

COMP 353 FINAL REPORT

Submitted to
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COMP 353-2182-F
2018-02-12

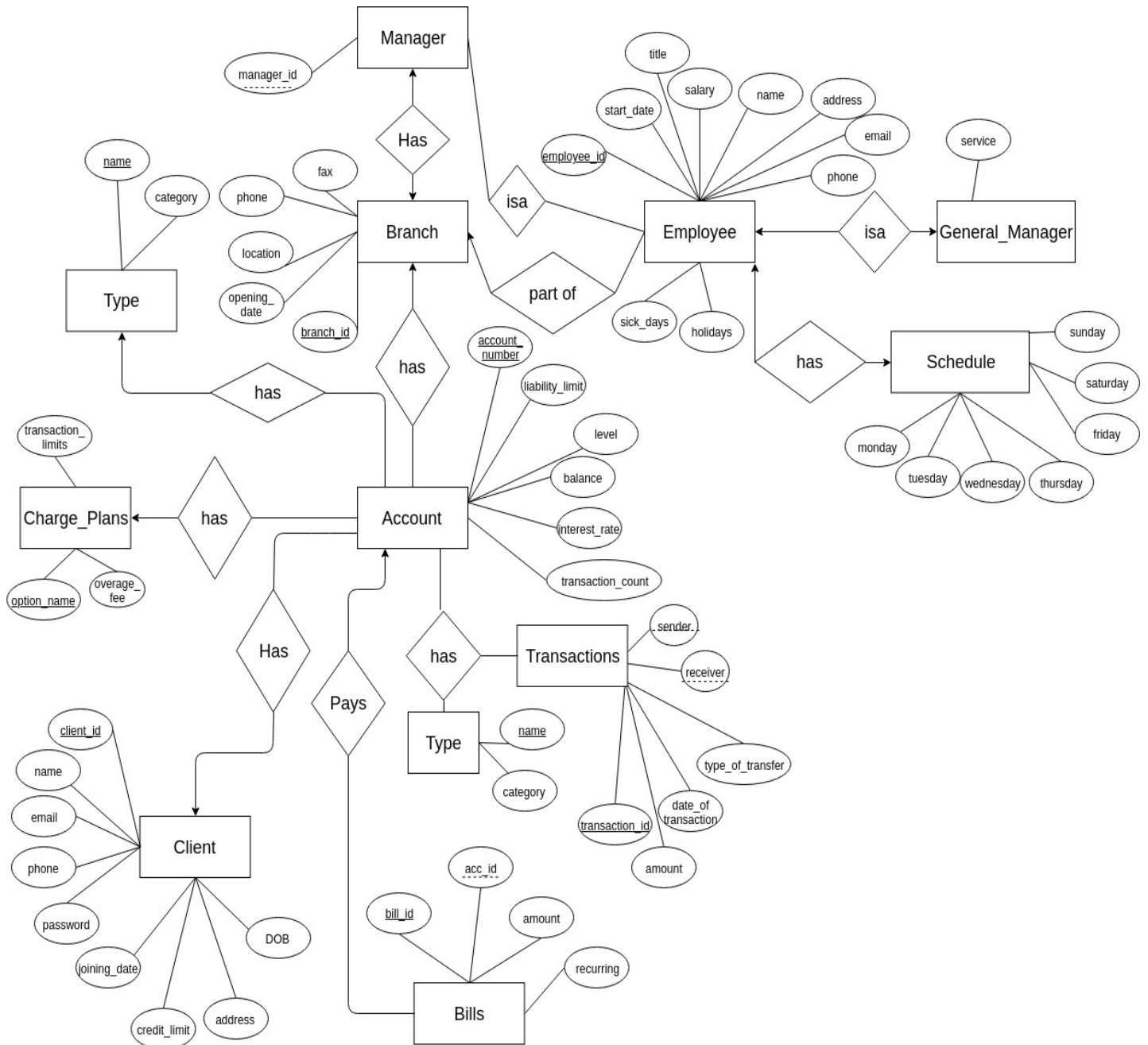
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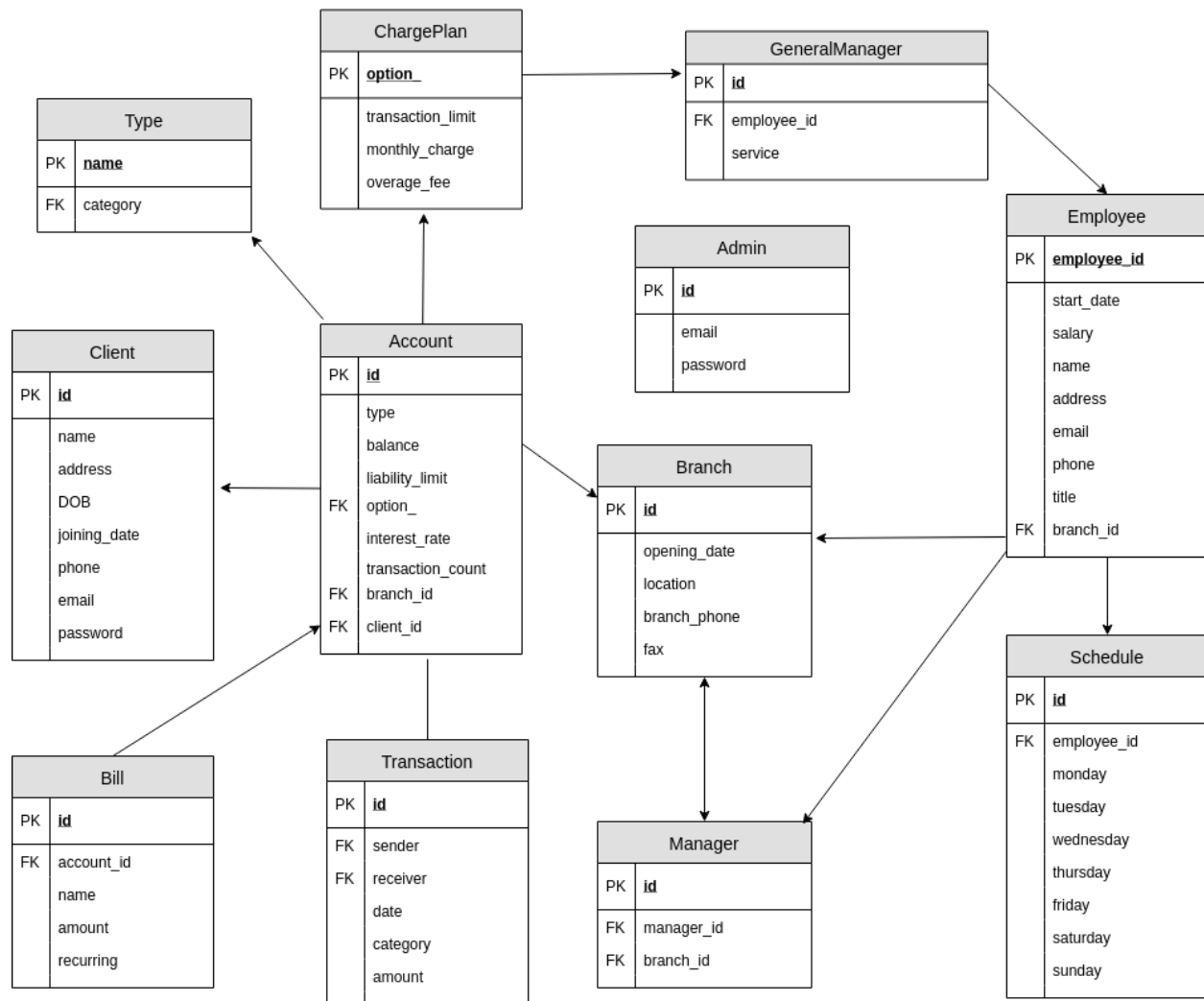
Group ID: eec353_2

