

**Advanced Higher  
Computing Science**



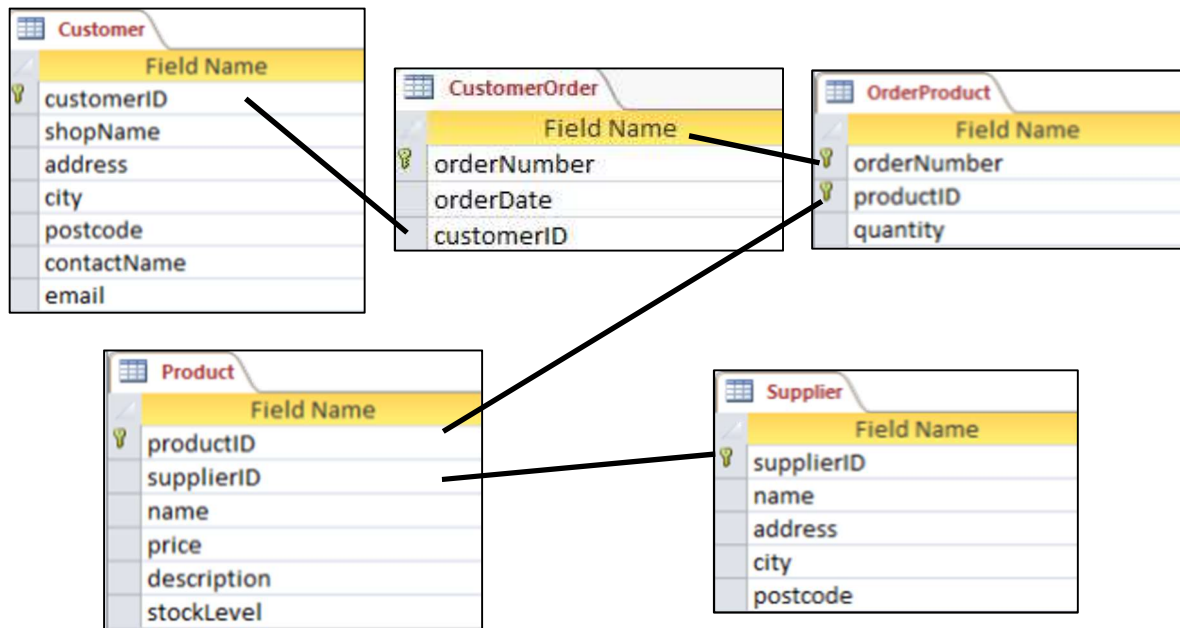
**Database Development**

**SQL Exercises**

Name: \_\_\_\_\_

## Exercise 1: Higher Revision

Use the **Product Supplier** Database. This database has five tables, Customer, CustomerOrder, OrderProduct, Product and Supplier.



Create SQL queries to display the required details.

1. List the name, address and postcode all suppliers with a name that begins with the letter 'D'.
2. List the customerID, shop name and address of all customers who have a shop name that contains the pattern 'oy'. List these customers in alphabetical order of shop name.
3. List the name, price and description of any product with the letters 'i' and 'h' (separated by exactly 2 other letters) in its name. Arrange these product details so that the highest price is listed first; products with the same price should be arranged alphabetically.
4. List the customerID, shop name and city of any customer with the letter 'u' as the second letter of its shop name. Only customers based in a city that starts with the letter 'M' should be listed.

## Exercise 2: Higher Revision

Continue to use the **Product Supplier** Database from Exercise 1.

