University of British Columbia, Vancouver
Department of Computer Science

CPSC 304 Project Cover Page

Milestone #: 4

Date: Nov 27th, 2023

Group Number: 108

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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 the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

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

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Repository Link

https://github.students.cs.ubc.ca/CPSC304-2023W-T1/project_d8a1h_m9y6l_z7w3p

SQL Script to Create All the Tables and Data in the Database

Can be found in our repository: **project_d8a1h_m9y6l_z7w3p/SQLTables.sql**

Project Description: Description of Final Project

We are making an application for the **co-op program**, so the domain would be **student co-op application management**. The database will provide storage and retrieval of data related to various aspects of a co-op program. Some key aspects of the domain that the database will support includes: student profiles, job applications, coordinator information, and application history. The users can insert, filter, and count different data related to students, advisors, and job postings.

Project Description: Changes in Final Schema

A large portion of our Diagram went unimplemented due to time constraints.
The Student Class received some changes in column names due to it conflicting with SQL
Some Time types were changed

Project Description: Schemas After Initialization

JobPostingOfferedPosted(PostingID, Term, Duration, DatePosted, Deadline, Position, **CompanyName**, **BoardTitle**)

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
20	Company 2	Product Manager	2023-12-01	Spring	4	2023-12-04
21	Company 2	IT Specialist	2023-12-01	Spring	4	2023-12-04

EmployedCoopAdvisor(<u>AdvisorID</u>, AdvisorName, AdvisorEmail, **DeptName**, **UniversityName**, **PostalCode**)

Coop Advisors

AdvisorID	Name	Email	Department
1	Advisor 1	advisor1@ubc.ca	Dept 1
2	Advisor 2	advisor2@waterloo.ca	Dept 2
3	Advisor 3	advisor3@sfu.ca	Dept 3
4	Advisor 4	advisor4@western.ca	Dept 4
5	Advisor 5	advisor5@uoft.ca	Dept 5

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Coop Students

StudentID	Name	Email	Year	NApplications	AdvisorID
1	Student 1	student1@ubc.ca	3	10	1
2	Student 2	student2@waterloo.ca	2	15	2
3	Student 3	student3@sfu.ca	3	12	3
4	Student 4	student4@western.ca	4	20	4
5	Student 5	student5@uoft.ca	2	1	5

Submitted Applications

StudentID	Application ID
1	6
2	7
3	8
4	9
5	10

Reference to Query

1) INSERT

index.html: `<h2>Insert a Student-Application pair (Student and Application ID must both exist) </h2>`

scripts.js: `insertApplication(event)`

appController.js: `/insert-application`

appService.js: `insertApplication(studentID,postingID)`

index.html: `<h2>Insert a Student</h2>`

```
scripts.js: insertStudent(event)
appController.js: /insert-student
appService.js: insertStudent(studentid, name, email, standing,
napplications,boardtitle, advisorid)


index.html: <h2> Insert Values into Job Board </h2>
scripts.js: insertJobBoard(event)
appController.js: /insert-jobboard
appService.js: insertJobBoard(id, company, position, deadline,
term, duration, datePosted, boardTitle)
```

2) **DELETE**
```
index.html: <h2>Remove Job Posting From Job Board (Using
ID)</h2>
scripts.js: removeIDJobBoard(event)
appController.js: /remove-id-jobboard
appService.js: removeIDJobBoard(removeID)
```

3) **UPDATE**
```
index.html: <h2>Update Job Board</h2>
scripts.js: updateJobBoard(event)
appController.js: /update-jobboard
appService.js: updateJobBoard(targetID, targetColumn, newValue)
```

4) **Selection**
```
index.html: <h2>Search Jobs</h2>
scripts.js:searchJobBoard(event)
appController.js:/search-jobboard
appService.js:searchJobBoardFromDb(query)
```

5) **Projection**
```
index.html: <h2> Filter Job Board (Please enter as a comma
separated list) </h2>
scripts.js: filterJobBoard(event)
appController.js: /filter-jobboard
appService.js: filterJobBoard(columnNames)
```

