

CPSC 304 Project Cover Page

Milestone #: 2

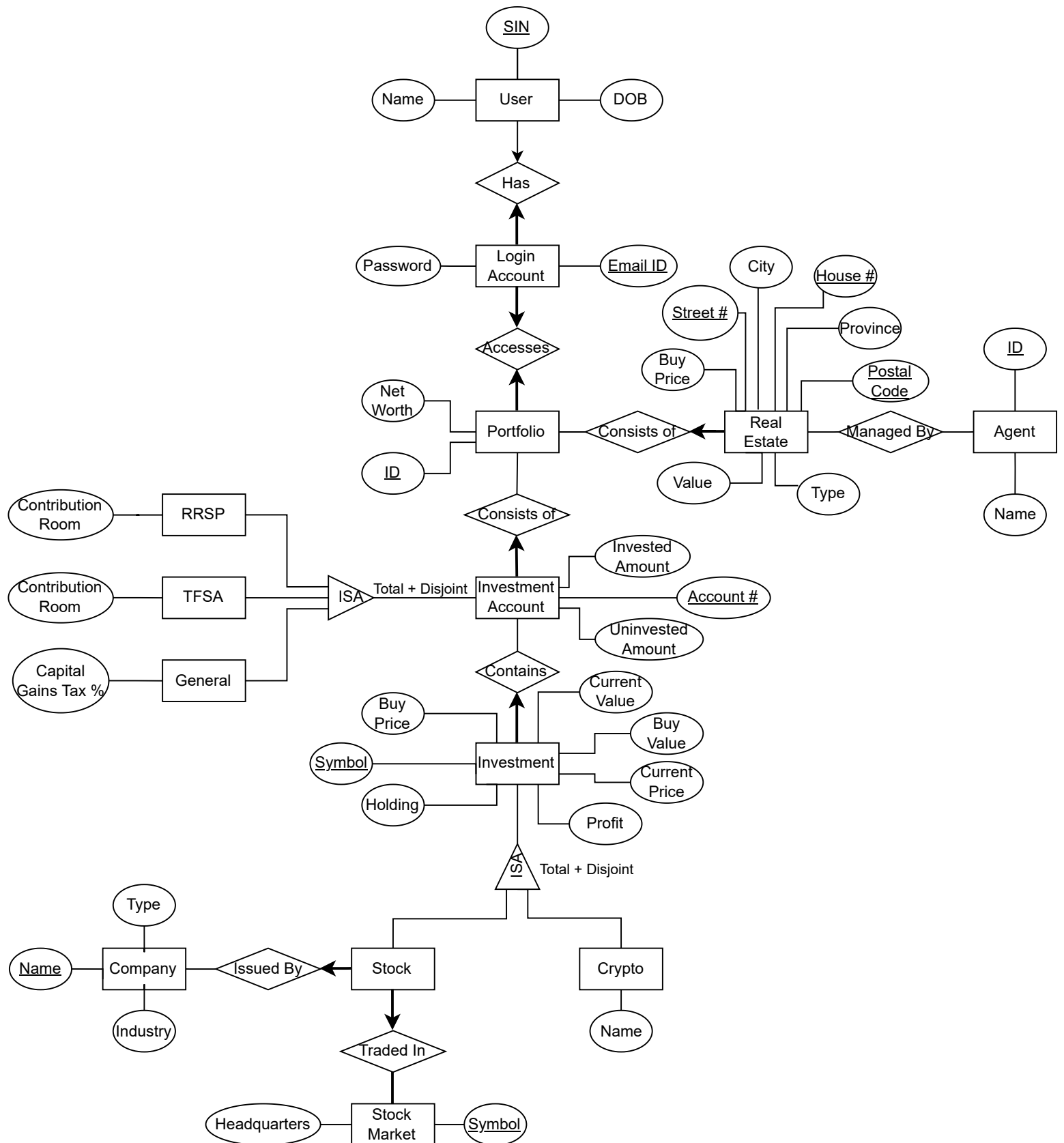
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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this 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



ER Diagram Changes

We made changes to the following entities in our ER diagram for clarity and Milestone 2 rubric purposes:

1. Login Account: changed the Primary Key from EmailID and Password to just EmailID.
2. Real Estate: replaced Address with Postal Code, House# and Street # as Primary Key
3. Portfolio: replaced SIN with ID as primary key
4. InvestmentAccount: added an attribute to each of the sub entities of the ISA.
5. Investment: replaced Value attribute with Buy Value and Current Value attributes.

