Faculty of Engineering and Computer Science
Expectations of Originality

This form sets out the requirements for originality for work submitted by students in the Faculty of Engineering and Computer Science. Submissions such as assignments, lab reports, project reports, computer programs and take-home exams must conform to the requirements stated on this form and to the Academic Code of Conduct. The course outline may stipulate additional requirements for the course.

1. Your submissions must be your own original work. Group submissions must be the original work of the students in the group.
2. Direct quotations must not exceed 5% of the content of a report, must be enclosed in quotation marks, and must be attributed to the source by a numerical reference citation[1]. Note that engineering reports rarely contain direct quotations.
3. Material paraphrased or taken from a source must be attributed to the source by a numerical reference citation.
4. Text that is inserted from a web site must be enclosed in quotation marks and attributed to the web site by numerical reference citation.
5. Drawings, diagrams, photos, maps or other visual material taken from a source must be attributed to that source by a numerical reference citation.
6. No part of any assignment, lab report or project report submitted for this course can be submitted for any other course.
7. In preparing your submissions, the work of other past or present students cannot be consulted, used, copied, paraphrased or relied upon in any manner whatsoever.
8. Your submissions must consist entirely of your own or your group's ideas, observations, calculations, information and conclusions, except for statements attributed to sources by numerical citation.
9. Your submissions cannot be edited or revised by any other student.
10. For lab reports, the data must be obtained from your own or your lab group's experimental work.
11. For software, the code must be composed by you or by the group submitting the work, except for code that is attributed to its sources by numerical reference.

You must write one of the following statements on each piece of work that you submit:
For individual work: **"I certify that this submission is my original work and meets the Faculty's Expectations of Originality",** with your signature, I.D. #, and the date.
For group work: **"We certify that this submission is the original work of members of the group and meets the Faculty's Expectations of Originality",** with the signatures and I.D. #s of all the team members and the date.

A signed copy of this form must be submitted to the instructor at the beginning of the semester in each course.

I certify that I have read the requirements set out on this form, and that I am aware of these requirements. I certify that all the work I will submit for this course will comply with these requirements and with additional requirements stated in the course outline.

Course Number:	Comp 353	Instructor:	Prof. Khaled Jababo
Name:	Andre Hei Wang Law	I.D. #	4017 5600
Signature:	[illegible]	Date:	2023-07-22

[1] Rules for reference citation can be found in "Form and Style" by Patrich MacDonagh and Jack Bordan, fourth edition, May, 2000, available at http://www.encs.concordia.ca/scs/Forms/Form&Style.pdf.
Approved by the ENCS Faculty Council February 10, 2012

