ACIT 1630 - Relational Database Design and SQL

Project 2 - Blog Website Database

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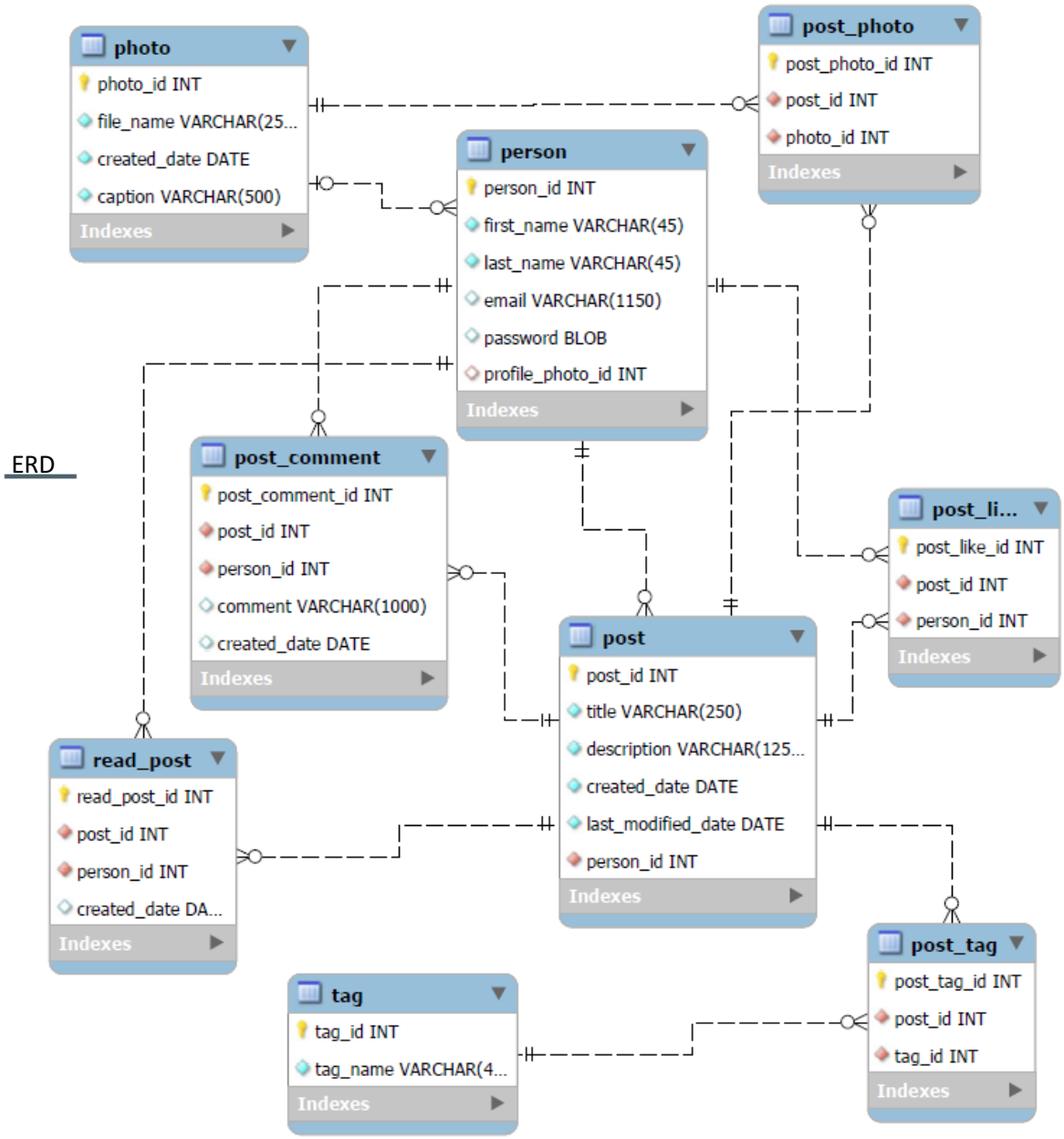
Introduction:

You are creating the database for a simple blogging website. Given the Entity Relationship Diagram (ERD) on the next page, you will be creating the database and tables from scratch and populating them with some data.

Once the database has been created and populated with data, you will be querying the data to get some information regarding the posts in the database.

ERD



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Create the Database and Tables:

Create a plan to create the tables and insert the data *in the correct order*. Remember that if you try to create tables and add the data in the wrong order, you'll get foreign key constraint errors. Which tables do you have to create and add data to *first*? Alternatively, create all of the tables first, and then add the foreign keys.

