# 4 Advanced Selection Queries

# 4.1 Ordering results

#### **ORDER BY**

In a table, the order of the records (rows) cannot be guaranteed – in fact as records are added (to the bottom of the table) and deleted (from the centre of the table) the order becomes even less predictable.

To view a set of ordered records SQL provides the ORDER BY keywords – to see all the records in the PROPERTY table ordered by propertyno use:

```
SELECT *
FROM property
ORDER BY propertyno;
```

A sort section in a SELECT statement is of the form:

```
ORDER BY object [DESC [object [DESC]...
```

Where object can be any valid select list object except \*.

Numeric values will be shown lowest value first, date values will be shown earliest and character values will be sorted alphabetically. If the DESC keyword is used, sort order will be reversed e.g. highest value first. Note that empty NULL values will always be shown first. The opposite is ASC for ascending. The ORDER BY clause is the last statement of the SELECT command.

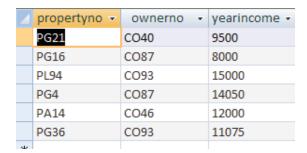
#### **ORDER BY examples**

**Activity**: In the SQL view of Microsoft Access type in these example queries and verify that they produce similar results.

#### **Examples**

Display property no, owner no and year income, ordered by year income

```
SELECT propertyno, ownerno, yearincome FROM property
ORDER BY yearincome;
```



Note that the order by clause can refer to a column not required in the output selection – hence display propertyno and ownerno, ordered by yearincome:

SELECT propertyno,ownerno FROM property
ORDER BY yearincome;

4	propertyno 🔻	ownerno 🕶
	PG21	CO40
	PG16	CO87
	PL94	CO93
	PG4	CO87
	PA14	CO46
	PG36	CO93
w		



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Display all the property information ordered by property number and rent, with rent in descending order.

SELECT \*
FROM property
ORDER by propertyno, rent DESC;

	propertyno 🔻	street +	country -	type 🕶	rooms +	rent +	yearincome +	ownerno 🕶
	PA14	16 Holhead	Barbados	Villa	6	500	12000	CO46
	PG16	5 Novar Dr	Antigua	Apartment	2	400	8000	CO87
	PG21	18 Dale Rd	St Kitts	Apartment	3	450	9500	CO40
	PG36	2 Manor Rd	Barbados	Studio	1	475	11075	CO93
	PG4	6 Lawrence St	Barbados	Villa	4	525	14050	CO87
	PL94	6 Argyll St	Barbados	Villa	4	550	15000	CO93
w.								

Note the use of the comma inside the ORDER BY clause.

Display property no, country, rooms and monthly rental income - order by propertyno and country (the monthlyrent column is created by you)

SELECT propertyno, country, rooms, yearincome/12 AS monthlyrent FROM property
ORDER BY propertyno, country;

A proportion	an untra	**************************************	m on the lune on t
propertyno 🔻	country -	rooms +	monthlyrent -
PA14	Barbados	6	1000
PG16	Antigua	2	666.66666666667
PG21	St Kitts	3	791.666666666667
PG36	Barbados	1	922.916666666667
PG4	Barbados	4	1170.83333333333
PL94	Barbados	4	1250

# 4.2 Selecting Specific Rows

## The Selection Operation

**Projection** can be visualised as providing specific columns in a table, Selection can be used to get specific rows.

A **Selection** operation uses a condition to specify the rows that will be displayed in the resulting table.

**Example:** Show every row in PROPERTY where Rent is greater than 400.

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```
object operator object
```

Where the object can be any valid SELECT object except \* or an aggregate function (discussed later). Operator can be a Boolean operator or a special SQL operator:

#### **Boolean Operators**

=	Equal to
!= or <>	Not equal to
<	Less than
>	Greater than
<=	Less than or equal to
>=	Greater than or equal to

#### **Special operators**

```
BETWEEN lowest AND highest (values inclusive)
IN (value, value, ...)
LIKE "FUZZY STRING"
IS NULL
NOT can negate any of the above
```

## SELECTION examples using the WHERE clause

Activity: Type in these example queries and verify that they produce similar results

#### **Examples**

## Display the property information for Villas