Concordia University
Dept.of Computer Science
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E/R MODEL



Relational Model in 3NF



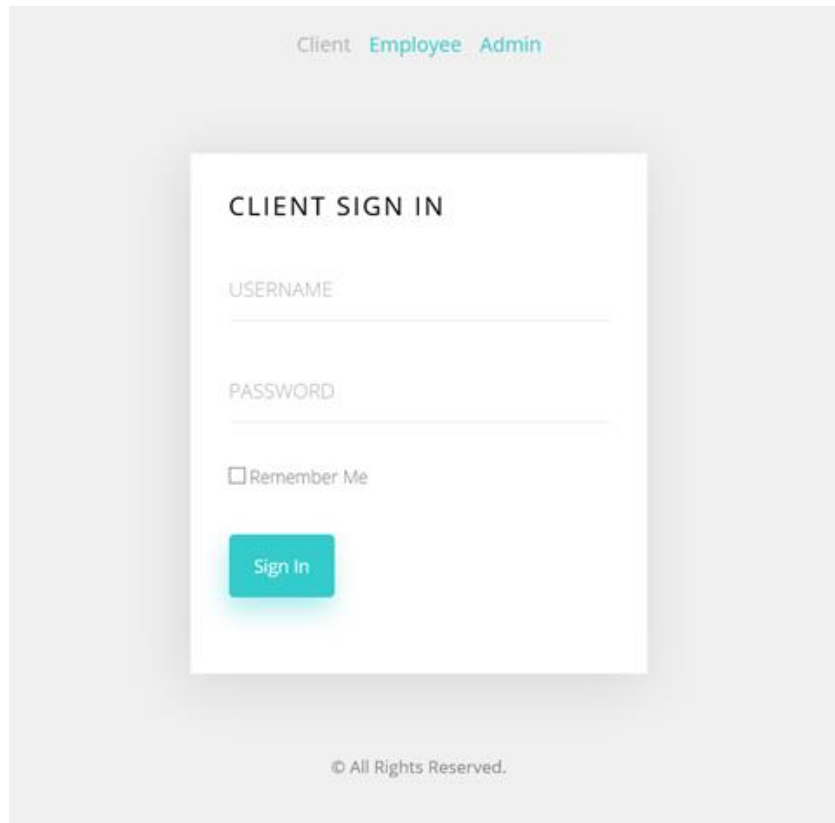
Our current model is a completely new design in comparison to our warm-up project because we felt our original design was heavily lacking in its ability to be implemented. We took into account the comments by the TA in order to make the system adequately fit the requirements. Since then, our knowledge about database organization and design has increased significantly which has resulted in a full redesign and implementation. We disregarded our warm-up project entirely while redesigning this database schema.

Assumptions

1. All employees have a set shift from 9am to 5pm. They either work on a given day or do not.
2. All branches provide all services.
3. Overage fee is charged on a flat rate monthly basis if transaction limit is exceeded not per transaction.
4. There exists an admin account that has the power to edit/delete and access all database tables and information
5. E-transfers are made to the first available receiver account as real life e-transfers require 2FA authentication and that is outside the scope of this project.
6. Transactions are made from one account to another. In the case of billing, there is a billing account which exists solely to accumulate bill payments made by all clients. The reason for this is because in order to satisfy the requirement of having multiple bills count as one transaction, they must necessarily only have one receiving account. In real life however, billing transactions are not logged as a single transaction, rather they are separate transactions to separate accounts but may be counted as a single transaction in terms of fees.
7. Credit card limits are arbitrarily inserted as clients may have different rules applied to them based on their previous banking history and extraneous factors (eg. credit score at other banks, utility payments etc.)

