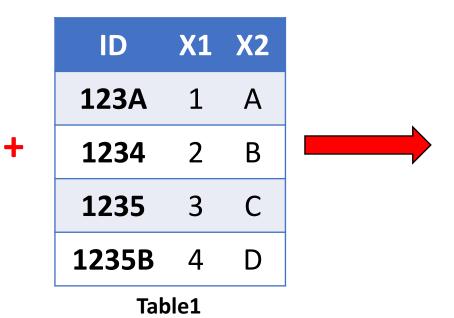
### **Left Join**

**SQL:** SELECT \* FROM TABLE1 LEFT JOIN TABLE2 ON TABLE1.ID = TABLE2.ID;

**R:** merge(x = Table2, y = Table1, by = 'ID', all.x = TRUE)

ID	Х3
123A	5
1234	6
1235	7
1235B	8
1234	9
1235	10
1235B	11

Table2



SAS:

DATA TABLE2;

MERGE TABLE2 TABLE1;

BY ID;

RUN;

### **Left Join**

**SQL:** SELECT \* FROM TABLE1 LEFT JOIN TABLE2 ON TABLE1.ID = TABLE2.ID;

**R:** merge(x = Table2, y = Table1, by = 'ID', all.x = TRUE)

Х3
5
6
7
8
9
10
11

Table2

ID	<b>X1</b>	X2
123A	1	Α
1234	2	В
1235	3	С
1235B	4	D
Tak	ole1	

ID	Х3	X1	X2
1234	6	2	В
1234	9	2	В
1235	7	3	С
1235	10	3	С
1235B	8	4	D
1235B	11	4	D
123A	5	1	Α

SAS:

DATA TABLE2;

MERGE TABLE2 TABLE1;

BY ID;

RUN;