SQL: single table queries I

Credit Dr. Bruns

What are the patients' last names?

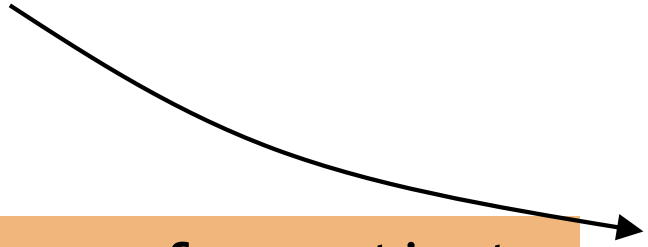
patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	M	25.02.95	6

The question in SQL:

```
select last_name from patient;
```

Evaluating the query

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	M	25.02.95	6



```
select last_name from patient;
```

last_name
Smith
Jones
Brown
Jenkins
Wells

What are patients' names?

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
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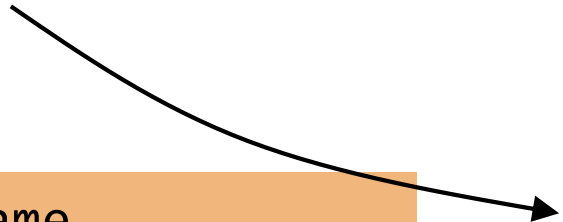


```
select first_name,
    last_name from patient;
```

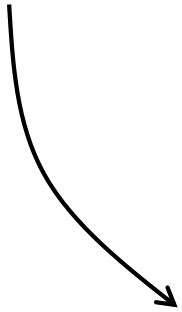
first_name	last_name
John	Smith
Peter	Jones
Brenda	Brown
Alan	Jenkins
Chris	Wells

note: result of the query is a **table**

Which patients in ward 6?

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	M	25.02.95	6

```
select patient_no
from patient
where ward = 6;
```

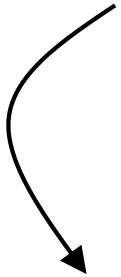


patient_no
454
244

What is the patient info for ward 6?

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	M	25.02.95	6

```
select * from patient
where ward = 6;
```



patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
244	Wells	Chris	M	25.02.95	6

Queries we've seen so far

```
select last_name from patient;
```

```
select first_name, last_name from patient;
```

```
select patient_no from patient where ward = 6;
```

```
select * from patient where ward = 6;
```

General form:

select columns **from** table **where** condition

Exercise questions

We know some operations of relational algebra, including:

- **union**
- **select**
- **project**

In this query:

```
select patient_no from patient where ward = 6
```

1. Is the blue part of the query a union, select, or project?
2. Is the orange part of the query a union, select, or project?

Computing the query result

We can compute the answer to this query

```
select patient_no from patient where ward = 6
```

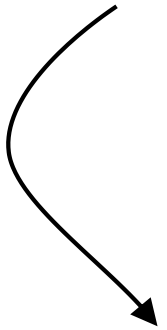
With the relational algebra expression:

$$\Pi_{\text{patient\_no}} (\sigma_{\text{ward=6}} (\text{patient}))$$

Which patients in ward 6 or 7?

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	M	25.02.95	6

```
select patient_no
from patient
where ward = 6 or ward = 7;
```

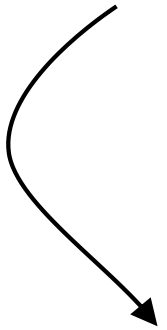


patient_no
454
234
244

Which male patients in ward 6 or 7?

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	F	25.02.95	6

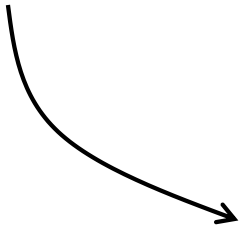
```
select patient_no
from patient
where (ward = 6 or ward = 7)
      and sex = M;
```



patient_no
454
234

Who are the patients, ordered by ward?

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	M	25.02.95	6

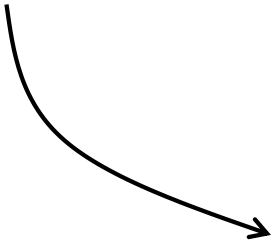


```
select * from patient order by ward;
```

patient_no	last_name	first_name	sex	date_of_birth	ward
597	Brown	Brenda	F	17.06.61	3
244	Wells	Chris	M	25.02.95	6
454	Smith	John	M	14.08.78	6
234	Jenkins	Alan	M	29.01.72	7
223	Jones	Peter	M	07.12.85	8

Reverse ordering

patient_no	last_name	first_name	sex	date_of_birth	ward
454	Smith	John	M	14.08.78	6
223	Jones	Peter	M	07.12.85	8
597	Brown	Brenda	F	17.06.61	3
234	Jenkins	Alan	M	29.01.72	7
244	Wells	Chris	F	25.02.95	6



```
select first_name, last_name
from patient
order by last_name desc;
```

first_name	last_name
Chris	Wells
John	Smith
Peter	Jones
Alan	Jenkins
Brenda	Brown

Summary

- We looked at simple SQL queries of the form

  select columns **from** table **where** condition

- **select** columns **from** (**select** * **from** table) **where** condition

Some people write SQL keywords in caps:

SELECT first_name, last_name FROM patient;