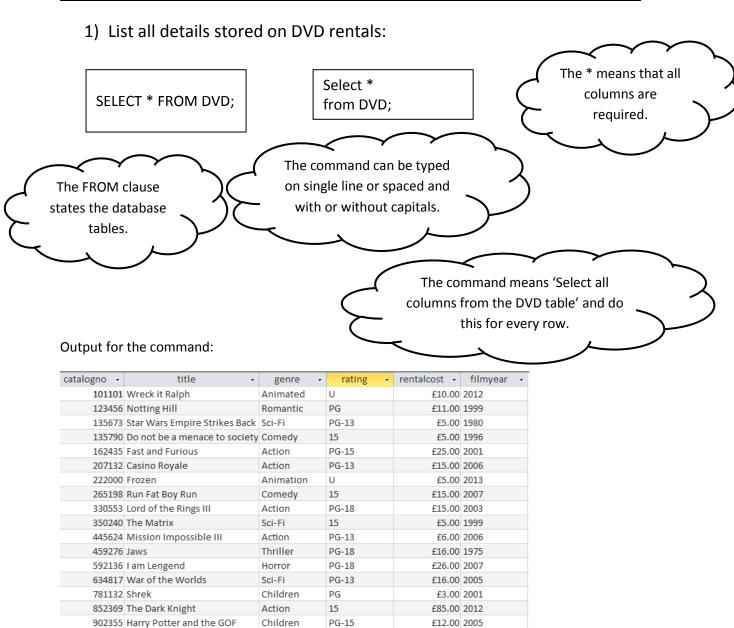**Access Query design using SQL – the SELECT statement – projection and distinct**

The following worksheet will take you through:

- The SELECT statement syntax for retrieving and displaying data from one or more tables.

Simplest SELECT statement retrieves all columns from every row of a table:

1) List all details stored on DVD rentals:

SELECT * FROM DVD;

Select *
from DVD;

The * means that all columns are required.

The FROM clause states the database tables.

The command can be typed on single line or spaced and with or without capitals.

The command means 'Select all columns from the DVD table' and do this for every row.

Output for the command:

catalogno	title	genre	rating	rentalcost	filmyear
101101	Wreck it Ralph	Animated	U	£10.00	2012
123456	Notting Hill	Romantic	PG	£11.00	1999
135673	Star Wars Empire Strikes Back	Sci-Fi	PG-13	£5.00	1980
135790	Do not be a menace to society	Comedy	15	£5.00	1996
162435	Fast and Furious	Action	PG-15	£25.00	2001
207132	Casino Royale	Action	PG-13	£15.00	2006
222000	Frozen	Animation	U	£5.00	2013
265198	Run Fat Boy Run	Comedy	15	£15.00	2007
330553	Lord of the Rings III	Action	PG-18	£15.00	2003
350240	The Matrix	Sci-Fi	15	£5.00	1999
445624	Mission Impossible III	Action	PG-13	£6.00	2006
459276	Jaws	Thriller	PG-18	£16.00	1975
592136	I am Lengend	Horror	PG-18	£26.00	2007
634817	War of the Worlds	Sci-Fi	PG-13	£16.00	2005
781132	Shrek	Children	PG	£3.00	2001
852369	The Dark Knight	Action	15	£85.00	2012
902355	Harry Potter and the GOF	Children	PG-15	£12.00	2005

Projection – retrieving a subset of the columns in the table

- A projection is a query where a number of specific columns are required but not all the columns.

2) List all the DVD rentals by catalogue number and title and the year that the film was made.

All columns required must be explicitly stated.

SELECT catalogNo, title, filmyear

FROM DVD;

Instead of listing all columns from the DVD table only columns catalogNo, title and filmyear are required.

In this query the column expressions are simply the column names, but arithmetic and functions can be stated.

Output for the command:

catalogNo	title	filmyear
101101	Wreck it Ralph	2012
123456	Notting Hill	1999
135673	Star Wars Empire Strikes Back	1980
135790	Do not be a menace to society	1996
162435	Fast and Furious	2001
207132	Casino Royale	2006
222000	Frozen	2013
265198	Run Fat Boy Run	2007
330553	Lord of the Rings III	2003
350240	The Matrix	1999
445624	Mission Impossible III	2006
459276	Jaws	1975
592136	I am Lengend	2007
634817	War of the Worlds	2005
781132	Shrek	2001
852369	The Dark Knight	2012
902355	Harry Potter and the GOF	2005

DISTINCT - retrieving a subset of the columns in the table with no duplicates

- A DISTINCT query prevents duplicate rows appearing in the output as a result of a Projection query.

3) List all film genres from the DVD table

```
SELECT DISTINCT genre
FROM DVD
```

Using DISTINCT clause removes duplicate rows.

Refers to complete column list.

Output for the command:

genre
Action
Animated
Children
Comedy
Horror
Romantic
Sci-Fi
Thriller

WHERE expressions – specify a subset of rows that will be delivered in the output

- The test is applied to each row of the table in turn and if the condition in the WHERE CLAUSE is true for the row, then the row will be output.
- All operators work with characters, date and numeric data types.

4) List rentals that are over £20.00

```
SELECT DVD.catalogNo, DVD.title, DVD.genre, DVD.rentalcost
FROM DVD
WHERE rentalcost > 20
```

DVD. explicitly states the table and used when there is more than one table in the database.

The WHERE clause contains a condition 'rental is greater than £20.00'.

Operators:
= equals
< is less than
>is greater than
<= is less than or equal to (i.e. not greater than
>= is greater than or equal to (i.e. not less than)
<> is not equal to

The columns output are catalogNo, title, genre and rentalcost

5) List rental values between £2.00 and £10.00

```
SELECT catalogNo, title, rentalcost
FROM DVD
WHERE rentalcost BETWEEN 2.00 and
10.00;
```

6) List rental value greater than £2.00, but less than £10.00

```
SELECT catalogNo, title,
rentalcost
FROM DVD
WHERE rentalcost > 2.00 AND
rentalcost < 10.00;
```

7) List all DVDs which are either Sci-Fi or Children genres.

```
SELECT catalogNo, title,
genres
FROM DVD
WHERE genre="Sci-Fi" OR
genre="Children"
```

And order the results by title in descending order:

```
SELECT catalogNo, title, genres
FROM DVD
WHERE genre="Sci-Fi" OR
genre="Children"
ORDER BY title DESC
```

And order the results by title in ascending order:

```
SELECT catalogNo, title, genres
FROM DVD
WHERE genre="Sci-Fi" OR
genre="Children"
ORDER BY title ASC
```

LIKE expressions – Fuzzy matching

- The LIKE operator works with character fields and allows "fuzzy matching".
- The query contains an approximate spelling of the required column and all character matches are retrieved

```
SELECT *
FROM DVD
WHERE rating like 'PG';
```

```
SELECT *
FROM DVD
WHERE rating like 'PG*';
```

```
SELECT *
FROM DVD
WHERE rating like 'U';
```

```
Why will this not produce any output?
SELECT *
FROM DVD
WHERE rating like '18';
```