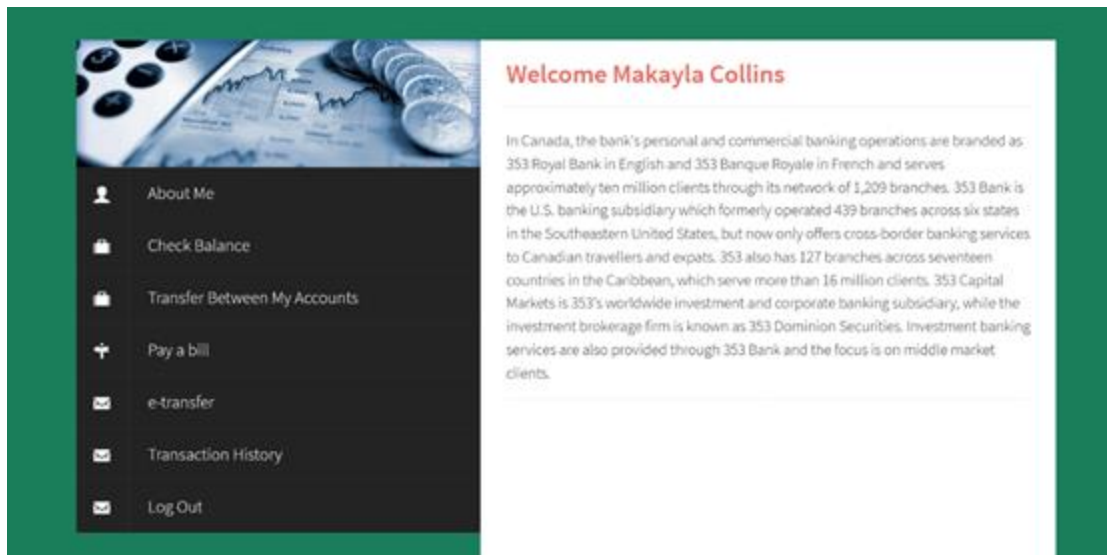
User Guide

1. Sign In Page

A screenshot of a web application's sign-in page. At the top, there are three links: 'Client', 'Employee', and 'Admin', with 'Employee' highlighted in teal. Below these links is a white rectangular form titled 'CLIENT SIGN IN'. The form contains two input fields: 'USERNAME' and 'PASSWORD', each with a horizontal line for text entry. Below the password field is a checkbox labeled 'Remember Me'. At the bottom of the form is a teal button with the text 'Sign In'. The entire form is centered on a light gray background. At the very bottom of the gray background, there is a small copyright notice: '© All Rights Reserved.'

- In this page client and Employee can sign in with their ID and password. Admin account can be signed in by Email and password.
- Simply click the button in the top can switch the sign in page to different user.

2. Client Page



Application Included:

- **About Me — Check and edit client information**

Profile

100019

Client ID

100019

Name

Makayla Collins

Address

6044-York Road

Date of Birth

1953-07-10

Email Address

makaylacollins154@gmail.com

Phone Number

9310051654

[Edit](#)

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- **Check Balance — See details of the client's account(number, balance..) and move money within accounts.**

Balance

Client ID	Type	Level	Option	Account Number	Balance
100019	checking	business	professional	200000	51779.00
100019	credit	business	none	200001	-354.00
100019	loan	corporate	none	200005	-240079.00
100019	loan	corporate	none	200014	-6847.00
100019	credit	corporate	none	200015	-318.00
100019	checking	corporate	professional	200043	149509.00

[Move money](#)

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- **Transfer Between My Accounts—Move money within accounts.**
- **Pay a bill — Pay a bill instantly or set regular payment.**

Pay a bill

From

200000

To(Payee)

Name

Amount

0

[Pay Now](#)

[Pay Monthly](#)

[Check Banlance](#)

[Back to Home](#)

- **E-Transfer — Send money to other clients by using email or phone number.**

e-Transfer

From

200000

To(email/phone)

0

Amount

0

[Transfer](#)

[Check Banlance](#)

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- **Transaction—View the transaction within 10 years. Any e-transfer or pay bill will be added into the transaction history.**