Relational Schema

User (SIN, Name, DOB)

- Candidate key(s): SIN

LoginAccount (EmailID, Password, **SIN**)

- SIN cannot be NULL
- SIN must be UNIQUE
- Candidate key(s): EmailID

Portfolio (ID, NetWorth, **EmailID**)

- Email ID cannot be NULL
- EmailID must be UNIQUE
- Candidate key(s): ID

Real Estate (PostalCode, Street #, House #, **pID**, City, Province, BuyPrice, Value, Type)

- pID ¹ cannot be NULL
- Candidate key(s): Postal Code, Street#, House#

Managed By (**ID**, **PostalCode**, **Street #**, **House #**)

- Candidate key(s): AgentID, PostalCode, Street#, House#

Agent (ID, Name)

- Candidate key(s): ID

Investment Account (Account#, **ID**, InvestedAmount, UninvestedAmount)

- ID cannot be NULL

¹ pID is portfolio ID not to be confused with ID associated with Agent

- Candidate key(s): Account#

General(Account#, CapitalGainsTax)

- ID cannot be NULL
- Candidate key(s): Account#

RRSP (Account#, ContributionRoom)

- ID cannot be NULL
- Candidate key(s): Account#

TFSA (Account#, ContributionRoom)

- ID cannot be NULL
- Candidate key(s): Account#

Crypto (Symbol, Holding, **Account#**, Buy Price, Current Price, Buy Value, Current Value, Profit, Name)

- Candidate key(s): Symbol, Account#

Stock (Symbol, Holding, **Account#**, Buy Price, Current Price, Buy Value, Current Value, Profit, **CompanyName**, **StockMarketSymbol**)

- CompanyName cannot be NULL
- StockMarketSymbol cannot be NULL
- Candidate key(s): Symbol, Account#

Stock Market (Symbol, Headquarters)

- Candidate key(s): Symbol

Company (Name, Type, Industry)

- Candidate key(s): Name

Note: despite the Investment Account being an ISA total + disjoint, we still chose to model an Investment Account table due to the reference to Account# in both Crypto and Stock. This way, there is a default table to reference in the SQL code.

Functional Dependencies

User (SIN, Name, DOB)

- Functional Dependencies:
SIN \rightarrow Name, DOB
- Candidate Keys:
SIN

LoginAccount (EmailID, Password, **SIN**)

- Functional Dependencies:
Email ID \rightarrow Password, SIN
- Candidate Keys:
Email ID

Portfolio (ID, NetWorth, **EmailID**)

- Functional Dependencies:
ID \rightarrow Net Worth, Email ID
- Candidate Keys:
ID

Real Estate (PostalCode, Street #, House #, **pID**, City, Province, BuyPrice, Value, Type)

- Functional Dependencies:
House#, Street#, Postal Code \rightarrow Buy Price, Value, Type, City, Province, ID
Postal Code \rightarrow City, Province
- Candidate Keys:
House#, Street #, Postal Code

Managed By (**AgentID**, **PostalCode**, **Street #**, **House #**)

- Functional Dependencies:
none
- Candidate Keys:
ID, PostalCode, Street#, House#

Agent (ID, Name)

- Functional Dependencies:
ID \rightarrow Name
- Candidate Keys:
ID

Investment Account (Account#, **ID**, InvestedAmount, UninvestedAmount)

- Functional Dependencies
Account Number → Invested Amount, Uninvested Amount, ID
- Candidate Keys:
Account Number

TFSA (Account#, ContributionRoom)

- Functional Dependencies
Account Number → Contribution Room
- Candidate Keys:
Account Number

RRSP (Account#, ContributionRoom)

- Functional Dependencies
Account Number → Contribution Room
- Candidate Keys:
Account Number

General(Account#, CapitalGainsTax)

- Functional Dependencies
Account Number → Capital Gains Tax%
- Candidate Keys:
Account Number

Crypto (Symbol, Holding, **Account#**, Buy Price, Buy Value, Current Value, Profit, Name)

- Functional Dependencies:
Symbol → Buy Price, Current Price, Name
Symbol, Account# → Holding
Buy Price, Holding → Buy Value
Current Price, Holding → Current Value
Buy Value, Current Value → Profit
- Candidate Keys:
(Symbol, Account#)

