SQL

HARD

10+1 bonus questions

DESIGNED BY

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COURSE LENGTH

2 hours

QUESTION 1

Show all of the patients grouped into weight groups and number of patients in each weight group.

Order the list by weight group descending.

QUESTION 1

For example, if they weigh from:

1. 100 to 109 (both inclusive), they are placed in the weight group - 100
2. 110 to 119 (both inclusive), they are placed in the weight group - 110

TABLE

patients

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

APPROACH

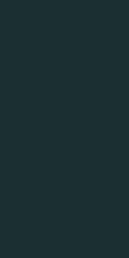
Step 1: FLOOR() to group patients based on given weight group conditions

Step 2: COUNT() to get number of patients in each weight group

Step 3: ORDER BY to sort by weight group in descending order

RESULT

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5



weight_group	no_of_patients
140	6
130	59
120	191

QUESTION 2

Show patient_id, weight, height, isObese.
Display isObese as a boolean i.e. 0 or 1.

Obese is defined as
weight(kg)/(height(m)^2) >= 30.

Given units of:

1. weight is in kg
2. height is in cm

EXAMPLE 1

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65

patient_id: 1
weight: 65 kg
height: 156cm = 156*0.01m = 1.56m

Obese: weight(kg)/(height(m)^2) >= 30
i.e. (65/(1.56)^2) = 26.71

isObese: 0 (not obese)

EXAMPLE 2

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10

patient_id: 5
weight: 10 kg
height: 47cm = 47*0.01m = 0.47m

Obese: weight(kg)/(height(m)^2) >= 30
i.e. (10/(0.47)^2) = 45.27

isObese: 1 (obese)

TABLE

patients

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

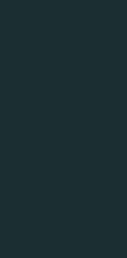
APPROACH

Step 1: POWER() to find square of height in meters

Step 2: CASE to identify if patient is obese or not

RESULT

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5



patient_id	weight	height	isObese
1	65	156	0
2	76	185	0
3	106	194	0
4	104	191	0
5	10	47	1
6	5	43	0

QUESTION 3

Show patient_id, first_name, last_name, and attending doctor's specialty.

Show only the patients who have a diagnosis as 'Epilepsy' and the doctor's first name is 'Lisa'.

Check patients, admissions, and doctors tables for required information.

TABLE

patients

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

admissions

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
1	2018-11-06	2018-11-08	Ovarian Dermoid-Cyct	21
1	2018-09-20	2018-09-20	Ineffective Breathin Pattern R/T Fluid Accumulatio	24
3	2019-01-24	2019-01-29	Cardiac Arrest	2
3	2018-10-21	2018-10-27	Congestive Heart Failure	8
6	2018-06-13	2018-06-15	Asthma Exacerbation	3
6	2018-11-08	2018-11-09	Uterine Fibroid	22

TABLE

doctors

doctor_id	first_name	last_name	specialty
1	Claude	Walls	Internist
2	Joshua	Green	Cardiologist
3	Miriam	Tregre	General Surgeon
4	James	Russo	Obstetrician/Gynecologist
5	Scott	Hill	Gastroenterologist

APPROACH

Step 1: JOIN patients and admissions table based on common column patient_id

Step 2: JOIN admissions and doctors table based on common column doctor_id

APPROACH

Step 3: WHERE to filter diagnosis and doctor's first name based on given conditions

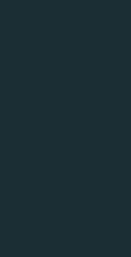
NOTE:
As we don't have a common column between patients and doctors table, we bring in admissions table

RESULT

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
468	Frank	Anderson	M	2009-06-16	Hamilton	ON	Penicillin	137	43

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
468	2018-10-23	2018-10-28	Epilepsy	21

doctor_id	first_name	last_name	specialty
21	Lisa	Cuddy	Obstetrician/Gynecologist



patient_id	first_name	last_name	specialty
468	Frank	Anderson	Obstetrician/Gynecologist
701	Precious	Ashton	Obstetrician/Gynecologist

QUESTION 4

All patients who have gone through admissions, can see their medical documents on our site. Those patients are given a temporary password after their first admission.

Show patient_id and temp_password.