Ensure you have the AUTO_INCREMENT Property turned on for all primary keys as indicated in the ERD.

Note: Add today's date (use the `NOW()` function) as the default date to the `created_date` and `last_modified_date` when creating the following tables:

1. photo (created_date)
2. post (created_date and last_modified_date)
3. post_comment (created_date)
4. read_post (created_date)

Add the Data:

Create `INSERT` statements to insert the following data into the tables. You will be submitting these `INSERT` statements as part of your submission.

Person

first_name	**last_name**	**email**	**password_hash**	**profile_photo**
Barbara	Hodge	b.hodge@company.com	AES_ENCRYPT('P@ssword!','aseed')	Barbara's profile
James	Buckles	j.buckles@company.com	AES_ENCRYPT ('Awesome8','aseed')	James' Profile
Natalie	Wilhite	bestest.forever@example.com	AES_ENCRYPT ('CakeIsBest','aseed')	NULL
Mary	Barnett	lifeisahighway@example.com	AES_ENCRYPT ('goGOgo','aseed')	Mary
Richard	Tipton	tippertapper266602@gmail.com	AES_ENCRYPT ('tiptap','aseed')	Richard

Note: AES_ENCRYPT is a MySQL function that encrypts the user's password using a key provided by the user, so that no one can see it and gain access to their account. When creating your `INSERT` statements use this function to protect the users passwords. Example: Don't just store 'P@ssword!' as Barbara's password, use AES_ENCRYPT to protect the AES_ENCRYPT. If you did a `SELECT * FROM Person;` after the `INSERT`s, it should look something like this:

```
35
36 •   select * from person;
37
38
39
```

Result Grid | Filter Rows: | Edit: | Export/Import:

person_id	first_name	last_name	email	password	profile_photo_id
1	Barbara	Hodge	b.hodge@company.com	BLOB	1
2	James	Buckles	j.buckles@company.com	BLOB	2
3	Natalie	Wilhite	bestest.forever@example.com	BLOB	NULL
4	Mary	Barnett	lifeisahighway@example.com	BLOB	3
5	Richard	Tipton	tippertapper266602@gmail.com	BLOB	5
NULL	NULL	NULL	NULL	NULL	NULL

Note that AES_ENCRYPT is a binary large object (BLOB) and cannot be read unless decrypted using the correct seed encryption key that was used when it was created. For example, to get the actual passwords in readable format:

```
35
36 •   select first_name, last_name,
37     cast(AES_DECRYPT(password,'aseed') as char(40)) as 'Decripted Password'
38     from person;
39
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

first_name	last_name	Decripted Password
Barbara	Hodge	P@ssword!
James	Buckles	Awesome8
Natalie	Wilhite	CakeIsBest
Mary	Barnett	goGOgo
Richard	Tipton	tiptap

Post

title	description	created_date	last_modified_date	author
Mickey Mouse Cookies	I found this great recipe for sugar cookies and a new Mickey Mouse cookie cutter.	2019-04-14	2019-04-15	Barbara
Touques for infants	I'm knitting touques for our grandchild that should be born soon!	2019-02-15	2019-02-16	Natalie
Our newest family member!	Congratulations to our daughter on their new bundle of joy! Theresa May - Born March 3, 2019.	2019-03-04	2019-03-04	Natalie
Rainbow Quilt	Beautiful new rainbow quilt for our newest granddaughter.	2019-03-29	2019-04-01	Natalie
New Car Stereo and Speakers	Best Bass Ever! You can hear me from 5 blocks away!	2019-05-09	2019-05-09	James
Garden Shed	New garden shed has room for the lawn mowers and all our garden tools.	2019-05-22	2019-05-22	James
Great way to hang pictures	It's simple and cost effective!	2019-04-27	2019-04-27	Mary
Beautiful colour, beautiful smell	Found a great place to buy the best roses!	2019-04-14	2019-04-16	Mary
Set of golf clubs for sale	A friend of mine is selling his set of clubs before he moves to Saskatchewan.	2019-05-12	2019-05-15	James
Change your own oil, save hundreds!	Mechanics are too expensive, and it's not that hard to do it yourself.	2019-02-22	2019-02-22	James

Awesome Floor Mats	Keep your car clean with these awesome car mats!	2019-03-03	2019-03-03	James

Note: for INSERTing values that contain a single quote, use a double quote - otherwise you will run into an error message.

Example:

