Higher
Computing Science

Database Design and Development

Implementation

Name:_____

Contents

Computed values with aliases

Arithmetic expressions can be used to compute values as part of a SELECT query. The arithmetic expressions can contain column names, numeric numbers, and arithmetic operators (*, /, -, +, %).

Whenever a value is generated by a query, it is allocated its own column in the query answer table. A computed value is temporary — it only exists within the query. Because of this, computed values are not stored in the database, which eliminates the need to store data that can be computed at run-time.

An **alias** can be used to give any column in an answer table a temporary name. Doing this makes the headings in the answer table more readable. Since it is generated at run-time, an alias only exists for the duration of the query. An alias is listed in the SELECT list by using the AS statement.

For example, the query below will display the name, price, quantity and cost of each product in a specified order:

```
SELECT productName AS ['Product Name'], price, quantity, price*quantity

FROM Product, Order

WHERE Product.productID = [Order].productID AND order# - 123456;
```

Worked Example: Computed Values

Design a query to display the title of each assessment, together with the duration and pass mark. The results should also show the duration and pass mark added together.

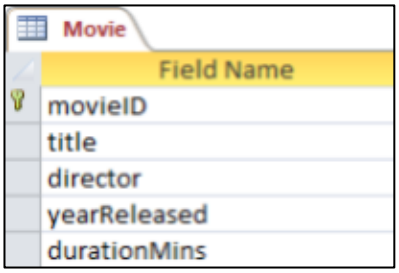
Field(s) and calculation(s)	title, duration, passMark, example total = (duration + passMark)
Table(s) and query	Assessment
Search criteria	
Grouping	
Sort Order	duration + passMark DESC

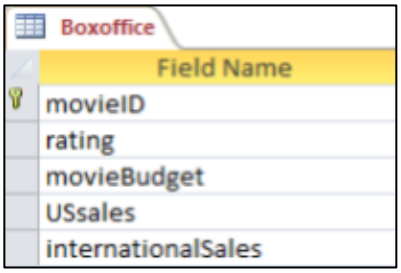
```
SELECT title, duration, passmark, duration+passmark AS
[example total]

FROM assessment

ORDER BY duration+passmark DESC;
```

Practical Task - Computed Values and Aliases

Task 1

Open the file called Movies Database. This database has two tables, Movie and Boxoffice.





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 title of any movie that made a profit. Display the movie with the largest profit first.

   Note: profit = international sales – movie budget

2. List the name of the director of each movie with value of the combined US and international sales. Display the details in alphabetical order of director; movies by the same director should be listed in order of total income, from least to most.

3. List the name of each movie with the year it was released and its rating. The international sales for each movie should be shown in millions. Only movies with international sales over 150 million that have a rating of at least 8 should be included in the list.

4. List the title of each movie together with its duration. The duration should also be shown in separate hours and minutes. For example:

title	Hours	Minutes
Cars	1	57

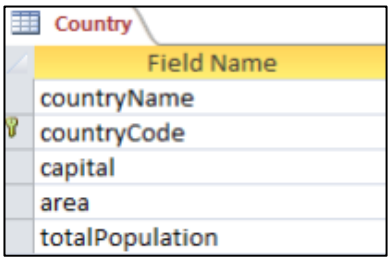
5. The movies should be listed in decreasing order of hours; movies that last for the same number of hours should be listed in decreasing order of minutes.

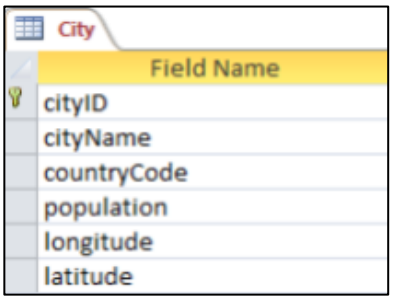
   Note: use the `Int()` or `Integer()` function to round the number of hours *down*

6. List the title of each movie, the name of each director and its rating as a percentage (the maximum rating is 10). The movie with the highest rating should be listed first; movies with the same rating should be listed in alphabetical order of title.

Task 2

Open the file called Countries Database. This database has two tables, City and Country.





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 city in Ethiopia together with the population of the city which should be displayed in thousands.

2. List the name of each country together with its country code and population density (this tells us how many people live in each square kilometre of the country). The only countries listed should be those with a country code that starts with the letter 'M'.

   Note: population density is calculated by dividing the total population of the country by its area

3. List the name of the capital cities that have a population of more than 2,000,000 together with the area of their countries in square miles. The only cities shown should be those in countries that have an area over 500,000 square miles. These details should be listed in alphabetical order of capital city.

   Note: the area of each country is currently in square kilometres. To convert to square miles, multiply by 0.39

4. List each country that is east of the UK with the name of its capital city and the time difference in hours between it and the UK. This first countries listed should be those that have the greatest time difference from the UK; countries with the same time difference should be listed alphabetically.

   Notes: (1) the UK has a longitude of 0 and all countries east of the UK have a longitude > 0
   (2) each degree of longitude is equivalent to 4 minutes of time
   (3) generate the time difference in hours by dividing the longitude by 15

5. List the name of each European capital city north of London with its latitudinal distance north of London. These cities should be listed alphabetically.

   Notes: (1) European cities have a longitude which is less than 35
   (2) cities north of London have a latitude which is greater than 51.5
   (3) each degree of difference in latitude if equivalent to 113 kilometres