```
SELECT *
FROM property
WHERE type="Villa";
```



Note that the text part of the condition must be enclosed in double quotes.

#### Display the properties that owner number CO87 has

SELECT \*

FROM property

WHERE ownerno="CO87";

4	propertyno 🕶	street +	country -	type -	rooms +	rent +	yearincome 🕶	ownerno 🕶
	PG4	6 Lawrence St	Barbados	Villa	4	525	14050	CO87
	PG16	5 Novar Dr	Antigua	Apartment	2	400	8000	CO87
*								

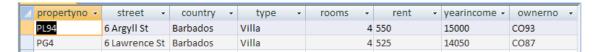
## Display the properties that are Villas with a rental figure over £500

SELECT \*

FROM property

WHERE type="Villa" and rent>500;

Note how number values do not have quotes (as long as the field is defined as Number).





#### Display the details of all bookings on property PG4 where a comment has not been supplied

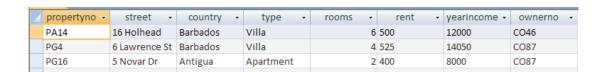
SELECT \*
FROM booking
WHERE propertyno="PG4" AND comment IS NULL;



Note – null means empty, not null would mean bring up all the people who have values that are not blank

#### Display the properties that have the owner number CO46 or CO87

SELECT \*
FROM property
WHERE ownerno in ("CO46", "CO87");



This could be done with the condition ownerno="CO46" or ownerno="CO87".

You could use the order by clause to put in the above ownerno descending order:

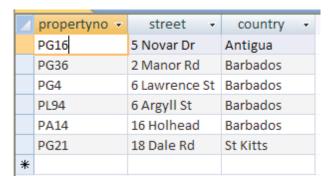
```
SELECT *
FROM property
WHERE ownerno in ("CO46", "CO87")
ORDER by ownerno DESC;
```

## 4.3 Exercises – Order As and Selection

In the following exercises, a query must be specified to produce the suggested result. There are spaces for you to write SQL query statements. Use the AS command to get correct column headings in SQL.

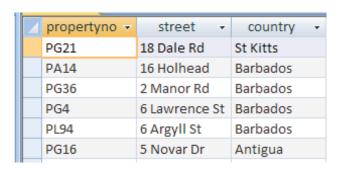
1. Display the property number, street and country information ordered by country.

## **SQL**:



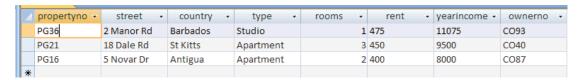
2. Display the property number, street and country information ordered by country (descending) and property number (ascending).

## **SQL**:



3. Display the property information for properties that have less than 4 rooms.

## SQL:



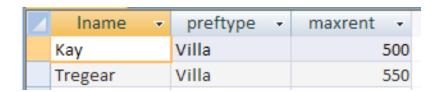
4. Display all the properties with 4 rooms and rent of over £540.

## **SQL**:



5. Display a list of client last names, preference type and the maximum rent figure with a preference of Villas ordered by their maximum rent figure ascending.

## **SQL**:





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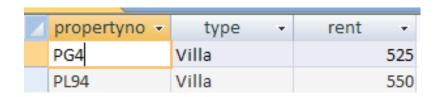
6. Show a list of clients who have made a comment ordered by property number descending.

## **SQL**:

4	clientno 🔻	propertyno 🕶	bookingdate 🕶	comment +
	CR76	PG4	09/07/2007	special diet
	CR62	PA14	03/09/2007	allergies
	CR56	PA14	16/07/2007	Non smoking required

<sup>7.</sup> Display the property numbers, type, rent and owner number of those properties who have a yearly income figure more than £11,000 and have 4 rooms, ordered by property number and type ascending.

#### **SQL**:



# 4.4 Summary

The purpose of the SELECT statement in SQL is to retrieve data from one or more tables and display the result in a required format. It is possible to select specific records from a database according to a particular condition. Also, one may use ORDER BY to sort records after they have been selected. The general form for the complete SELECT statement is given below:

```
SELECT [DISTINCT | ALL] {*| column [AS new_name]] [, ...]}
FROM TableName [alias] [,...]
[WHERE conditional statement]
[GROUP BY column_list] [HAVING condition]
[ORDER BY column list]
```

ORDER BY determines the order of the data retrieval output. The order of the clauses in a SELECT statement cannot be changed, although some of the clauses are optional (enclosed in [] in the above syntax).