Transaction History

#	Send from Account	Receiver Account	Date	category	Amount
0	200000	200003	2017-04-22	bill	1333
1	200001	200004	2018-03-24	bill	8421
2	200005	200028	2012-07-25	bill	922.22
3	200014	200009	2010-08-25	bill	2870.01
4	200015	200010	2018-05-22	bill	7705.7
5	200043	200037	2011-09-21	transfer	773

[Move money](#)
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3.Employee Page





Hi


The word "Bank" is of Italian origin. Word banco (translated from Italian bench, table) in the XV-XVI centuries in the Venetian Republic was called the benches on which the money-changers and usurers were put coins and business papers. If the Jew was bankrupt and could not pay money for its payment obligations, then this bench was broken on his head.


In medieval Europe, the Roman Popes were strictly forbidden to lend money at interest to cash in on the financial difficulties of faith was considered a terrible sin. Therefore, in 1179, Pope Alexander III declared moneylenders hardened sinners and was forbidden to admit them to communion. In addition, the so-called "bankers" were not allowed to be buried on consecrated ground, so they, like suicide, was buried outside the fence of the cemetery.

 Personal Information

 Work Information

 Create client account

 Delete client account

 Log Out

Application Included:

- **Personal Information—Check and edit employee information**

Profile

employee ID

300000

Name

Christian Martinez

Address

2916 Glenwood Drive

Email Address

christianmartinez371@gmail.com

Phone Number

9643367856

Title

Teller

[Edit Profile](#)

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- **Work Information—check work information (salary, schedule, branch id...)**

Work Information						
Name	Start Date	Title	Monthly Pay	Sick Days	Holidays	Branch
Christian Martinez	2009-12-23	Teller	4196	10	14	5

Monthly pay
4196\$

Branch Information
Location: Vancouver
Phone: 4674818994
Fax: 6555318761

- **Create client account—create accounts for clients by entering corresponding information**

Bank System

Create Client Account

Client

ID

Type

Level

Charge Plans

Interest Rate

Branch

[Create](#)

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- **Delete client account—delete accounts for clients by entering corresponding information**

Bank System

Delete Client Account

Account ID

200012

Client

Angel Adams

Delete

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4. Admin page



The admin page features a green sidebar on the left with a dark menu containing the following items:

- Employee Information
- Create employee account
- Delete client account
- Log Out

The main content area has a white background with a green header. It includes a greeting "Hi Admin" and a paragraph of text about the history of the word "Bank".

Hi Admin

The word "Bank" is of Italian origin. Word banco (translated from Italian bench, table) in the XV-XVI centuries in the Venetian Republic was called the benches on which the money-changers and usurers were put coins and business papers. If the Jew was bankrupt and could not pay money for its payment obligations, then this bench was broken on his head.

In medieval Europe, the Roman Popes were strictly forbidden to lend money at interest to cash in on the financial difficulties of faith was considered a terrible sin. Therefore, in 1179, Pope Alexander III declared moneylenders hardened sinners and was forbidden to admit them to communion. In addition, the so-called "bankers" were not allowed to be buried on consecrated ground, so they, like suicide, was buried outside the fence of the cemetery.

Application Included:

- **Employees Information—View and edit all employees' information. And also delete employee from the database.**