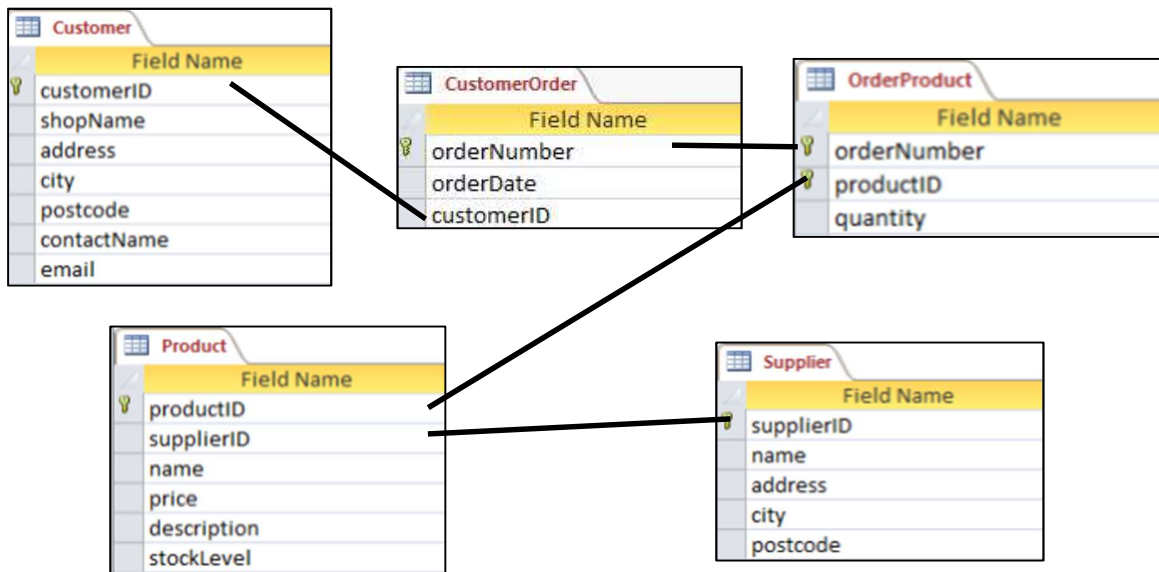
Create SQL queries to display the required details. An alias should be used to display a meaningful heading for each computed field.

1. List the name of each product included in order 3 with its price and the quantity ordered. The order number and total cost of each item should be shown.
2. List all of the products supplied by the supplier called 'Fun and Games'. The listing should show the name of each product together with its price and discounted price (Fun and Games plans to offer a seasonal discount of 10% on all of its products).
3. List each of the products included in order 3 with its productID and quantity ordered. The query should show the increased quantity should the customer increase the quantity of all 'bean bag' products in the order by 20.
4. The shop called 'The Toy Store' wants to increase the number of each type of bean bag in its order by 25.

Use a query to list the name of the shop with the name of its contact person, the original quantity, price, description and the updated quantity of all bean bags in the order.

### Exercise 3

Continue to use the **Product Supplier** Database from Exercise 1.



Use SQL queries to display each set of required details.

1. List the name of each supplier together with the average price of the products that they supply (round the average to 2 decimal places). Only suppliers whose average product price is more than £5 should be shown.
2. List the name of each shop together with the largest and the average number of products ordered by the shop (round the average to 1 decimal place) where the largest quantity is under 200.
3. List the name of each shop that has placed more than 1 order also showing the number of orders that the shop has placed. The shop with the largest number of orders should be listed first; shops with the same number of orders should be listed alphabetically.
4. List each order number together with the number of different products ordered in each order for orders containing 3 or more different products.
5. List the name of each supplier together with the total value of the products that they supply. Only suppliers whose total product value is £20 or less should be shown. These details should be listed from largest to smallest value.
6. List the name of each product that has been ordered with the combined total quantity of the product that has been ordered for orders totalling £100 or more. The products should be listed from largest combined total to smallest; product with the same combined total should be listed alphabetically by product name.
7. List the name of each shop and the total number of bears that have been ordered by the shop for shops that have ordered more than 1 bear. The shop that has ordered the smallest number of bears should be listed first.