Stock (Symbol, Holding, **Account#**, Buy Price, Buy Value, Current Value, Profit, **CompanyName**, **StockMarketSymbol**)

- Functional Dependencies:
Symbol → Buy Price, Current Price
Symbol, Account# → Holding, CompanyName, StockMarketSymbol

Buy Price, Holding \rightarrow Buy Value
Current Price, Holding \rightarrow Current Value
Buy Value, Current Value \rightarrow Profit

- Candidate Keys:
(Symbol, Account#)

Company (Name, Type, Industry)

- Functional Dependencies:
Name \rightarrow Type, Industry
- Candidate Keys:
Name

Stock Market (Symbol, Headquarters)

- Functional Dependencies:
Symbol \rightarrow Headquarters
- Candidate Keys:
Symbol

Normalization

Given the functional dependencies above, we notice that three relations are not in BCNF.

1. RealEstate:

Real Estate (PostalCode, Street #, House #, **pID**, City, Province, BuyPrice, Value, Type)

- Functional Dependencies:
 1. House#, Street#, Postal Code \rightarrow Buy Price, Value, Type, City, Province, ID
 2. Postal Code \rightarrow City, Province
- Candidate Keys:
House#, Street #, Postal Code

We calculate closures:

House#, Street#, Postal Code += {*House#, Street#, Postal Code, Buy Price, Value, Type, City, Province, ID*}

Postal Code += {*Postal Code, City, Province*}

Looking at the closures, we notice that 'Postal Code \rightarrow City, Province' FD violates BCNF since Postal Code is not a super key of the relation RealEstate. Therefore we need to split the relation using this FD.

RealEstate (*PostalCode*, *Street #*, *House #*, *pID*, *City*, *Province*, *BuyPrice*, *Value*, *Type*)

\rightarrow *RealEstate*₁ (*PostalCode*, *City*, *Province*)

\rightarrow *RealEstate*₂ (*PostalCode*, *Street #*, *House #*, *pID*, *BuyPrice*, *Value*, *Type*)

We check again and we notice that none of the functional dependencies violate BCNF and hence both *RealEstate*₁ and *RealEstate*₂ are in BCNF and this means that we normalized RealEstate correctly.

Final answer:

*RealEstate*₁ (*PostalCode*, *City*, *Province*)

*RealEstate*₂ (*PostalCode*, *Street #*, *House #*, *pID*, *BuyPrice*, *Value*, *Type*)

2. Crypto

Crypto (Symbol, Holding, Account#, Buy Price, Current Price, Buy Value, Current Value, Profit, Name)

- Functional Dependencies:

1. Symbol \rightarrow Buy Price, Current Price, Name
2. Symbol, Account# \rightarrow Holding
3. Buy Price, Holding \rightarrow Buy Value
4. Current Price, Holding \rightarrow Current Value
5. Buy Value, Current Value \rightarrow Profit

Candidate Keys:

Symbol, Account#

We calculate the closures:

Symbol += {*Symbol*, *Buy Price*, *Current Price*, *Name*}

Symbol, *Account#* += {*Symbol*, *Account#*, *Holding*, *Buy Price*, *Current Price*, *Name*, *Profit*, *CurrentValue*, *Buy Value*}

BuyPrice, *Holding* += {*BuyPrice*, *Holding*, *BuyValue*}

CurrentPrice, *Holding* += {*CurrentPrice*, *Holding*, *Current Value*}

$Buy\ Value, Current\ Value \twoheadrightarrow \{Buy\ Value, Current\ Value, Profit\}$

Looking at the closures we notice that the first FD as well as others violate BCNF. Therefore we need to split the relation using the violating FDs.

Using FD (5) we can split the relation as follows:

$Crypto (Symbol, Holding, Account\#, Buy\ Price, Current\ Price, Buy\ Value, Current\ Value, Profit, Name)$

$\rightarrow Crypto_1 (Buy\ Value, Current\ Value, Profit)$

$\rightarrow Crypto_2 (Buy\ Price, Current\ Price, Symbol, Holding, Account\#, Buy\ Value, Current\ Value, Name)$

We notice that $Crypto_1$ is not violated by any of the FDs, while $Crypto_2$ is violated by FD (1) so we use it to perform the decomposition

$Crypto_2 (Buy\ Price, Current\ Price, Symbol, Holding, Account\#, Buy\ Value, Current\ Value, Name)$

$\rightarrow Crypto_3 (Symbol, Buy\ Price)$

\rightarrow

$Crypto_4 (Symbol, Holding, Account\#, Buy\ Value, Current\ Value, Current\ Price, Name)$

We notice that $Crypto_3$ conforms to BCNF while $Crypto_4$ is violated by FD (4). Hence perform decomposition using this information.