```
INSERT INTO post_comment
(post_id, person_id, comment)
VALUES
(1,3,”I'm going to try those myself!”);
```

Use doublequotes here instead of single.

Post (photos, reads, likes and comments)

title	**read_by**	**photos**	**liked_by**	**comments**
Mickey Mouse Cookies	Mary, Natalie	Mickey Mouse Cookies	Natalie	I'm going to try those myself! - *Natalie*
Touques for infants	Mary	Knitted Touques	Mary	NULL
Our newest family member!	Barbara, James, Mary, Richard	Smiling already!, So cute!	Barbara, James, Mary, Richard	Congratulations! - *Barbara*, How does it feel to be a grandma? - *James*
Rainbow Quilt	Barbara	Rainbow Quilt	NULL	Can you make me one next? - *Barbara*
New Car Stereo and Speakers	Richard	Bass Speakers Installed, Front Panel	Richard	NULL
Garden Shed	Barbara, Richard	Shed inside empty	NULL	What colour are you going to paint your shed? - *Barbara*
Great way to hang pictures	Barbara	NULL	NULL	NULL

Beautiful colour, beautiful smell	NULL	Rose	NULL	NULL
Set of golf clubs for sale	Richard	9 Iron, Driver, Putter	Richard	I need a good set of club; I'll take them! - *Richard*
Change your own oil, save hundreds!	Richard	NULL	NULL	NULL
Awesome Floor Mats	Barbara	NULL	NULL	NULL

Note:
As shown above, the following Post ("Our newest family member!"), has been **read by 4 people** (Barbara, James, Mary and Richard), **has 2 photos** (with captions: "Smiling already!" and "So cute!"), is **liked by 4 people** (Barbara, James, Mary and Richard) and **has 2 comments** ("Congratulations" written by Barbara and "How does it feel to be a grandma?" written by James).

title	**read_by**	**photos**	**liked_by**	**comments**
Our newest family member!	Barbara, James, Mary, Richard	Smiling already!, So cute!	Barbara, James, Mary, Richard	Congratulations! - *Barbara*, How does it feel to be a grandma? - *James*

Photo

file_name	**created_date**	**caption**
barbara_profile.jpg	2019-06-15	Barbara's profile
img_9203710.jpg	2019-06-15	James' Profile
dcim_38118385.jpg	2019-06-15	Mary
knitting.jpg	2019-06-15	Knitted Touques
img_28391910488.jpg	2019-06-15	Richard
img_21838392835.jpg	2019-06-15	Mickey Mouse Cookies
img_38201884043.jpg	2019-06-15	So cute!

img_28320384855.jpg	2019-06-15	Smiling already!
rainbow.jpg	2019-06-15	Rainbow Quilt
stereo1.jpg	2019-06-15	Front Panel
stereo2.jpg	2019-06-15	Bass Speakers Installed
new_shed.jpg	2019-06-15	Shed inside empty
rose.jpg	2019-06-15	Rose
putter.jpg	2019-06-15	Putter
nine-iron.jpg	2019-06-15	9 Iron
driver.jpg	2019-06-15	Driver

Post (tags)

title	**tags**
Mickey Mouse Cookies	baking, cooking, crafts
Touques for infants	crafts, DIY
Our newest family member!	NULL
Rainbow Quilt	crafts, DIY
New Car Stereo and Speakers	cars, DIY
Garden Shed	DIY, home repair
Great way to hang pictures	home repair
Beautiful colour, beautiful smell	NULL
Set of golf clubs for sale	sports
Change your own oil, save hundreds!	cars, DIY
Awesome Floor Mats	cars

Create the following tags that currently don't have any posts.

tag
music

shopping

Queries:

After creating your database and tables, and after you have added the data to the tables, think about how to answer the following questions by writing queries (SELECT statements).

IMPORTANT: Make sure that your queries are *specific* and would still work if additional rows were added to the tables.
Example: If asked to find everyone who lives in 'BC' from the following table:

person_id	firstName	lastName	house	street	city	prov
1	Paul	Waldman	2333	Roger St	Nanaimo	BC
2	Lynn	William	3028	Blue Rocks Rd	Mahone Bay	NS
3	Bruce	William	3417	Haaglund Rd	Grand Forks	BC
4	Jacki	Ballweg	1573	Burdett Av	Victoria	BC
5	Kathy	Bromberg	538	Lock St	Guelph	ON

This is **not an acceptable answer** (even if it produces the correct output):