## Exercise 4

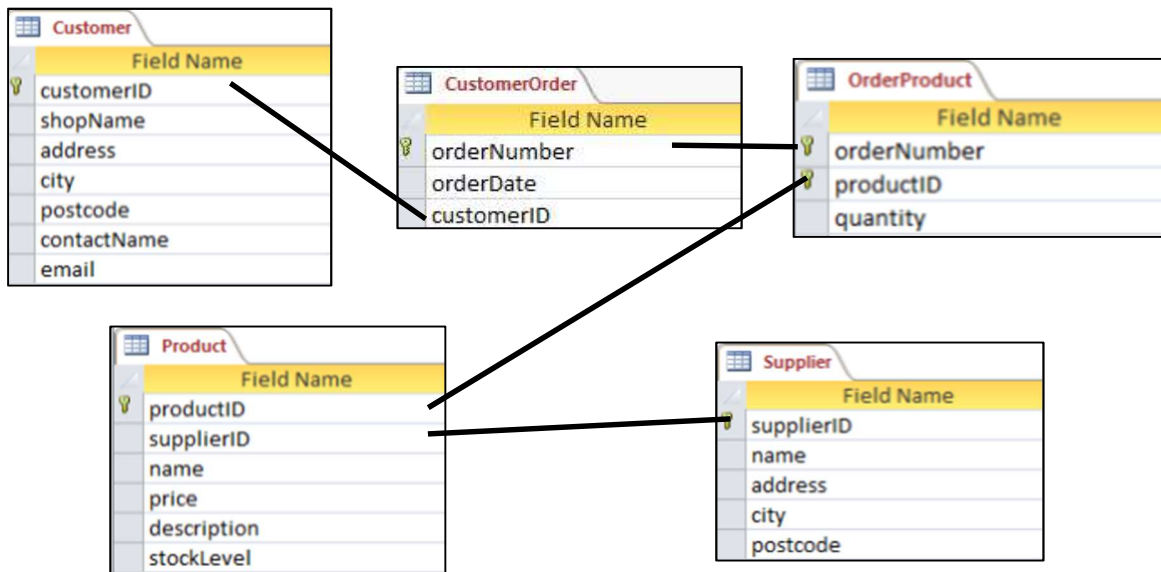
Continue to use the **Product Supplier** Database from Exercise 1.

Use SQL **subqueries** to display each set of required details.

1. Show the name of shops for all customers who placed orders after 28 February 2018.
2. Show the name of all products provided by suppliers in Ayr, London and Paris.
3. Show the name and price of all products ordered 10 times within a single order.
4. Show the full details of all products that costs more than any product with the word inch in its name.
5. Show the full details of all products except the highest priced product.
6. Show the full details of all products that did not have an order placed for 250 items.
7. Show the full details of all customers that have never ordered a Raggedy Ann doll.

## Exercise 5

Continue to use the **Product Supplier** Database from Exercise 1.



1. Show the name of all products with a selling price between £5 and £10.
2. Show the name of all customers who placed an order in March.
3. Show the name of suppliers who live in a post code area in the second half of the alphabet.

## Exercise 6

Continue to use the **Product Supplier** Database from Exercise 1

1. Show the name and address of shops called Kids Place, The Toy Store and Village Toys
2. Display the product name and quantity ordered for all products where 10 or 20 were ordered at once.
3. Find the shop name of customers who have ordered either a Bird bean bag toy, a King Doll or an 8 inch teddy bear. Each shop should only be displayed once.

## Answers

### Exercise 1: Wildcard Revision (Higher)

1

```
SELECT name, address, postcode
FROM Supplier
WHERE name LIKE "D%";
```

name	address	postcode
Doll House Inc.	555 High Street	DD1 7DD

2

```
SELECT customerID, shopName, address
FROM customer
WHERE shopName LIKE "%oy%"
ORDER BY shopName ASC;
```

customerID	shopName	address
1000000005	The Toy Store	4545 53rd Street
1000000001	Village Toys	200 Maple Lane