6) **Join**
```
index.html: <h2 id="title">Find Students' information who
applied to a specific Job</h2>
scripts.js: fetchAndDisplayJoin()
```

appController.js: `/join-jobboard`
appService.js: `fetchJoinBoardFromDb(postingID)`

7) **Aggregation with Group By**

   index.html: `<h2>Count how many Jobs are being Offered by Each Company</h2>`

   scripts.js: `countJobBoard()`
   appController.js: `/count-jobboard`
   appService.js: `countJobBoard()`

8) **Aggregation with Having**

   index.html: `<h2>Which Companies offer jobs that are at least ___ months long</h2>`

   scripts.js: `countHavingJobBoard(event)`
   appController.js: `counthaving-jobboard`
   appService.js: `countHavingJobBoard(months)`

9) **Nested Aggregation with Group By**

   index.html: `<h2>Find the average number of Applications submitted per Student for each Department that has at least 2 students in the Department</h2>`

   scripts.js: `fetchAndDisplayNested()`
   appController.js: `/nestedGroup-jobboard`
   appService.js: `countNestedGroup()`

10) **Division**

   index.html: `<h2>Find Students who have applied to all Jobs</h2>`
   scripts.js: `divideJobBoard()`
   appController.js: `/divide-jobboard`
   appService.js: `fetchDivideBoardFromDb()`

Queries: INSERT

Inserting into Submitted Applications table:

Insert a Student-Application pair (Student and Application ID must both exist)

Student ID: [Enter Student ID]

Application ID: [Enter Application ID]

[Insert]

USER INPUTS: Student ID = 4, Application ID = 10

BEFORE QUERY:

Submitted Applications

StudentID	Application ID
1	8
1	9
1	10
2	8
2	9
2	10
3	8
3	9
4	9
5	10

AFTER QUERY:

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Submitted Applications

StudentID	Application ID
1	8
1	9
1	10
2	8
2	9
2	10
3	8
3	9
4	9
4	10
5	10

Inserting into Coop Students table:

Insert a Student

Student ID: `Enter Student ID`

Name: `Enter Student Name`

Email: `Enter Student Email`

Standing: `Enter Student Year`

Number of Applications: `Enter Student ID`

Advisor ID: `Enter Advisor ID`

Insert

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USER INPUTS: Student ID = 20, Name = Demo, Email = demo@ubc.ca, Standing = 3, Number of Applications = 6, Advisor ID = 3

BEFORE QUERY:

Coop Students

StudentID	Name	Email	Year	NApplications	AdvisorID
1	Student 1	student1@ubc.ca	3	10	1
2	Student 2	student2@waterloo.ca	2	15	2
3	Student 3	student3@sfu.ca	3	12	3
4	Student 4	student4@western.ca	4	20	4
5	Student 5	student5@uoft.ca	2	1	5
17	a	a	1	1	1
6	Student 6	student6@ubc.ca	2	5	1
7	Student 7	student7@ubc.ca	3	8	2
8	Student 8	student8@ubc.ca	4	12	3
9	Student 9	student9@ubc.ca	3	10	4
10	Student 10	student10@ubc.ca	2	7	5
13	Student 13	student13@sfu.ca	3	8	3
14	Student 14	student14@sfu.ca	4	15	3
15	Student 15	student15@uoft.ca	2	4	4
16	Student 16	student16@uoft.ca	3	7	4

AFTER QUERY:

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Coop Students

StudentID	Name	Email	Year	NApplications	AdvisorID
1	Student 1	student1@ubc.ca	3	10	1
2	Student 2	student2@waterloo.ca	2	15	2
3	Student 3	student3@sfu.ca	3	12	3
4	Student 4	student4@western.ca	4	20	4
5	Student 5	student5@uoft.ca	2	1	5
17	a	a	1	1	1
6	Student 6	student6@ubc.ca	2	5	1
7	Student 7	student7@ubc.ca	3	8	2
8	Student 8	student8@ubc.ca	4	12	3
9	Student 9	student9@ubc.ca	3	10	4
10	Student 10	student10@ubc.ca	2	7	5
13	Student 13	student13@sfu.ca	3	8	3
14	Student 14	student14@sfu.ca	4	15	3
15	Student 15	student15@uoft.ca	2	4	4
16	Student 16	student16@uoft.ca	3	7	4
20	Demo	demo@ubc.ca	3	6	3