Andre Hei Wang Law

4017 5600

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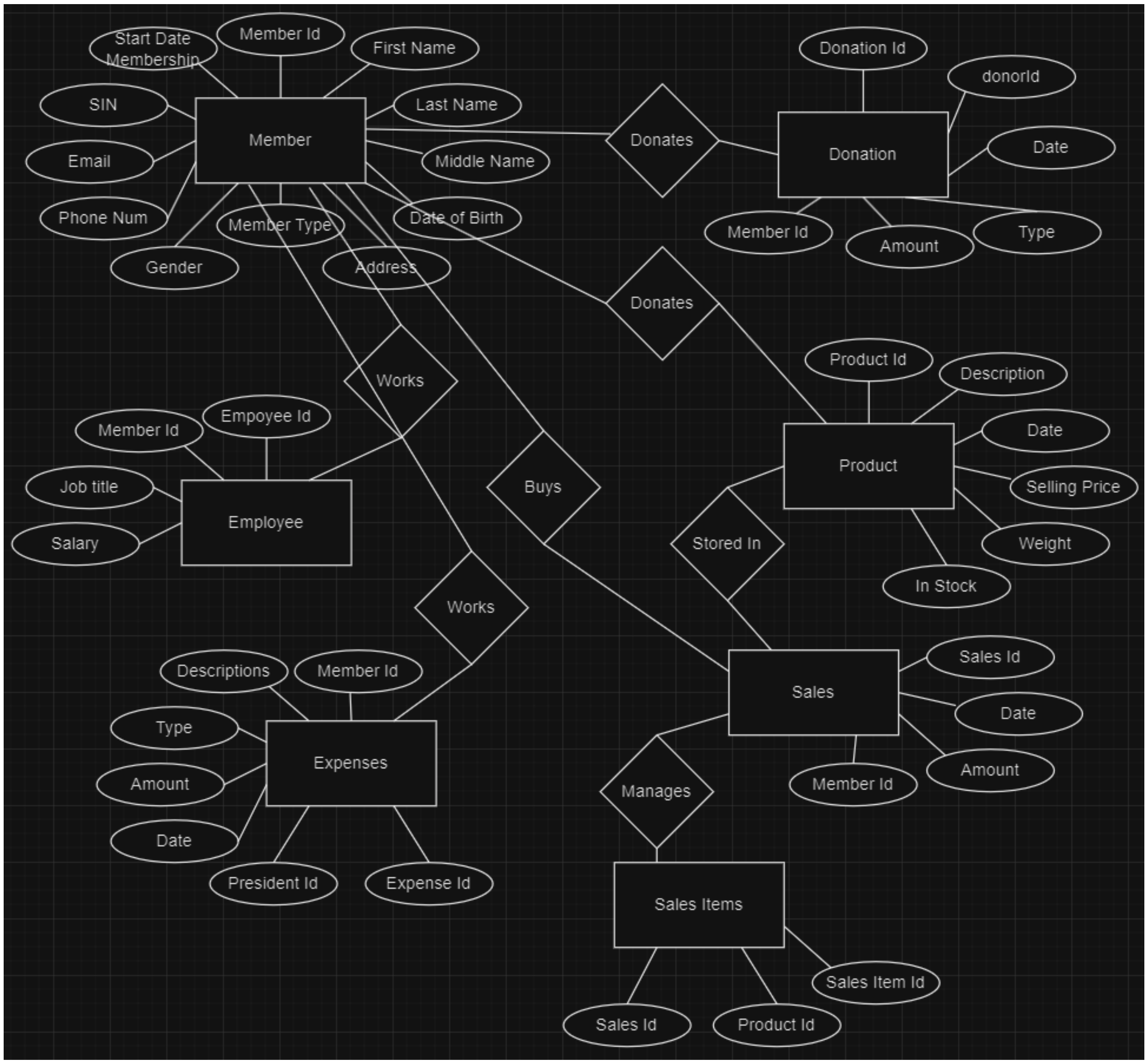
Comp 353 – Assignment 2

PART I:

a) ER Diagram



b) Constraints Not Captured by ER Diagram

Primary Keys:

-Member Id

-Donation Id

-Product Id

-Sales Id

-Sales Items Id

-Employee Id

-Expenses Id

Foreign Keys:

-In Donation, Member Id references to Member Id from Member

(Member Id here is the same as Donor Id)

-In Sales, Member Id references to Member Id from Member

-In Sales Items, Product Id references to Product Id from Product

-In Sales Items, Sales Id references to Sales Id from Sales

-In Expenses, President Id references to Member Id from Member

-In Expenses, Member Id references to Member Id from Member

-In Employee, Member Id references to Member Id from Member

Cardinalities:

One Member(donor) can make multiple Donations (1-to-many)

One Member(donor) can donate multiple Products (1-to-many)

One Member(client) can buy multiple Sales (1-to-many)

One Sale can have multiple Sales Items (1-to-many)

One Employee(employee) works as one Member (1-to-1)

One Member(president) can have many Expenses (1-to-many)

Many Products can be stored into one Sales (many-to-1)

c) Relational Database Scheme

Member	
memberId (PK)	INT
firstName	VARCHAR(255)
lastName	VARCHAR(255)
middleName	VARCHAR(255)
dateOfBirth	DATE
address	VARCHAR(255)
memberType	ENUM(‘client’, ‘employee’, ’donor’)
gender	VARCHAR(255)
phoneNumber	VARCHAR(255)
email	VARCHAR(255)
socialInsuranceNumber	VARCHAR(255)
startDateMembership	DATE

Donation	
donationId (PK)	INT
donarId	INT
date	DATE
type	ENUM(‘product’, ‘money’)
amount	INT
memberId (FK)	INT

Product	
productId (PK)	INT
description	VARCHAR(255)
date	DATE
sellingPrice	INT
weight	FLOAT
inStock	BOOLEAN

Sales	
salesId (PK)	INT
date	DATE
amount	INT
memberId (FK)	INT

Sales Items	
salesItemId (PK)	INT
productId (FK)	INT
salesId (FK)	INT

Expenses	
expenseId (PK)	INT
presidentId	INT
date	DATE
amount	INT
type	ENUM(‘rent’, ‘bill’, ‘charity’)
description	VARCHAR(255)
memberId (FK)	INT

Employee	
employeeId (PK)	INT
jobTitle	ENUM(‘president’, ‘vice-president’, ‘cashier’, ‘other’)
salary	INT
memberId (FK)	INT

d) Changed Design – President and Vice-President Approval

If we need the approval of both the president and the vice president of the organization, we would need to change the Expenses table. Rather than President Id, it would be Approver Id. This means, this stores the Id of the person who approved of the expense. In this case, we can have it referenced as a foreign key to Member table which needs access to Employee. This is due to the fact that Employee tables stores the Job Title of the member which includes President and Vice President.