3.

```
SELECT name, price, description
FROM Product
WHERE name LIKE "%i_h%"
ORDER BY price DESC, name ASC;
```

name	price	description
18 inch teddy bear	11.99	18 inch teddy bear, comes with cap and jacket
12 inch teddy bear	8.99	12 inch teddy bear, comes with cap and jacket
8 inch teddy bear	5.99	8 inch teddy bear, comes with cap and jacket

4

```
SELECT customerID, shopName, city
FROM customer
WHERE shopName LIKE "_u%"
AND city LIKE "M%";
```

customerID	shopName	city
1000000003	Fun4All	Montrose

## Exercise 2: Other Revision (Higher)

1

```
SELECT CustomerOrder.orderNumber, name, quantity, price,
(quantity*price) AS Cost
FROM CustomerOrder, OrderProduct, Product
WHERE CustomerOrder.orderNumber=OrderProduct.orderNumber
AND OrderProduct.productID=Product.productID
AND CustomerOrder.orderNumber=3;
```

orderNumber	name	quantity	price	Cost
3	Fish bean bag toy	100	3.49	349.00
3	Bird bean bag toy	100	3.49	349.00
3	Rabbit bean bag toy	100	3.49	349.00
3	18 inch teddy bear	50	11.99	599.50
3	Raggedy Ann	50	4.99	249.50

2

```
SELECT Supplier.name, Product.name, price, round(price*0.9,2) AS
`Discounted Price`
FROM Supplier, Product
WHERE Supplier.supplierID=Product.supplierID
AND Supplier.name="Fun and Games";
```

name	name	price	Discounted Price
Fun and Games	King doll	9.49	8.54
Fun and Games	Queen doll	9.49	8.54

### 3

```
SELECT CustomerOrder.orderNumber,name, Product.productID, quantity,
quantity+20 AS `Increased Quantity`
FROM CustomerOrder, OrderProduct, Product
WHERE CustomerOrder.orderNumber=OrderProduct.orderNumber
AND OrderProduct.productID=Product.productID
AND CustomerOrder.orderNumber=3
AND name LIKE "%bean bag%";
```

orderNumber	name	productID	quantity	Increased Quantity
3	Fish bean bag toy	BNBG01	100	120
3	Bird bean bag toy	BNBG02	100	120
3	Rabbit bean bag toy	BNBG03	100	120

### 4

```
SELECT shopName, contactName, quantity, price, description,
quantity+25 AS `Updated Quantity`
FROM Customer, CustomerOrder, OrderProduct, Product
WHERE Customer.customerID=CustomerOrder.customerID
AND CustomerOrder.orderNumber=OrderProduct.orderNumber
AND OrderProduct.productID=Product.productID
AND shopName="The Toy Store"
AND description like "%bean bag%";
```

shopName	contactName	quantity	price	description	Updated Quantity
The Toy Store	Kim Howard	10	3.49	Fish bean bag toy, complete with bean bag worms wi...	35
The Toy Store	Kim Howard	10	3.49	Bird bean bag toy, eggs are not included	35
The Toy Store	Kim Howard	10	3.49	Rabbit bean bag toy, comes with bean bag carrots	35

### Exercise 3: HAVING

1. 

```
SELECT Supplier.name, round(AVG(price),2) AS `Average Product Price`
FROM Supplier, Product
WHERE Supplier.supplierID=Product.supplierID
GROUP BY Supplier.name
HAVING AVG(price) > 5;
```

name	Average Product Price
Bears R Us	8.99
Fun and Games	9.49

2. 

```
SELECT customer.shopname, MAX(orderproduct.quantity) as `Largest`, ROUND(AVG(orderproduct.quantity),1) AS `Average`
FROM customer, customerorder, orderproduct
WHERE orderproduct.orderNumber = customerorder.orderNumber AND
customer.customerID=customerorder.customerID
GROUP BY customer.shopName
HAVING MAX(orderproduct.quantity) < 200;
```

