

**University of British Columbia  
Department of Computer Science  
CPSC 304 2021  
Summer Term 1**

**Group Project - Implementation of a Relational  
Database**

<b>Project Title:</b>	<b>COVID-19 Immunization System</b>
<b>Project Milestone:</b>	<b>4a - Implementation</b>

#	Student Name	Student Number	Email Address
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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above.

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

**A short description of the final project, and what it accomplished:**

This project is a website which replicates the basic features of a COVID-19 immunization system from multiple perspectives. There are three views:

1. **General public (patient)** - this view allows members of the public to
  - a. register for a vaccine appointment
  - b. find all the clinics in a specified Canadian province or territory
2. **Volunteer** - this view allows volunteer staff members to check patients into a clinic
3. **Supervisor** - this view allows supervisor staff members to
  - a. find the vaccine types currently stored in the system
  - b. find the clinics that store all vaccine types
  - c. find the vaccine type distribution amongst patients of a specified age group
  - d. find the # of registered patients at a specified clinic
  - e. remove a clinic from the system
  - f. browse the patient registry by various attributes

The project was written in PHP with an HTML/CSS front-end and an Oracle database backend hosted on the UBC CS undergraduate servers.

**A description of how your final schema differed from the schema you turned in. If the final schema differed, why?**

We made a few changes to our design for this milestone. They are as follows (please feel free to also refer to the ERD we uploaded to our GitHub repo):

1. We applied a Strong-Weak entity relationship to “Clinics/Booths” instead of having each booth have a unique ID across the entire system. We thought that this was more practical and realistic, and so we changed our original weak entity, “Immunization Record Update”, to an attribute of the “receive” relationship.
2. In our original design, we had 1 table for each of the Staff subclasses and no table for the superclass. We realized that this would not work with our “employ” relationship with Clinics, so we added a table for the Staff superclass.
3. We added a key constraint between Staff and employ, so that every staff member should be employed by at most 1 clinic. It makes logical sense that they would be employed at 1 clinic.
4. We removed the “name” attribute from Vaccines. It didn’t make sense for both Vaccines and Manufacturers to have a name (referring to the vaccine type), so we agreed that the name attribute associated with Manufacturers would be the vaccine type (example: Moderna).
5. We switched Addresses from an entity set to attributes of Patients and Clinics since within our simplified website implementation each entity set could only have one address.

**Screenshots of the queries:**

Insert	<div data-bbox="386 247 1422 894"> <pre>SQL&gt; select * from patients;</pre> <pre> PERSONAL_HEALTH_NUM ----- FULL_NAME ----- BIRTH_DAT ----- EMAIL ----- PHONE          BUILDING_N ----- STREET ----- POSTAL_ CITY          PR STAFF_ID          REGISTRATI ----- PH-0123456789 Kimia Rostin 06-AUG-01 kimia@gmail.com 778-123-4567 1000 Blueberry Ln M3C 0E3 Toronto          ON staff-0          R-1A2S3D4F </pre> </div> <div data-bbox="386 915 987 1661"> <p><b><u>Register for your vaccine:</u></b></p> <p>Personal Health Number: <input type="text" value="PH-0000000000"/></p> <p>Full Name: <input type="text" value="Natsuya Kirishima"/></p> <p>Birth Date: <input type="text" value="1998 - 07 - 14"/> </p> <p>Email: <input type="text" value="natsu@hotmail.com"/></p> <p>Phone: <input type="text" value="778-345-9385"/></p> <p>Building Number: <input type="text" value="10"/></p> <p>Street: <input type="text" value="Iwatobi Rd"/></p> <p>Postal Code: <input type="text" value="V3B 0B1"/></p> <p>City: <input type="text" value="Coquitlam"/></p> <p>Province: <input type="text" value="BC"/></p> <p><input type="button" value="Register"/></p> </div>
--------	---

```
SQL> select * from patients;
```

```
PERSONAL_HEALTH_NUM
```

```
FULL_NAME
```

```
BIRTH_DAT
```

```
EMAIL
```

```
PHONE          BUILDING_N
```

```
STREET
```

```
POSTAL_ CITY          PR STAFF_ID          REGISTRATI
```

```
PH-0000000000
```

```
Natsuya Kirishima
```

```
14-JUL-98
```

```
natsu@hotmail.com
```

```
778-345-9385 10
```

```
Iwatobi Rd
```

```
V3B 0B1 Coquitlam
```

```
BC
```

```
R-60c798d1
```

```
PH-0123456789
```

```
Kimia Rostin
```

```
06-AUG-01
```

```
kimia@gmail.com
```

```
778-123-4567 1000
```

```
Blueberry Ln
```

```
M3C 0E3 Toronto
```

```
ON staff-0
```

```
R-1A2S3D4F
```