Employees

Employee ID	Title	Name	Start Date	Email	Phone	Address	# of Sick Days	# of Holidays	Monthly pay	Branch		
111111	President	Robert Flechly	2000-10-12	robertflechly222@gmail.com	4416246539	2006- Lantern Lane	10	14	2952\$	1	Edit	Delete
300000	Teller	Christian Martinez	2009-12-23	christianmartinez871@gmail.com	9643387856	2918- Glenwood Drive	10	14	4196\$	5	Edit	Delete
300001	Teller	Zoey Young	2003-01-12	zoeyyoung583@gmail.com	4427261019	8167- Garfield Avenue	10	14	9465\$	5	Edit	Delete
300002	Teller	Alexa Harris	2009-09-13	alexaharris864@gmail.com	6213300554	3726-8th Street West	10	14	3863\$	4	Edit	Delete
300003	Teller	Hannah Carter	2007-04-20	hannahcarter567@gmail.com	4579700929	9150-Warren Street	10	14	3435\$	3	Edit	Delete
300004	Teller	James Harris	2015-01-12	jamesharris232@gmail.com	6239980616	8973-Broad Street	10	14	3055\$	4	Edit	Delete
300005	Teller	Taylor Anderson	2014-12-27	tayloranderson721@gmail.com	5657130314	613- Broadway	10	14	2295\$	5	Edit	Delete
300006	Teller	Alexis Evans	2009-09-25	alexisevans1@gmail.com	2873945240	8830-Broad Street	10	14	8655\$	1	Edit	Delete
300007	Teller	Layla Lewis	2017-02-14	laylalewis826@gmail.com	4325570734	8863- Washington Avenue	10	14	8185\$	5	Edit	Delete
300008	Teller	Zoey King	2014-01-10	zoeyking765@gmail.com	8489232545	5300-Pin Oak Drive	10	14	9420\$	5	Edit	Delete
300009	Teller	James Collins	2018-09-14	jamescollins142@gmail.com	3740143730	6597-Elm Avenue	10	14	5983\$	4	Edit	Delete
300010	Teller	Makayla Jackson	2014-08-12	makaylajackson658@gmail.com	5226483221	1933-Fawn Court	10	14	4694\$	1	Edit	Delete

- **Create Employee account—Create account for employees by corresponding information**

Bank System

Create Employee

Employee ID

Start Date

Name

Address

Email

Phone

Title

Monthly Pay

Sick Days

Holidays

Password

Branch

[Create](#)

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Note: The UI of Signin and userpage are modified from templates of this website: <http://www.cssmoban.com/>. Others are done by ourselves by using bootstrap.

Refinement and Future Work

1. Add forgotten constraints that allow insertion and deletion.

Modify the foreign key constraints add “on delete cascade on update cascade”;

```
alter table Manager add foreign key(manager_id) references Employee(id);
alter table Employee add foreign key(branch_id) references Branch(id) on delete cascade on update cascade;
alter table Manager add foreign key (branch_id) references Branch(id) on delete cascade on update cascade;

alter table GeneralManager add foreign key(employee_id) references Employee(id) on delete cascade on update cascade;

alter table Account add foreign key (client_id) references Client(id) on delete cascade on update cascade;
alter table Account add foreign key (branch_id) references Branch(id) on delete cascade on update cascade;
alter table Account add foreign key (type_) references Type(name) on delete cascade on update cascade;
alter table Account add foreign key (option_) references ChargePlan(option_) on delete cascade on update cascade;

alter table Transaction add foreign key (sender) references Account(id) on delete cascade on update cascade;
alter table Transaction add foreign key (receiver) references Account(id) on delete cascade on update cascade;
alter table Schedule add foreign key(employee_id) references Employee(id) on delete cascade on update cascade;
```

2. Set limit for transfer money.

Before transfer money check the liability limit as well. If (balance-transfer amount)>liability limit then do the update.

```
if(!empty($_POST['from'])&&!empty($_POST['to'])&&!empty($_POST['amount'])) {
    echo $_POST['from'];
    echo $_POST['to'];
    echo $_POST['amount'];
    $records = $db->prepare('update account set balance=balance+:transfer_amount where id=:account_number1
    update account set balance=balance-:transfer_amount where id=:account_number1
    and (balance-:transfer amount)>liabilite limit;');
    $records->bindParam(':transfer_amount', $_POST['amount']);
    $records->bindParam(':account_number1', $_POST['from']);
    $records->bindParam(':account_number2', $_POST['to']);
    if($records->execute()){
        $message = 'Successful Change!';
    } else {
        $message = "Sorry,Failure!";
    }
}
```