shopname	Largest	Average
Fun4All	100	55.0
The Toy Store	10	8.0

3. 

```
SELECT shopName, COUNT(*) AS `Number of Ordered Placed`
FROM Customer, CustomerOrder
WHERE Customer.customerID=CustomerOrder.customerID
GROUP BY shopName
HAVING COUNT(*) >1
ORDER BY COUNT(*) DESC , shopName
```

shopName	Number of Ordered Placed
Fun4All	2
Village Toys	2

4. 

```
SELECT orderNumber, COUNT(*) AS `Number of Different Products in the Order`
FROM OrderProduct, Product
WHERE OrderProduct.productID=Product.productID
GROUP BY orderNumber
HAVING COUNT(*) >=3;
```

orderNumber	Number of Different Products in the Order
2	3
3	5
4	5
5	3

5. SELECT Supplier.name, SUM(price) AS `Total Value`  
 FROM Supplier, Product  
 WHERE Supplier.supplierID=Product.supplierID  
 GROUP BY Supplier.name  
 HAVING SUM(price) <=20  
 ORDER BY SUM(price) ASC;

name	Total Value
Doll House Inc.	15.46
Fun and Games	18.98

6. SELECT name, SUM(quantity) AS `Total Quantity Ordered`  
 FROM OrderProduct, Product  
 WHERE OrderProduct.productID=Product.productID  
 GROUP BY name  
 HAVING SUM(quantity) >= 100  
 ORDER BY SUM(quantity) DESC, name ASC;

name	Total Quantity Ordered
Bird bean bag toy	360
Fish bean bag toy	360
Rabbit bean bag toy	360
18 inch teddy bear	165
8 inch teddy bear	120

7. SELECT shopName, COUNT(\*) AS `Number of Bears Ordered`  
 FROM Customer, CustomerOrder, OrderProduct, Product  
 WHERE Customer.customerID=CustomerOrder.customerID  
 AND CustomerOrder.orderNumber=OrderProduct.orderNumber  
 AND OrderProduct.productID=Product.productID  
 AND name LIKE "%bear%"  
 GROUP BY shopName  
 HAVING COUNT(\*) >1  
 ORDER BY COUNT(\*) ;

shopName	Number of Bears Ordered
Village Toys	2
Fun4All	4

## Exercise 4: Subqueries (ANY/EXISTS)

1.

```
SELECT customer.shopName
FROM customer
WHERE customerid = ANY (SELECT customerID FROM customerOrder WHERE
orderDate > "2018-02-28")
```

shopName
Village Toys
Fun4All
The Toy Store

2.

```
SELECT product.name
FROM product
WHERE supplierid = ANY (SELECT supplierID FROM supplier WHERE city
IN ("London", "Paris", "Ayr"))
```

name
King doll
Queen doll

3.

```
SELECT product.name, product.price
FROM product
WHERE productID = ANY (SELECT orderproduct.productID FROM
orderproduct WHERE orderproduct.quantity =10)
```

name	price
Fish bean bag toy	3.49
Bird bean bag toy	3.49
Rabbit bean bag toy	3.49
12 inch teddy bear	8.99
18 inch teddy bear	11.99

4.

```
SELECT *  
FROM product  
WHERE price > ANY(SELECT price FROM product WHERE name like  
"%inch%")
```

productID	supplierID	name	price	description
BR02	BRS01	12 inch teddy bear	8.99	12 inch teddy bear, comes with cap and jacket
BR03	BRS01	18 inch teddy bear	11.99	18 inch teddy bear, comes with cap and jacket
RYL01	FNG01	King doll	9.49	12 inch king doll with royal garments and crown
RYL02	FNG01	Queen doll	9.49	12 inch queen doll with royal garments and crown