Delete	<div>SQL&gt; select * from clinics;</div> <div><table><thead><tr><th>CLINIC_ID</th><th>CLINIC_TYPE</th><th>BUILDING_N</th><th>STREET</th><th>POSTAL_</th><th>CITY</th><th>PR</th></tr></thead><tbody><tr><td>clinic-0</td><td>office</td><td>205</td><td>Newport Dr</td><td>V3H 5C9</td><td>Coquitlam</td><td>BC</td></tr><tr><td>clinic-1</td><td>pop-up</td><td>618</td><td>Poirier St</td><td>V3J 6A9</td><td>Vancouver</td><td>BC</td></tr><tr><td>clinic-2</td><td>pharmacy</td><td>2440</td><td>Dundas St</td><td>M6P 1W9</td><td>Toronto</td><td>ON</td></tr></tbody></table></div> <div>SQL&gt; select * from booths;</div> <div><table><thead><tr><th>BOOTH_ID</th><th>CLINIC_ID</th></tr></thead><tbody><tr><td>booth-1A</td><td>clinic-0</td></tr><tr><td>booth-1B</td><td>clinic-0</td></tr><tr><td>booth-2A</td><td>clinic-1</td></tr></tbody></table></div>	CLINIC_ID	CLINIC_TYPE	BUILDING_N	STREET	POSTAL_	CITY	PR	clinic-0	office	205	Newport Dr	V3H 5C9	Coquitlam	BC	clinic-1	pop-up	618	Poirier St	V3J 6A9	Vancouver	BC	clinic-2	pharmacy	2440	Dundas St	M6P 1W9	Toronto	ON	BOOTH_ID	CLINIC_ID	booth-1A	clinic-0	booth-1B	clinic-0	booth-2A	clinic-1
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booth-2A	clinic-1																																				

# Staff - Supervisors

## Remove clinic from system:

Clinic ID:

```
SQL> select * from clinics;

CLINIC_ID
-----
CLINIC_TYPE
-----
BUILDING_N
-----
STREET
-----
POSTAL_ CITY                                PR
----- --
clinic-1
pop-up
618
Poirier St
V3J 6A9 Vancouver                                BC

clinic-2
pharmacy
2440
Dundas St
M6P 1W9 Toronto                                ON
```

```
SQL> select * from booths;

BOOTH_ID    CLINIC_ID
-----
booth-2A    clinic-1
```