3. Update transaction history when money is moved.

```

if (!empty($_POST['from']) && !empty($_POST['to']) && !empty($_POST['amount'])) {
    echo $_POST['from'];
    echo $_POST['to'];
    echo $_POST['amount'];
    $records = $db->prepare('update account set balance=balance+:transfer_amount where id=:account_number1
    update account set balance=balance-:transfer_amount where id=:account_number1
    and (balance-:transfer_amount)>liability_limit;
    insert into transaction (sender,receiver,date,category,amount)
    (:account_number1,:account_number2,$data,'transfer',:transfer_amount)');
    $records->bindParam(':transfer_amount', $_POST['amount']);
    $records->bindParam(':account_number1', $_POST['from']);
    $records->bindParam(':account_number2', $_POST['to']);
    if($records->execute()){
        $message = 'Successful Change!';
    } else {
        $message = "Sorry,Failure!";
    }
}

```

4. Create basic account for client(Insert into Client table)

```

$records = $db->prepare("insert into Account values(:id, :name, :address, :dob, :join_date, :phone, :email, :password);");
$records->bindParam(':id', $_POST['id']);
$records->bindParam(':name', $_POST['name']);
$records->bindParam(':address', $_POST['address']);
$records->bindParam(':dob', $_POST['dob']);
$records->bindParam(':join_date', $_POST['join_date']);
$records->bindParam(':phone', $_POST['phone']);
$records->bindParam(':email', $_POST['email']);
$records->bindParam(':password', $_POST['password']);
if($records->execute()){
    $message = 'Successful Change!';
} else {
    $message = "Sorry,Failure!";
}

```

DDL codes

See zip

Group Member Roles

Ryan Taylor

- Database design and creation
- Scripts to initialize and maintain consistency of the database
- Team organization
- Report
- E/R model and Relational Model

Collin Zhou

- E/R model and Relational Model
- Database design and creation

Yongxuan Zhang and Vicchika Pou and Roy Saliba

- All the backend by using PHP
- All the User-interface logic and implementation
- Participate in Database design discussion
- Review the sql scripts and correct the errors
- Report writing related to the UI part

Software

Confirmation of Originality

Faculty of Engineering and Computer Science

Course Name & Number/Term: COMP 353 Section: Instructor: Dr. Khaled Jababo
 e.g., SOEN343 e.g. HA

Having prepared this software for submission to the Faculty of Engineering & Computer Science the undersigned certify that the following statements are to the best of my/our knowledge true.

1. The undersigned have written the software myself/themselves and it represents my/our own independent effort and does not copy, or reproduce the work of any other person, except as acknowledged in the references.
2. The undersigned have not used solutions to assignments of other past or present students of this course or any other course in writing this software.
3. This software consists entirely of code written by the undersigned, except for the use of functions and libraries in the public domain all of which, the undersigned has documented as below.
4. The documentation of the software includes a reference to any component that the undersigned did not write myself/themselves.
5. All of the sources that the undersigned consulted while writing this code are listed in the documentation.
6. Each of the undersigned have revised, edited, and proofread this software individually.

Name: <u>Roy Saliba</u> (please print clearly)	ID No: <u>27381751</u>	Signature: 	Date: <u>02/12/2018</u>
Name: <u>Ryan Taylor</u> (please print clearly)	ID No: <u>40008505</u>	Signature: 	Date: <u>02/12/2018</u>
Name: <u>Vicchika Pou</u> (please print clearly)	ID No: <u>40033180</u>	Signature: 	Date: <u>02/12/2018</u>
Name: <u>Yongxuan ZHANG</u> (please print clearly)	ID No: <u>40084728</u>	Signature: 	Date: <u>02/12/2018</u>
Name: <u>Collin Zhou</u> (please print clearly)	ID No: <u>40033295</u>	Signature: 	Date: <u>02/12/2018</u>
Name: <u> </u> (please print clearly)	ID No: <u> </u>	Signature: <u> </u>	Date: <u> </u>