5.

```
SELECT *  
FROM Product  
WHERE price < (SELECT MAX(price) FROM product)
```

productID	supplierID	name	price	description
BNBG01	DLL01	Fish bean bag toy	3.49	Fish bean bag toy, complete with bean bag worms wi...
BNBG02	DLL01	Bird bean bag toy	3.49	Bird bean bag toy, eggs are not included
BNBG03	DLL01	Rabbit bean bag toy	3.49	Rabbit bean bag toy, comes with bean bag carrots
BR01	BRS01	8 inch teddy bear	5.99	8 inch teddy bear, comes with cap and jacket
BR02	BRS01	12 inch teddy bear	8.99	12 inch teddy bear, comes with cap and jacket
RGAN01	DLL01	Raggedy Ann	4.99	18 inch Raggedy Ann doll
RYL01	FNG01	King doll	9.49	12 inch king doll with royal garments and crown
RYL02	FNG01	Queen doll	9.49	12 inch queen doll with royal garments and crown

6.

```
SELECT *  
FROM product  
WHERE NOT EXISTS (SELECT productid FROM orderproduct  
WHERE product.productid = orderproduct.productid  
AND quantity =250)
```

productID	supplierID	name	price	description
BR01	BRS01	8 inch teddy bear	5.99	8 inch teddy bear, comes with cap and jacket
BR02	BRS01	12 inch teddy bear	8.99	12 inch teddy bear, comes with cap and jacket
BR03	BRS01	18 inch teddy bear	11.99	18 inch teddy bear, comes with cap and jacket
RGAN01	DLL01	Raggedy Ann	4.99	18 inch Raggedy Ann doll
RYL01	FNG01	King doll	9.49	12 inch king doll with royal garments and crown
RYL02	FNG01	Queen doll	9.49	12 inch queen doll with royal garments and crown

7.

```
SELECT *  
FROM customer  
WHERE NOT customerID =ANY (SELECT customer.customerID  
FROM customer, customerOrder, OrderProduct, product  
WHERE customer.customerID = customerOrder.customerID  
AND customerorder.ordernumber =  
orderproduct.ordernumber and orderproduct.productid =  
product.productid AND product.name ="Raggedy Ann")
```

customerID	shopName	address	city	postcode	contactName	email
1000000001	Village Toys	200 Maple Lane	Dundee	DD21 1YX	John Smith	sales@vill
1000000002	Kids Place	333 South Lake Drive	Clydebank	G81 1KL	Michelle Green	
1000000003	Fun4All	1 Sunny Place	Montrose	DD10 9ZW	Jim Jones	jjones@fun

## Exercise 5: BETWEEN

1.

```
SELECT product.name
FROM product
WHERE product.price BETWEEN 5 AND 10
```

name
8 inch teddy bear
12 inch teddy bear
King doll
Queen doll

2.

```
SELECT customer.shopname
FROM customer, customerorder
WHERE customerorder.customerid = customer.customerid
AND customerorder.orderdate BETWEEN "2018-03-01" AND "2018-03-31"
```

shopname
The Toy Store

3.

```
SELECT supplier.name
FROM supplier
WHERE supplier.postcode BETWEEN "M" AND "Z"
```

name
Bears R Us
Fun and Games

## Exercise 6: IN

1

```
SELECT shopName, address
FROM customer
WHERE shopName IN("Kids Place", "The Toy Store", "Village Toys")
```

shopName	address
Village Toys	200 Maple Lane
Kids Place	333 South Lake Drive
The Toy Store	4545 53rd Street

2

```
SELECT name, quantity
FROM product, orderproduct
WHERE product.productID = orderproduct.productID
AND quantity IN (10,20)
```

name	quantity
Fish bean bag toy	10
Bird bean bag toy	10
Rabbit bean bag toy	10
8 inch teddy bear	20
12 inch teddy bear	10
18 inch teddy bear	10

3

```
SELECT Customer.shopName
FROM Customer, CustomerOrder, OrderProduct, Product
WHERE Customer.customerID = CustomerOrder.customerid AND
CustomerOrder.orderNumber = OrderProduct.OrderNumber AND
OrderProduct.productid = Product.productid
AND product.name IN("Bird bean bag toy","King Doll", "8 inch teddy
bear")
GROUP BY Customer.shopName
```

shopName
Fun4All
The Toy Store
Village Toys