```
SELECT firstName, lastName
FROM person
WHERE person_id IN (1,3,4);
```

You **must** write the SELECT statement as *generic* queries - example:

```
SELECT firstName, lastName
FROM person
WHERE prov LIKE 'BC';
```

1. Find all posts with tag 'DIY'.

title	tag_name
Touques for infants	DIY
Rainbow Quilt	DIY
New Car Stereo and Speakers	DIY
Garden Shed	DIY

Change your own oil, save hundreds!	DIY

2. List all post tags for a certain post (the post with 'Mickey Mouse Cookies').

title	**tag_name**
Mickey Mouse Cookies	cooking
Mickey Mouse Cookies	baking
Mickey Mouse Cookies	crafts

3. Which post has the most tags? List all posts with the count of tags (sorted largest to smallest).
   Note: Include **ALL** posts.
   If a post doesn't have any tags it should still be in the list with a count of zero.

title	**Number of Tags**
Mickey Mouse Cookies	3
New Car Stereo and Speakers	2
Rainbow Quilt	2
Change your own oil, save hundreds!	2
Garden Shed	2
Touques for infants	2
Great way to hang pictures	1
Awesome Floor Mats	1
Set of golf clubs for sale	1
Our newest family member!	0
Beautiful colour, beautiful smell	0

4. Which posts have no tags?
   Similar to the previous question, list only posts with zero tags.

title	Number of Tags
Our newest family member!	0
Beautiful colour, beautiful smell	0

5. Which tag has the most posts? Get a count of how many posts per tag (sorted largest to smallest).
   Note: Include **ALL** tags.
   If a tag doesn't have any posts it should still be in the list with a count of zero.

tag_name	Number of Posts
DIY	5
cars	3
crafts	3
home repair	2
baking	1
cooking	1
sports	1
music	0
shopping	0

6. Find all the posts that have been read.
   Hint: Use a subquery to get a list of the `post_id`s from `read_post`. Use your outer query to get the `post_id`, `title` and author's `first_name` of the posts that are read.

post_id	title	first_name
1	Mickey Mouse Cookies	Barbara
2	Touques for infants	Natalie
3	Our newest family member!	Natalie

4	Rainbow Quilt	Natalie
5	New Car Stereo and Speakers	James
6	Garden Shed	James
7	Great way to hang pictures	Mary
9	Set of golf clubs for sale	James
10	Change your own oil, save hundreds!	James
11	Awesome Floor Mats	James

7. Find all the posts that have not been read.
   Similar to the previous question, but this time, all posts that have NOT been read.

post_id	title	first_name
8	Beautiful colour, beautiful smell	Mary

8. Find all the posts that have been *edited after* they were created.

post_id	title	first_name	created_date	last_modified_date
1	Mickey Mouse Cookies	Barbara	2019-04-14	2019-04-15
2	Touques for infants	Natalie	2019-02-15	2019-02-16
4	Rainbow Quilt	Natalie	2019-03-29	2019-04-01
8	Beautiful colour, beautiful smell	Mary	2019-04-14	2019-04-16
9	Set of golf clubs for sale	James	2019-05-12	2019-05-15

9. Find all the posts that don't have photos.

post_id	title	first_name
7	Great way to hang pictures	Mary
10	Change your own oil, save hundreds!	James
11	Awesome Floor Mats	James

10. Find the most popular posts (with the most likes). Note: Include **ALL** posts even if they aren't liked.

title	**Number of Likes**
Our newest family member!	4
Mickey Mouse Cookies	1
New Car Stereo and Speakers	1
Set of golf clubs for sale	1
Touques for infants	1
Rainbow Quilt	0
Awesome Floor Mats	0
Beautiful colour, beautiful smell	0
Change your own oil, save hundreds!	0
Garden Shed	0
Great way to hang pictures	0

11. Who has the most posts? Least?

first_name	**last_name**	**Number of Posts**
James	Buckles	5

first_name	**last_name**	**Number of Posts**
Richard	Tipton	0

12. List all posts that have photos and all of their comments (if they have comments).

post_id	title	author	comment	commenter
1	Mickey Mouse Cookies	Barbara	I'm going to try those myself!	Natalie
2	Touques for infants	Natalie	NULL	NULL
3	Our newest family member!	Natalie	Congratulations!	Barbara
3	Our newest family member!	Natalie	How does it feel to be a grandma?	James
4	Rainbow Quilt	Natalie	Can you make me one next?	Barbara