QUESTION 4

The temp_password must be the following, in order:

1. patient_id
2. numerical length of patient's last_name
3. year of patient's birth_date

TABLE

patients

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

admissions

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
1	2018-11-06	2018-11-08	Ovarian Dermoid-Cyct	21
1	2018-09-20	2018-09-20	Ineffective Breathin Pattern R/T Fluid Accumulatio	24
3	2019-01-24	2019-01-29	Cardiac Arrest	2
3	2018-10-21	2018-10-27	Congestive Heart Failure	8
6	2018-06-13	2018-06-15	Asthma Exacerbation	3
6	2018-11-08	2018-11-09	Uterine Fibroid	22

APPROACH

Step 1: WHERE to filter only patients who were admitted i.e. patient_id is present in both patients and admissions table

Step 2: subquery to get patient_id from admissions table

APPROACH

Step 3: LEN() to get numerical length of patient's last_name

Step 4: YEAR() to get year from patient's birth_date

Step 4: CONCAT() to concatenate required columns

RESULT

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
1	2018-11-06	2018-11-08	Ovarian Dermoid-Cyct	21
1	2018-09-20	2018-09-20	Ineffective Breathin Pattern R/T Fluid Accumulatio	24
3	2019-01-24	2019-01-29	Cardiac Arrest	2

patient_id	temp_password
1	1101963
3	361957
6	662017

QUESTION 5

Each admission costs $50 for patients without insurance and $10 for patients with insurance. All patients with an even patient_id have insurance.

Give each patient a 'Yes' if they have and 'No' if they don't have insurance. Add up to show admission_total_cost for each has_insurance group.

TABLE

admissions

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
1	2018-11-06	2018-11-08	Ovarian Dermoid-Cyct	21
1	2018-09-20	2018-09-20	Ineffective Breathin Pattern R/T Fluid Accumulatio	24
3	2019-01-24	2019-01-29	Cardiac Arrest	2
3	2018-10-21	2018-10-27	Congestive Heart Failure	8
6	2018-06-13	2018-06-15	Asthma Exacerbation	3
6	2018-11-08	2018-11-09	Uterine Fibroid	22

APPROACH

Step 1: subquery to get has_insurance and admission_cost

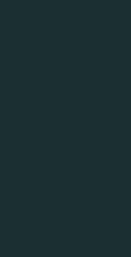
Step 2: CASE to identify if patient has insurance or not

Step 3: CASE to assign corresponding admission_cost

Step 4: SUM() to add up admission_cost based on has_insurance

RESULT

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
1	2018-11-06	2018-11-08	Ovarian Dermoid-Cyct	21
1	2018-09-20	2018-09-20	Ineffective Breathin Pattern R/T Fluid Accumulatio	24
3	2019-01-24	2019-01-29	Cardiac Arrest	2
3	2018-10-21	2018-10-27	Congestive Heart Failure	8
6	2018-06-13	2018-06-15	Asthma Exacerbation	3
6	2018-11-08	2018-11-09	Uterine Fibroid	22



has_insurance	admission_total_cost
No	127800
Yes	25110

QUESTION 6

Show provinces that have more patients identified as 'M' than 'F'

Display only the full province_name

TABLE

patients

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

province_names

province_id	province_name
NT	Northwest Territories
NS	Nova Scotia
NU	Nunavut
ON	Ontario

APPROACH

Step 1: subquery to get number of male and female patients in each province

Step 2: JOIN patients and province_names tables based on common column province_id

APPROACH

Step 3: SUM() to get
number_of_male_patients

Step 4: SUM() to get
number_of_female_patients

Step 5: WHERE to filter only
province_name that have more
male patients than female patients

RESULT

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76

province_id	province_name
NT	Northwest Territories
NS	Nova Scotia

province_name
Alberta
British Columbia
Manitoba
Newfoundland and Labrador
Nova Scotia
Ontario
Saskatchewan

QUESTION 7

We are looking for a specific patient.