PART II:

a)

```
SELECT
    m.memberId,
    m.firstName,
    m.lastName,
    m.middleName,
    m.dateOfBirth,
    m.address,
    m.gender,
    m.phoneNumber,
    m.email,
    m.socialInsuranceNumber,
    m.startDateMembership,
    e.jobTitle
FROM
    Member m -- 'Member' as 'm'
JOIN
    Employee e ON m.memberId = e.memberId -- 'Employee' as 'e' on
matching member ID
WHERE
    m.memberType = 'client' AND-- select members with a memberType of
'client'
    m.memberId IN ( -- filter members
        SELECT memberId
           FROM Donation -- retrieve member IDs from the table
'Donation'
        INTERSECT -- INTERSECT operator, combine the results
        SELECT memberId
           FROM Employee -- retrieve member IDs from the table
'Employee'
           WHERE salary IS NULL OR salary = 0 -- salary is NULL or 0
    );
```

b)

```
SELECT
    e.expenseId,
    m.firstName,
    m.lastName,
    e.date,
    e.amount,
    e.type,
    e.description
```

```
FROM
    Expenses e -- 'Expenses' as 'e'
JOIN
    Member m ON e.presidentId = m.memberId -- 'Member' as 'm' on
matching president IDs
WHERE
    EXTRACT(MONTH FROM e.date) = 6 AND-- filter, result in the month
of June = 6
    EXTRACT(YEAR FROM e.date) = 2023; -- filter, result from the year
2023
```

c)

```
SELECT
    s.salesId,
    s.date,
    m.firstName,
    m.lastName,
    p.description,
    p.sellingPrice,
    p.weight
FROM
    Sales s      -- 'Sales' as 's'
JOIN
    Member m ON s.memberId = m.memberId -- 'Member' as 'm' on matching
member IDs
JOIN
    SalesItems si ON s.salesId = si.salesId -- 'SalesItems' as 'si' on
matching Sales IDs
JOIN
    Product p ON si.productId = p.productId -- 'Product' as 'p' on
matching Product IDs
WHERE
    EXTRACT(MONTH FROM s.date) = 6 AND -- filter, result in the month
of June = 6
    EXTRACT(YEAR FROM s.date) = 2023 AND -- filter, result from the
year 2023
    m.address LIKE '%Brossard%' -- filter, result containing
'Brossard'
ORDER BY
    s.salesId ASC, m.firstName ASC, m.lastName ASC, p.weight ASC; --
order
```

d)

```
SELECT
    s.salesId,
    s.date,
    p.description,
    p.sellingPrice,
    p.weight
FROM
    Sales s -- 'Sales' as 's'
JOIN
    SalesItems si ON s.salesId = si.salesId -- 'SalesItems' as 'si' on
matching Sales IDs
JOIN
    Product p ON si.productId = p.productId -- 'Product' as 'p' on
matching Product IDs
WHERE
    EXTRACT(MONTH FROM s.date) = 6 AND -- filter, result in the month
of June = 6
     EXTRACT(YEAR FROM s.date) = 2023 AND-- filter, result from the
year 2023
    NOT EXISTS (-- filter based on abscence
        SELECT 1      -- placeholder, return value 1
           FROM Member m
        WHERE s.memberId = m.memberId AND
           m.memberType = 'client'     -- member is a client that
purchased the product
    )
ORDER BY
    s.salesId ASC, p.sellingPrice ASC;
```

e)

```
SELECT
    m.firstName,
    m.lastName,
    MIN(s.date) AS firstSaleDate,
    MAX(s.date) AS lastSaleDate,
    SUM(s.amount) AS totalAmountOfSales          -- total
FROM
    Member m
JOIN
    Sales s ON m.memberId = s.memberId -- 'Sales' as 's' on matching
Mamber IDs
WHERE
    m.memberType = 'client'-- member is a client that purchased the
product
```

```
GROUP BY
    m.memberId, m.firstName, m.lastName
HAVING
    SUM(s.amount) >= 1000  -- at least 1000$
ORDER BY
    totalAmountOfSales;          -- sort based on total
```