$Crypto_4 (Symbol, Holding, Account\#, Buy\ Value, Current\ Value, Current\ Price, Name)$

$\rightarrow Crypto_5 (Current\ Price, Holding, Current\ Value)$

$\rightarrow Crypto_6 (Symbol, Holding, Account\#, Buy\ Value, Current\ Price, Name)$

We notice that $Crypto_5$ conforms to BCNF while $Crypto_6$ is violated by FD (1). We use that information to perform the decomposition

$Crypto_6 (Symbol, Holding, Account\#, Buy\ Value, Current\ Price, Name)$

$\rightarrow Crypto_7 (Symbol, Current\ Price)$

$\rightarrow Crypto_8 (Symbol, Holding, Account\#, Buy\ Value, Name)$

We notice that $Crypto_7$ conforms to BCNF while $Crypto_8$ is violated by FD (1). Therefore, we perform the decomposition accordingly.

$Crypto_8 (Symbol, Holding, Account\#, Buy\ Value, Current\ Price, Name)$

$\rightarrow Crypto_9 (Symbol, Name)$

$\rightarrow Crypto_{10} (Symbol, Holding, Account\#, Buy\ Value)$

Final Answer:

$Crypto_{10}(\underline{Symbol}, \underline{Holding}, \underline{Account\#}, \underline{Buy\ Value})$

$Crypto_9(\underline{Symbol}, \underline{Name})$

$Crypto_7(\underline{Symbol}, \underline{CurrentPrice})$

$Crypto_5(\underline{CurrentPrice}, \underline{Holding}, \underline{Current\ Value})$

$Crypto_3(\underline{Symbol}, \underline{BuyPrice})$

$Crypto_1(\underline{Buy\ Value}, \underline{Current\ Value}, \underline{Profit})$

3. Stock

Using a very similar process to the one used in Crypto, we derive the following solution.

Stock (Symbol, Holding, Account#, Buy Price, Buy Value, Current Value, Profit, **cName**, **smSymbol**)

- Functional Dependencies:

$Symbol \rightarrow Buy\ Price, Current\ Price$

$Symbol, Account\# \rightarrow Holding, CompanyName, StockMarketSymbol$

$Buy\ Price, Holding \rightarrow Buy\ Value$

$Current\ Price, Holding \rightarrow Current\ Value$

$Buy\ Value, Current\ Value \rightarrow Profit$

- Candidate Keys:

$Symbol, Account\#$

We calculate the closures:

- $Symbol^+ = \{Symbol, Buy\ Price, Current\ Price\}$
- $Symbol, Account\#^+ = \{Symbol, Account\#, Holding, Buy\ Price, Current\ Price, Profit, CurrentValue, Buy\ Value, cName, smSymbol\}$
- $BuyPrice, Holding^+ = \{BuyPrice, Holding, BuyValue\}$
- $CurrentPrice, Holding^+ = \{CurrentPrice, Holding, Current\ Value\}$
- $Buy\ Value, Current\ Value^+ = \{Buy\ Value, Current\ Value, Profit\}$

Looking at the closures we notice that the first FD as well as others violate BCNF. Therefore we need to split the relation using the violating FDs.

Using FD, we can split the relation as follows:

Stock (Symbol, Holding, Account#, Buy Price, Current Price, Buy Value, Current Value, Profit, **cName**, **smSymbol**)

$\rightarrow Stock_1(\underline{Buy\ Value}, \underline{Current\ Value}, \underline{Profit})$

→ $Stock_2$ (Buy Price, Current Price, Symbol, Holding
Account#, Buy Value, Current Value, , cName, smSymbol)

We notice that $Crypto_1$ is not violated by any of the FDs, while $Crypto_2$ is violated by FD (1) so we use it to perform the decomposition

$Stock_2$ (Buy Price, Current Price, Symbol, Holding, Account#, Buy Value, Current Value
, cName, smSymbol)

→ $Stock_3$ (Symbol, BuyPrice)

→ $Stock_4$ (Symbol, Holding, Account#, Buy Value, Current Value, Current Price
, cName, smSymbol)

We notice that $Crypto_3$ conforms to BCNF while $Crypto_4$ is violated by FD (4). Hence perform decomposition using this information.