QUESTION 7

Pull all columns for the patient who matches all criteria:

- First_name contains an 'r' after first two letters
- Identifies their gender as 'F'
- Born in February, May or December
- Their weight is between 60 and 80 kg
- Their patient_id is an odd number
- They are from the city 'Kingston'

TABLE

patients

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

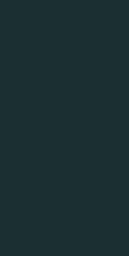
APPROACH

Step 1: WHERE and AND to find the patient who matches all given criteria

Step 2: SELECT * to get all columns from patients table

RESULT

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1838	Domenica	McCall	F	1998-05-15	Hamilton	ON	NULL	145	59
1839	Chris	Cardenas	F	1969-12-02	Kingston	ON	NULL	141	71
1840	Nisha	Donnelly	F	2009-10-22	Dundas	ON	Penicillin	102	40
1841	Claire	Van Buren	F	1994-06-14	Hamilton	ON	Penicillin	157	75
1842	Laura	Rockford	F	1959-05-02	Hamilton	ON	NULL	147	59
1843	Mark	Patil	M	1997-09-02	Hamilton	ON	NULL	187	115



patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1839	Chris	Cardenas	F	1969-12-02	Kingston	ON	NULL	141	71

QUESTION 8

Show percent of patients that have 'M' as their gender

Round the answer to nearest hundredth number and represent in percent form

TABLE

patients

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

APPROACH

Step 1: SUM() to get count of male patients

Step 2: COUNT() to get count of all patients

Step 3: ROUND() to round to nearest hundredth number

Step 4: CONCAT() to represent the number in percent form

RESULT

patient_id	first_name	last_name	gender	birth_date	city	province_id	allergies	height	weight
1	Donald	Waterfield	M	1963-02-12	Barrie	ON	NULL	156	65
2	Mickey	Baasha	M	1981-05-28	Dundas	ON	Sulfa	185	76
3	Jiji	Sharma	M	1957-09-05	Hamilton	ON	Penicillin	194	106
4	Blair	Diaz	M	1967-01-07	Hamilton	ON	NULL	191	104
5	Charles	Wolfe	M	2017-11-19	Orillia	ON	Penicillin	47	10
6	Sue	Falcon	F	2017-09-30	Ajax	ON	Penicillin	43	5

percentage_of_male_patients
54.48%

QUESTION 9

For each day display total amount of admissions on that date

Display amount changed from previous date

TABLE

admissions

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
1	2018-11-06	2018-11-08	Ovarian Dermoid-Cyct	21
1	2018-09-20	2018-09-20	Ineffective Breathin Pattern R/T Fluid Accumulatio	24
3	2019-01-24	2019-01-29	Cardiac Arrest	2
3	2018-10-21	2018-10-27	Congestive Heart Failure	8
6	2018-06-13	2018-06-15	Asthma Exacerbation	3
6	2018-11-08	2018-11-09	Uterine Fibroid	22

APPROACH

Step 1: subquery to get admissions_on_current_date

Step 2: COUNT() to get admissions_on_current_date

Step 3: LAG() to get admissions on previous date

APPROACH

Step 4: subtract admissions on current and previous date to get change_from_previous_date

RESULT

patient_id	admission_date	discharge_date	diagnosis	attending_doctor_id
1	2018-11-06	2018-11-08	Ovarian Dermoid-Cyct	21
1	2018-09-20	2018-09-20	Ineffective Breathin Pattern R/T Fluid Accumulatio	24
3	2019-01-24	2019-01-29	Cardiac Arrest	2
3	2018-10-21	2018-10-27	Congestive Heart Failure	8
6	2018-06-13	2018-06-15	Asthma Exacerbation	3
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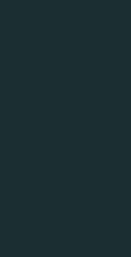

admission_date	admissions_on_current_date	change_from_previous_date
2018-06-06	17	NULL
2018-06-07	9	-8
2018-06-08	9	0
2018-06-09	18	9
2018-06-10	12	-6
2018-06-11	22	10

QUESTION 10

Sort province names in ascending order in such a way that the province 'Ontario' is always on top

TABLE

province_names

province_id	province_name
NT	Northwest Territories
NS	Nova Scotia
NU	Nunavut
ON	Ontario

APPROACH

Step 1: display 'Ontario' on top always

Step 2: get all other province_name except 'Ontario'

Step 3: UNION ALL to combine the outputs

RESULT

province_id	province_name
NT	Northwest Territories
NS	Nova Scotia
NU	Nunavut
ON	Ontario

province_name
Ontario
Alberta
British Columbia
Manitoba
New Brunswick
Newfoundland and Labrador
Northwest Territories

BONUS QUESTION 1

Show the employee's first_name, last_name, a "num_orders" column with a count of orders taken and a column called "Shipped" that displays "On Time" if the order shipped on time and "Late" if the order shipped late.