Update	<p>PH-0000000001 Ikuya Kirishima 04-MAR-01 ikuya1@gmail.com 778-834-9393 10 Iwatobi Rd V3B 0B1 Coquitlam</p> <p>PH-1212121212 Albert Wahlander 14-JUN-04 champ12@yahoo.ca 604-553-2443 132 Warden Ave M1R 2R3 Scarborough</p>			BC staff-3	R-60c79b6a
	<h2 style="text-align: center;"><u>Staff - Volunteers</u></h2> <div style="background-color: #ffcc00; padding: 10px; border: 2px solid black; margin: 10px 0;"> <p><b><u>Patient Check-In:</u></b></p> <p>Patient's Personal Health Number: <input type="text" value="PH-1212121212"/></p> <p>Volunteer Staff ID: <input type="text" value="staff-0"/></p> <p><input type="button" value="Check Patient In"/></p> </div>				
	<p>PH-0000000001 Ikuya Kirishima 04-MAR-01 ikuya1@gmail.com 778-834-9393 10 Iwatobi Rd V3B 0B1 Coquitlam</p> <p>PH-1212121212 Albert Wahlander 14-JUN-04 champ12@yahoo.ca 604-553-2443 132 Warden Ave M1R 2R3 Scarborough</p>			BC staff-3	R-60c79b6a
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<p><b>Selection</b></p>	<div style="background-color: #FFD700; padding: 10px; border: 2px solid black; text-align: center;"> <h2><u>Find an immunization clinic near you:</u></h2> <p>Select Province: <span style="border: 1px solid black; padding: 2px 10px;">Ontario ▼</span></p> <p><span style="border: 1px solid black; padding: 5px 15px;">Find Clinics</span></p> </div> <div style="text-align: center; margin-top: 10px;"> <p><small>CLINICS FOUND IN ONTARIO</small></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Clinic Name</th> <th>Clinic Type</th> <th>Building #</th> <th>Street</th> <th>Postal Code</th> <th>City</th> </tr> </thead> <tbody> <tr> <td>Shoppers Drug Mart</td> <td>pharmacy</td> <td>2440</td> <td>Dundas St</td> <td>M6P 1W9</td> <td>Toronto</td> </tr> <tr> <td>Deloitte</td> <td>office</td> <td>8</td> <td>Adelaide St W</td> <td>M8L 1A2</td> <td>Toronto</td> </tr> <tr> <td>Rexall</td> <td>pharmacy</td> <td>3555</td> <td>Don Mills Rd</td> <td>M2H 3N3</td> <td>North York</td> </tr> <tr> <td>Leslie Center</td> <td>pop-up</td> <td>145</td> <td>Leslie St</td> <td>M2L 8Q4</td> <td>North York</td> </tr> <tr> <td>Bur Oak Drugs</td> <td>pharmacy</td> <td>24</td> <td>Bur Oak Ave</td> <td>M3I 2N5</td> <td>Markham</td> </tr> <tr> <td>Mississauga Community Center</td> <td>community centre</td> <td>8</td> <td>Yonge St</td> <td>M6P 1W9</td> <td>Mississauga</td> </tr> <tr> <td>Oakville General Hospital</td> <td>hospital</td> <td>2440</td> <td>Pinecone St</td> <td>M5Y 2A7</td> <td>Oakville</td> </tr> </tbody> </table> </div>	Clinic Name	Clinic Type	Building #	Street	Postal Code	City	Shoppers Drug Mart	pharmacy	2440	Dundas St	M6P 1W9	Toronto	Deloitte	office	8	Adelaide St W	M8L 1A2	Toronto	Rexall	pharmacy	3555	Don Mills Rd	M2H 3N3	North York	Leslie Center	pop-up	145	Leslie St	M2L 8Q4	North York	Bur Oak Drugs	pharmacy	24	Bur Oak Ave	M3I 2N5	Markham	Mississauga Community Center	community centre	8	Yonge St	M6P 1W9	Mississauga	Oakville General Hospital	hospital	2440	Pinecone St	M5Y 2A7	Oakville
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<p><b>Projection</b></p>	<div style="background-color: #FFD700; padding: 10px; border: 2px solid black; text-align: center;"> <h2><u>Browse patient registry by:</u></h2> <div style="display: flex; flex-direction: column; align-items: flex-start;"> <div><input checked="" type="checkbox"/> Name</div> <div><input checked="" type="checkbox"/> Personal Health Number</div> <div><input type="checkbox"/> Birth Date</div> <div><input type="checkbox"/> Email</div> <div><input type="checkbox"/> Phone</div> <div><input type="checkbox"/> City</div> <div><input checked="" type="checkbox"/> Province</div> <div><input checked="" type="checkbox"/> Registration Code</div> </div> <p><span style="border: 1px solid black; padding: 5px 15px;">Go</span></p> </div> <div style="text-align: center; margin-top: 10px;"> <p><small>PATIENTS</small></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>full_name</th> <th>personal_health_num</th> <th>province</th> <th>registration_code</th> </tr> </thead> <tbody> <tr> <td>Kimia Rostin</td> <td>PH-0123456789</td> <td>ON</td> <td>R-1a2s3d4f</td> </tr> <tr> <td>Lauren Lowe</td> <td>PH-1234567890</td> <td>BC</td> <td>R-1b2s3d4f</td> </tr> <tr> <td>Angela Zhou</td> <td>PH-2345678901</td> <td>ON</td> <td>R-1c2s3d4f</td> </tr> <tr> <td>Sousuke Yamazaki</td> <td>PH-3456789012</td> <td>BC</td> <td>R-1d2s3d4f</td> </tr> <tr> <td>Liam Lawliet</td> <td>PH-4567890123</td> <td>YT</td> <td>R-1e2s3d4f</td> </tr> </tbody> </table> </div>	full_name	personal_health_num	province	registration_code	Kimia Rostin	PH-0123456789	ON	R-1a2s3d4f	Lauren Lowe	PH-1234567890	BC	R-1b2s3d4f	Angela Zhou	PH-2345678901	ON	R-1c2s3d4f	Sousuke Yamazaki	PH-3456789012	BC	R-1d2s3d4f	Liam Lawliet	PH-4567890123	YT	R-1e2s3d4f																								
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Join

```
SQL> select * from vaccines;
```