5	New Car Stereo and Speakers	James	NULL	NULL
6	Garden Shed	James	What colour are you going to paint your shed?	Barbara
8	Beautiful colour, beautiful smell	Mary	NULL	NULL
9	Set of golf clubs for sale	James	I need a good set of clubs; I'll take them!	Richard

13. List all posts. Include a count of the number of reads, number of likes and number of comments for each post. If a post doesn't have any reads, likes or comments, the value for this count should be zero.
    Hint: Think subqueries for the column list to get the counts for reads, likes and comments.

post_id	title	reads	likes	comments
1	Mickey Mouse Cookies	2	1	1
2	Touques for infants	1	1	0
3	Our newest family member!	4	4	2
4	Rainbow Quilt	1	0	1
5	New Car Stereo and Speakers	1	1	0
6	Garden Shed	2	0	1
7	Great way to hang pictures	1	0	0
8	Beautiful colour, beautiful smell	0	0	0

9	Set of golf clubs for sale	1	1	1
10	Change your own oil, save hundreds!	1	0	0
11	Awesome Floor Mats	1	0	0

14. List photos as either profile photos or post photos.
    Hint: Create a query to show all profile photos, then create a query to show all post photos and add the rows together. What keyword(s) add rows of 2 queries together?

photo_id	**caption**	**file_name**	**type**
1	Barbara's profile	barbara_profile.jpg	Profile Photo
2	James' Profile	img_9203710.jpg	Profile Photo
3	Mary	dcim_38118385.jpg	Profile Photo
5	Richard	img_28391910488.jpg	Profile Photo
4	Knitted Touques	knitting.jpg	Post Photo
6	Mickey Mouse Cookies	img_21838392835.jpg	Post Photo
7	So cute!	img_38201884043.jpg	Post Photo
8	Smiling already!	img_28320384855.jpg	Post Photo
9	Rainbow Quilt	rainbow.jpg	Post Photo
10	Front Panel	stereo1.jpg	Post Photo
11	Bass Speakers Installed	stereo2.jpg	Post Photo
12	Shed inside empty	new_shed.jpg	Post Photo
13	Rose	rose.jpg	Post Photo
14	Putter	putter.jpg	Post Photo
15	9 Iron	nine-iron.jpg	Post Photo
16	Driver	driver.jpg	Post Photo

Marking Criteria:

Criteria	**Marks**
INSERT statements used to create the data in the tables • Tables: o Person o Photo o Tag o Post_Comment o Post_Like o Post o Post_Photo o Post_Tag o Read_Post • Data is correct. • Correct use of AES_ENCRYPT() to encrypt passwords. • Correct use of default dates for create_date. • Correct use of Identity Primary Keys. • Database must enforce correct Foreign Keys as indicated in the ERD.	**10 marks**
SELECT queries to produce the results of the 14 queries: 1. Find all posts with tag 'DIY'. **[1 mark]** 2. List all post tags for a certain post (the post with 'Mickey Mouse Cookies'). **[1 mark]** 3. Which post has the most tags? List all posts with the count of tags (sorted largest to smallest). **[2 marks]** 4. Which posts have no tags? **[2 marks]** 5. Which tag has the most posts? Get a count of how many posts per tag (sorted largest to smallest). **[2 marks]** 6. Find all the posts that have been read. **[2 marks]** 7. Find all the posts that have not been read. **[2 marks]** 8. Find all the posts that have been *edited after* they were created. **[2 marks]** 9. Find all the posts that don't have photos. **[2 marks]** 10. Find the most popular posts (with the most likes). **[2 marks]** 11. Who has the most posts? Least? **[2 marks]** 12. List all posts that have photos and all of their comments (if they have comments). **[2 marks]** 13. List all posts. Include a count of the number of reads, number of likes and number of comments for each post. **[4 marks]** 14. List photos as either profile photos or post photos. **[4 marks]**	**30 marks total**
Total:	**40 marks**

Submission Requirements:

Submissions:	**File name:**
An SQL file containing the INSERT statements used to create the data inside your tables.	Blog_Data.sql
An SQL file containing the SELECT queries (all 14).	SELECT_Queries.sql
A Logical Backup of the database. Create a Logical Backup of the database by going into the database tasks and 'Generating Scripts'. **IMPORTANT:** Make sure you include "Schema and Data".	Blog_Backup.sql