$Stock_4$ (Symbol, Holding, Account#, Buy Value, Current Value, Current Price,
, cName, smSymbol)

→ $Stock_5$ (CurrentPrice, Holding, Current Value)

→ $Stock_6$ (Symbol, Holding, Account#, Buy Value , Current Price, cName, smSymbol))

We notice that $Crypto_5$ conforms to BCNF while $Crypto_6$ is violated by FD (1). We use that information to perform the decomposition

$Stock_6$ (Symbol, Holding, Account#, Buy Value , Current Price)

→ $Stock_7$ (Symbol, CurrentPrice)

→ $Stock_8$ (Symbol, Holding, Account#, Buy Value , cName, smSymbol)

We notice that $Stock_7$ conforms to BCNF and $Stock_8$ is also in BCNF.

Final Answer:

$Stock_8$ (Symbol, Holding, Account#, Buy Value , cName, smSymbol)

$Stock_7$ (Symbol, CurrentPrice)

$Stock_5$ (CurrentPrice, Holding, Current Value)

$Stock_3$ (Symbol, BuyPrice)

$Stock_1$ (Buy Value, Current Value, Profit)

SQL

```
CREATE TABLE User(  
    SIN INT(9) PRIMARY KEY,  
    Name CHAR(50),  
    DOB CHAR(11)  
)
```

```
CREATE TABLE LoginAccount(  
    EmailID CHAR(50) PRIMARY KEY,  
    Password CHAR(100),  
    SIN INT(9) NOT NULL,  
    FOREIGN KEY(SIN) REFERENCES User(SIN),  
    UNIQUE(SIN)  
)
```

```
CREATE TABLE Portfolio(  
    ID INT PRIMARY KEY,  
    NetWorth INT,  
    EmailID CHAR(50),  
    FOREIGN KEY(EmailID) REFERENCES LoginAccount(EmailID),  
    UNIQUE(EmailID)  
)
```

```
CREATE TABLE RealEstate(  
    PostalCode CHAR(10),  
    StreetNumber INT,  
    HouseNumber INT,  
    pID INT NOT NULL,  
    BuyPrice INT,  
    Value INT,  
    PRIMARY KEY (StreetNumber, HouseNumber, PostalCode),  
    FOREIGN KEY (pID) REFERENCES Portfolio(pID)  
)
```

```
CREATE TABLE ManagedBy(  
    ID INT FOREIGN KEY REFERENCES Agent(ID),  
    PostalCode CHAR(10) FOREIGN KEY REFERENCES RealEstate(PostalCode, StreetNumber,  
    HouseNumber),  
    StreetNumber INT FOREIGN KEY REFERENCES RealEstate(PostalCode, StreetNumber,  
    HouseNumber),  
    HouseNumber INT FOREIGN KEY REFERENCES RealEstate(PostalCode, StreetNumber,  
    HouseNumber),  
    PRIMARY KEY (ID, StreetNumber, HouseNumber, PostalCode)
```

)

```
CREATE TABLE Agent(  
    ID INT PRIMARY KEY,  
    Name CHAR(50)
```

)

```
CREATE TABLE InvestmentAccount(  
    AccountNumber CHAR(14) PRIMARY KEY,  
    pID INT NOT NULL,  
    InvestedAmount INT,  
    UninvestedAmount INT,  
    FOREIGN KEY (pID) REFERENCES Portfolio(ID)
```

)

```
CREATE TABLE General(  
    AccountNumber CHAR(14) PRIMARY KEY,  
    CapitalGainsTax INT
```

)

```
CREATE TABLE RRSP(  
    AccountNumber CHAR(14) PRIMARY KEY,  
    ContributionRoom INT
```

)

```
CREATE TABLE TFSA(  
    AccountNumber CHAR(14) PRIMARY KEY,  
    ContributionRoom INT
```