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Inserting into Coop Job Board:

Insert Values into Job Board

ID: ▢ ID

Company: ▢ Company

Position: ▢ Position

Deadline: ▢ 2023-12-03

Term:
- ○ Winter
- ○ Spring
- ○ Summer

Duration:
- ○ 4
- ○ 8
- ○ 12

[**Insert**]

USER INPUTS/SELECTS: ID = 15, Company = Company 1, Position = Data Analyst, Deadline = 2023-12-22, Term = Winter, Duration = 8

BEFORE QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26

AFTER QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
15	Company 1	Data Analyst	2023-12-22	Winter	8	2023-12-04

Queries: DELETE

Remove Job Posting From Job Board (Using ID)

ID: [Enter ID ⇕]

[**Remove**]

USER INPUTS: ID = 15

BEFORE QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
15	Company 1	Data Analyst	2023-12-22	Winter	8	2023-12-04

AFTER QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26

Queries: UPDATE

Update Job Board

Target ID: [Enter target ID]

Which column would you like to update?: [eg. Position]

What value would you like to update with?: [Enter New Value]

[Update]

USER INPUTS: Target ID = 15, Column = Position, Update with = QA Tester

BEFORE QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
15	Company 1	Data Analyst	2023-12-22	Winter	8	2023-12-04

AFTER QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
15	Company 1	QA Tester	2023-12-22	Winter	8	2023-12-04

Queries: Selection

BEFORE QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
20	Company 2	Product Manager	2023-12-01	Spring	4	2023-12-04
21	Company 2	IT Specialist	2023-12-01	Spring	4	2023-12-04

AFTER QUERY:

Please enter in Query Options:

(CompanyName = 'Company 2') OR (CompanyName = 'Company 3') OR (CompanyName = 'Company 4')

| company | = | 'Company 4' | | Build | | AND |

| OR | | Reset | | Search |

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
20	Company 2	Product Manager	2023-12-01	Spring	4	2023-12-04
21	Company 2	IT Specialist	2023-12-01	Spring	4	2023-12-04

Queries: Projection

Filter Job Board (Please enter as a comma separated list)

What column would you like to filter on?: `Company, Position`

[Filter]

USER INPUTS: Position, Term, Duration

BEFORE QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
15	Company 1	QA Tester	2023-12-22	Winter	8	2023-12-04

AFTER QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
		IT Consultant		Summer	4	
		Product Manager		Summer	4	
		Software Developer		Spring	8	
		QA Tester		Winter	8	

Queries: Join

Find Students' information who applied to a specific Job

Job Posting ID: [Enter ID   ⇕]

[Search]

Students who applied to the specified Job Posting:

StudentID	Name	NApplications

USER INPUTS: Job Posting ID = 10

BEFORE QUERIES:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
15	Company 1	QA Tester	2023-12-22	Winter	8	2023-12-04

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Coop Students

StudentID	Name	Email	Year	NApplications	AdvisorID
1	Student 1	student1@ubc.ca	3	10	1
2	Student 2	student2@waterloo.ca	2	15	2
3	Student 3	student3@sfu.ca	3	12	3
4	Student 4	student4@western.ca	4	20	4
5	Student 5	student5@uoft.ca	2	1	5
17	a	a	1	1	1
6	Student 6	student6@ubc.ca	2	5	1
7	Student 7	student7@ubc.ca	3	8	2
8	Student 8	student8@ubc.ca	4	12	3
9	Student 9	student9@ubc.ca	3	10	4
10	Student 10	student10@ubc.ca	2	7	5
13	Student 13	student13@sfu.ca	3	8	3
14	Student 14	student14@sfu.ca	4	15	3
15	Student 15	student15@uoft.ca	2	4	4
16	Student 16	student16@uoft.ca	3	7	4
20	Demo	demo@ubc.ca	3	6	3