VACCINE_ID	MANUFACTURER_ID
vaccine-0	manufacturer-0
vaccine-1	manufacturer-0
vaccine-2	manufacturer-0
vaccine-3	manufacturer-1
vaccine-4	manufacturer-1
vaccine-5	manufacturer-2
vaccine-6	manufacturer-2
vaccine-7	manufacturer-3
vaccine-8	manufacturer-3
vaccine-9	manufacturer-3
vaccine-10	manufacturer-4

11 rows selected.

```
SQL> select * from store;
```

CLINIC_ID	VACCINE_ID
clinic-1	vaccine-0
clinic-1	vaccine-6
clinic-4	vaccine-2

```
SQL> select * from manufacturers;
```

MANUFACTURER_ID	VACCINE_NAME
manufacturer-0	Moderna
manufacturer-1	Moderna
manufacturer-2	Pfizer-BioNTech
manufacturer-3	AstraZeneca
manufacturer-4	Janssen

	<div data-bbox="402 226 1406 422"> <p><b><u>Find all the vaccine types used in clinics:</u></b></p> <p><input type="button" value="Go"/></p> </div> <div data-bbox="824 453 979 470"> <p>VACCINES USED IN SYSTEM</p> </div> <table border="1" data-bbox="389 485 1419 541"> <tr> <td>Pfizer-BioNTech</td> </tr> <tr> <td>Moderna</td> </tr> </table>	Pfizer-BioNTech	Moderna						
Pfizer-BioNTech									
Moderna									
<p><b>Aggregation</b></p>	<div data-bbox="407 600 1406 863"> <p><b><u>Find # of registered patients at clinic:</u></b></p> <p>Clinic ID: <input type="text" value="clinic-1"/></p> <p><input type="button" value="Go"/></p> </div> <p data-bbox="646 915 1162 947">There is 1 patient registered at this clinic.</p>								
<p><b>Nested aggregation with group-by</b></p>	<div data-bbox="399 1010 1411 1276"> <p><b><u>Vaccine distribution amongst patients:</u></b></p> <p>Find the vaccine distribution amongst patients <input type="text" value="&lt;="/> <input type="text" value="30"/> years old.</p> <p><input type="button" value="Go"/></p> </div> <div data-bbox="735 1297 1073 1314"> <p>VACCINE DISTRIBUTION AMONGST PATIENTS &lt;= 30 YEARS OLD</p> </div> <table border="1" data-bbox="389 1329 1419 1440"> <tr> <td>Pfizer-BioNTech</td><td>1</td></tr> <tr> <td>Moderna</td><td>2</td></tr> <tr> <td>Janssen</td><td>2</td></tr> <tr> <td>AstraZeneca</td><td>1</td></tr> </table>	Pfizer-BioNTech	1	Moderna	2	Janssen	2	AstraZeneca	1
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Moderna	2								
Janssen	2								
AstraZeneca	1								
<p><b>Division</b></p>	<div data-bbox="399 1497 1406 1696"> <p><b><u>Find clinics that store all vaccine types:</u></b></p> <p><input type="button" value="Go"/></p> </div> <div data-bbox="786 1717 1024 1734"> <p>CLINICS THAT STORE EVERY VACCINE TYPE</p> </div> <table border="1" data-bbox="389 1749 1419 1803"> <tr> <td>clinic-0</td> </tr> <tr> <td>clinic-4</td> </tr> </table>	clinic-0	clinic-4						
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