SELECT statement

Topic 4.2 database

- From Topic 4.1, updated with more data

Staff table

StaffID	StaffName	DateOfBirth	Salary
1	Buffy Winters	1987-09-15	27000.00
2	Teddy Bear	1983-12-03	87125.02
3	John Smith	1972-09-20	25000.00
4	Jane Doe	1969-01-25	55000.00
5	Jacek Jones	1984-10-19	35000.00
6	Mohammad Awrangjeb	1977-11-21	35000.00
7	Rupam Deb	1980-10-21	55000.00
8	Md Polash	1981-11-25	38000.00
9	Teddy Bear	1983-12-03	87125.02
10	Fred Smith	1956-06-30	25125.02

Department table

DepartmentID	DepartmentName	Budget	ManagerID
1	Sales	5005000	2
2	Marketing	509000	1
3	Finance	650000	5
4	Accounting	360000	3
5	Human Resource	550000	7

WorkAllocation table

StaffID	DepartmentID	PercentageTime
1	2	0.7
1	5	0.3
2	1	1
3	2	0.3
3	3	0.2
3	4	0.5
4	4	0.3
4	5	0.7
5	3	0.7
5	4	0.3
6	3	0.4
6	4	0.3
6	5	0.3
7	5	1
8	2	0.4
8	3	0.6
9	4	0.5
9	5	0.5
10	1	0.4
10	3	0.2
10	4	0.2
10	5	0.1

Select Statement

- **General Syntax**

```
SELECT [ALL | DISTINCT | DISTINCTROW ] select_expr [, select_expr ...]
FROM table_references
[WHERE where_condition]
[GROUP BY {col_name | expr | position} ]
[HAVING where_condition]
[ORDER BY {col_name | expr | position} [ASC | DESC], ...]
[LIMIT {[offset,] row_count | row_count OFFSET offset}]
```

- **ERD is a roadmap of the data**
  - What data – field names
  - From where come from - table names
  - How to traverse through the database (relationships between tables and keys)
- **Relational Database Schema**, additionally tells
  - Data types & formats

Select Statement

- **General Syntax**

Part	Purpose
ALL | DISTINCT | DISTINCTROW	Predicate - restricts the data rows returned, e.g. to avoid duplicates
select_expr	Specifies that all possible data columns are returned. Can use wildcard (*) or specify fieldnames
Table references	Specifies the tables that contain the data, together with the necessary inter-table relationships. Can utilise aliases.
Where	Specifies one or more conditions that must be true for each returned data row
Group by	Specifies grouping for the returned data.
Having	Specified one or more conditions that must be true for each returned data group
Order by	Specifies the data's order within each group.
Limit	Used to constrain the number of rows returned

SELECT predicate

- **Predicate**

  ALL | *

- Retrieve all data for Staff

```
SELECT *
FROM Staff;
```

- Find names and DoB of all staff

```
SELECT StaffName, DateOfBirth
FROM Staff;
```

Staff table

StaffID	StaffName	DateOfBirth	Salary
1	Buffy Winters	1987-09-15	27000.00
2	Teddy Bear	1983-12-03	87125.02
3	John Smith	1972-09-20	25000.00
4	Jane Doe	1969-01-25	55000.00
5	Jacek Jones	1984-10-19	35000.00
6	Mohammad Awrangjeb	1977-11-21	35000.00
7	Rupam Deb	1980-10-21	55000.00
8	Md Polash	1981-11-25	38000.00
9	Teddy Bear	1983-12-03	87125.02
10	Fred Smith	1956-06-30	25125.02

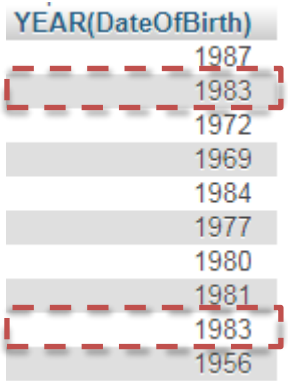
StaffName	DateOfBirth
Buffy Winters	1987-09-15
Teddy Bear	1983-12-03
John Smith	1972-09-20
Jane Doe	1969-01-25
Jacek Jones	1984-10-19
Mohammad Awrangjeb	1977-11-21
Rupam Deb	1980-10-21
Md Polash	1981-11-25
Teddy Bear	1983-12-03
Fred Smith	1956-06-30