BONUS QUESTION 1

Order by employee last_name, then by first_name and then descending by number of orders.

NOTE:
An order is considered to be delivered 'On Time' if required_date > shipped_date

TABLE

employees

employee_id	last_name	first_name	title	title_of_courtesy	birth_date	hire_date	address	city	region	postal_code	country	home_phone	extension	reports_to
1	Davolio	Nancy	Sales Representative	Ms.	1968-12-08	2012-05-01	507 - 20th Ave. E.Apt. 2A	Seattle	North America	98122	USA	(206) 555-9857	5467	2
2	Fuller	Andrew	Vice President, Sales	Dr.	1972-02-19	2012-08-14	908 W. Capital Way	Tacoma	North America	98401	USA	(206) 555-9482	3457	NULL
3	Leverling	Janet	Sales Representative	Ms.	1983-08-30	2012-04-01	722 Moss Bay Blvd.	Kirkland	North America	98033	USA	(206) 555-3412	3355	2

orders

order_id	customer_id	employee_id	order_date	required_date	shipped_date	ship_via	freight	ship_name	ship_address	ship_city	ship_region	ship_postal_code	ship_country
10248	VINET	5	2016-07-04	2016-08-01	2016-07-16	3	32.38	Vins et alcools Chevalier	59 rue de l-Abbaye	Reims	Western Europe	51100	France
10249	TOMSP	6	2016-07-05	2016-08-16	2016-07-10	1	11.61	Toms Spezialitäten	Luisenstr. 48	Münster	Western Europe	44087	Germany
10250	HANAR	4	2016-07-08	2016-08-05	2016-07-12	2	65.83	Hanari Carnes	Rua do Paço, 67	Rio de Janeiro	South America	05454-876	Brazil

APPROACH

Step 1: JOIN to combine employees and orders table based on common column i.e. employee_id

Step 2: COUNT() to get num_orders

Step 3: CASE to identify 'On Time' and 'Late' delivery of orders

RESULT

employee_id	last_name	first_name	title	title_of_courtesy	birth_date	hire_date	address	city	region	postal_code	country	home_phone	extension	reports_to
1	Davolio	Nancy	Sales Representative	Ms.	1968-12-08	2012-05-01	507 - 20th Ave. E.Apt. 2A	Seattle	North America	98122	USA	(206) 555-9857	5467	2
2	Fuller	Andrew	Vice President, Sales	Dr.	1972-02-19	2012-08-14	908 W. Capital Way	Tacoma	North America	98401	USA	(206) 555-9482	3457	NULL
3	Leverling	Janet	Sales Representative	Ms.	1983-08-30	2012-04-01	722 Moss Bay Blvd.	Kirkland	North America	98033	USA	(206) 555-3412	3355	2

order_id	customer_id	employee_id	order_date	required_date	shipped_date	ship_via	freight	ship_name	ship_address	ship_city	ship_region	ship_postal_code	ship_country
10248	VINET	5	2016-07-04	2016-08-01	2016-07-16	3	32.38	Vins et alcools Chevalier	59 rue de l-Abbaye	Reims	Western Europe	51100	France
10249	TOMSP	6	2016-07-05	2016-08-16	2016-07-10	1	11.61	Toms Spezialitäten	Luisenstr. 48	Münster	Western Europe	44087	Germany
10250	HANAR	4	2016-07-08	2016-08-05	2016-07-12	2	65.83	Hanari Carnes	Rua do Paço, 67	Rio de Janeiro	South America	05454-876	Brazil

first_name	last_name	num_orders	Shipped
Steven	Buchanan	41	On Time
Steven	Buchanan	1	Late
Laura	Callahan	95	On Time
Laura	Callahan	9	Late
Nancy	Davolio	117	On Time
Nancy	Davolio	6	Late

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Senthil Arul, Consultant