Submitted Applications

StudentID	Application ID
1	8
1	9
1	10
2	8
2	9
2	10
3	8
3	9
4	9
4	10
5	10

AFTER QUERY:

Students who applied to the specified Job Posting:

StudentID	Name	NApplications
1	Student 1	10
2	Student 2	15
4	Student 4	20
5	Student 5	1

Queries: Aggregation with Group By

Count how many Jobs are being Offered by Each Company

[Count]

Company	Jobs Offered

BEFORE QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
20	Company 2	Product Manager	2023-12-01	Spring	4	2023-12-04
21	Company 2	IT Specialist	2023-12-01	Spring	4	2023-12-04
22	Company 5	Data Analyst	2024-01-12	Summer	4	2023-12-04

AFTER QUERY:

Company	Jobs Offered
Company 4	1
Company 5	2
Company 2	3

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Queries: Aggregation with Having

Which Companies offer jobs that are at least ___ months long

Minimum Duration of Months?: [eg. 4,8,12]

Search

Company

USER INPUTS: Min Duration = 8

BEFORE QUERY:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26
20	Company 2	Product Manager	2023-12-01	Spring	4	2023-12-04
21	Company 2	IT Specialist	2023-12-01	Spring	4	2023-12-04

AFTER QUERY:

Company
Company 5

Queries: Nested Aggregation with Group By

Find the average number of Applications submitted per Student for each Department that has at least 2 students in the Department

[Count]

BEFORE QUERIES:

Coop Advisors

AdvisorID	Name	Email	Department
1	Advisor 1	advisor1@ubc.ca	Dept 1
2	Advisor 2	advisor2@waterloo.ca	Dept 2
3	Advisor 3	advisor3@sfu.ca	Dept 3
4	Advisor 4	advisor4@western.ca	Dept 4
5	Advisor 5	advisor5@uoft.ca	Dept 5

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Coop Students

StudentID	Name	Email	Year	NApplications	AdvisorID
1	Student 1	student1@ubc.ca	3	10	1
2	Student 2	student2@waterloo.ca	2	15	2
3	Student 3	student3@sfu.ca	3	12	3
4	Student 4	student4@western.ca	4	20	4
5	Student 5	student5@uoft.ca	2	1	5
17	a	a	1	1	1
6	Student 6	student6@ubc.ca	2	5	1
7	Student 7	student7@ubc.ca	3	8	2
8	Student 8	student8@ubc.ca	4	12	3
9	Student 9	student9@ubc.ca	3	10	4
10	Student 10	student10@ubc.ca	2	7	5
13	Student 13	student13@sfu.ca	3	8	3
14	Student 14	student14@sfu.ca	4	15	3
15	Student 15	student15@uoft.ca	2	4	4
16	Student 16	student16@uoft.ca	3	7	4
20	Demo	demo@ubc.ca	3	6	3

AFTER QUERY:

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Department	NApplications
Dept 4	10.25
Dept 1	5.3333333333333295
Dept 5	4
Dept 3	10.6
Dept 2	11.5

Queries: Division

Find Students who have applied to all Jobs

Find Student

[Search]

Student Names

BEFORE QUERIES:

Coop Job Board

ID	Company	Position	Deadline	Term	Duration	Date Posted
8	Company 2	IT Consultant	2024-10-27	Summer	4	2023-10-29
9	Company 4	Product Manager	2024-01-18	Summer	4	2023-10-22
10	Company 5	Software Developer	2024-2-14	Spring	8	2023-11-26

Submitted Applications

StudentID	Application ID
1	8
1	9
1	10
2	8
2	9
2	10
3	8
3	9
4	9
4	10
5	10

AFTER QUERY:

Student Names
Student 1
Student 2