SELECT predicate

- **Predicate**
  DISTINCT | DISTINCTROW

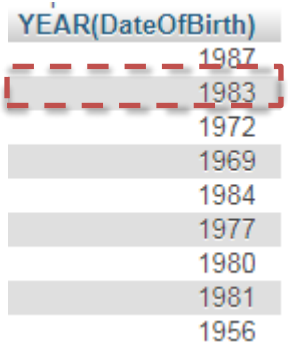
- Find all years from DoB of staff

```
SELECT YEAR(DateOfBirth)
FROM Staff;
```



- Retrieve distinct years from DoB of staff

```
SELECT DISTINCT YEAR(DateOfBirth)
FROM Staff;
```



- YEAR(), MONTH() and DAY() find respective values from a DATE data

Alias

- Can include aliases for
  - Fields and/or
  - Table names

- Fields only

```
SELECT YEAR(DateOfBirth) AS 'Years of birth for staff'
FROM Staff;
```

Years of birth for staff
1987
1983
1972
1969
1984
1977
1980
1981
1983
1956

- Fields and tables

```
SELECT YEAR(S.DateOfBirth) AS 'Years of birth for staff'
FROM Staff as S;
```

Years of birth for staff
1987
1983
1972
1969
1984
1977
1980
1981
1983
1956

- Useful when you **use the same table more than once in a query**. We will learn more later.

ORDER BY clause

- Sort the output table using ORDER BY clause
- Show staff names and their date of birth in ascending order of their age

```
SELECT StaffName, DateOfBirth
FROM Staff
Order by DateOfBirth;
```

StaffName	DateOfBirth
Fred Smith	1956-06-30
Jane Doe	1969-01-25
John Smith	1972-09-20
Mohammad Awrangjeb	1977-11-21
Rupam Deb	1980-10-21
Md Polash	1981-11-25
Teddy Bear	1983-12-03
Teddy Bear	1983-12-03
Jacek Jones	1984-10-19
Buffy Winters	1987-09-15

- So, by default order by is ascending order

```
SELECT StaffName, DateOfBirth
FROM Staff
Order by DateOfBirth ASC;
```

- Show staff names and their date of birth in descending order of their age

```
SELECT StaffName, DateOfBirth
FROM Staff
Order by DateOfBirth DESC;
```

StaffName	DateOfBirth
Buffy Winters	1987-09-15
Jacek Jones	1984-10-19
Teddy Bear	1983-12-03
Teddy Bear	1983-12-03
Md Polash	1981-11-25
Rupam Deb	1980-10-21
Mohammad Awrangjeb	1977-11-21
John Smith	1972-09-20
Jane Doe	1969-01-25
Fred Smith	1956-06-30

LIMIT clause

- Limit the number of rows that you want to show
  - Syntax: LIMIT m,n
    - m = rows to skip
    - n = rows to show after skipping m rows

- Show the youngest staff's name and DoB

```
SELECT StaffName, DateOfBirth
FROM Staff
Order by DateOfBirth DESC
Limit 0,1;
```

StaffName	DateOfBirth
Buffy Winters	1987-09-15

- Find the department that has the third largest budget.

```
SELECT DepartmentID, DepartmentName, Budget
FROM Department
ORDER BY Budget DESC
LIMIT 2,1;
```

Department table

DepartmentID	DepartmentName	Budget	ManagerID
1	Sales	5005000	2
2	Marketing	509000	1
3	Finance	650000	5
4	Accounting	360000	3
5	Human Resource	550000	7

DepartmentID	DepartmentName	Budget
5	Human Resource	550000

Thank you