)

```
CREATE TABLE Crypto(  
    Symbol CHAR(10),  
    AccountNumber INT NOT NULL,  
    BuyPrice INT,  
    CurrentPrice INT,  
    Holding INT,  
    BuyValue INT,  
    CurrentValue INT,  
    Profit INT,  
    Name CHAR(50),  
    PRIMARY KEY (Symbol, AccountNumber),  
    FOREIGN KEY (AccountNumber) REFERENCES InvestmentAccount (AccountNumber)
```

)

```
CREATE TABLE Stock(  
    Symbol INT,  
    AccountNumber INT NOT NULL FOREIGN KEY REFERENCES  
    InvestmentAccount(AccountNumber),  
    BuyPrice INT,  
    CurrentPrice INT,  
    Holding INT,  
    BuyValue INT,  
    CurrentValue INT,  
    Profit INT,  
    Name CHAR(50) FOREIGN KEY REFERENCES Company(Name),  
    smSymbol INT FOREIGN KEY REFERENCES StockMarket(smSymbol)  
    PRIMARY KEY (Symbol, AccountNumber)
```

```
)
```

```
CREATE TABLE StockMarket(  
    smSymbol INT PRIMARY KEY,  
    headquarters CHAR(50),
```

```
)
```

```
CREATE TABLE Company(  
    Name CHAR(50) PRIMARY KEY,  
    Type CHAR(50),  
    Industry CHAR(50)
```

```
)
```

Note: Please note that we wrote the SQL statements for tables prior to normalization since it was not specified in the rubric otherwise. That also applies to the populated table where we only chose to normalize the RealEstate populated table

INVESTMENT PORTFOLIO POPULATED TABLES

User

SIN	Name	DOB
123456789	Bruce Wayne	04/17/1980
987654321	Jack Napier	04/25/1985
135792468	Peter Parker	08/10/2001
246813579	Gangadhar Shastri	06/19/1970
192837465	Barry Allen	03/14/1996

LoginAccount

Email ID	Password	SIN
vengeance@hotmail.com	@1fr3d	123456789
joker@yahoo.com	h@r13y	987654321
bugspray@gmail.com	unc13b3n	135792468
shaktimaan@hotmail.com	0gh3r0	246813579
crimsoncomet@gmail.com	t00qu1ck	192837465

Portfolio

ID	Net Worth	Email ID
77	47320000	vengeance@hotmail.com
69	5207500	joker@yahoo.com
50	5098689	bugspray@gmail.com
10	3733400	shaktimaan@hotmail.com
33	3508100	crimsoncomet@gmail.com

Real Estate

House #	Street #	Postal Code	City	Province	Portfolio ID	Buy Price	Value	Type
7	Mountain Drive	10001	Gotham	NY	77	10000000	32000000	Residential
69	Mystery Ave	10069	Gotham	NY	69	3000000	5000000	Residential
20	Ingram St	11005	New York City	NY	50	5000000	5000000	Commercial
14	Main St	V5W2S7	Vancouver	BC	10	1000000	2000000	Residential
50	Henry Ave	M3C0C3	Central City	ON	33	2000000	3000000	Residential

Normalization
"=====>"

Postal Code	City	Province
10001	Gotham	NY
10069	Gotham	NY
11005	New York City	NY
V5W2S7	Vancouver	BC
M3C0C3	Central City	ON

Postal Code	House #	Street #	Portfolio ID	Buy Price	Value	Type
10001	7	Mountain Drive	77	10000000	32000000	Residential
10069	69	Mystery Ave	69	3000000	5000000	Residential
11005	20	Ingram St	50	5000000	5000000	Commercial
V5W2S7	14	Main St	10	1000000	2000000	Residential
M3C0C3	50	Henry Ave	33	2000000	3000000	Residential

Managed By

Agent ID	House #	Street #	Postal Code
12345	7	Mountain Drive	10001
54321	69	Mystery Ave	10069
13524	20	Ingram St	11005
24135	14	Main St	V5W2S7
15243	50	Henry Ave	M3C0C3

Agent

ID	Name
12345	Celina Kyle
54321	Harley Quinn
13524	Mary Jane
24135	Amogh Sinha
15243	Iris West

Investment Account

Account #	Portfolio ID	Invested Amount	Uninvested Amount
GBOG1234567890	77	5000000	10000000
GBOG9876543210	69	200000	0
GQNS1357924680	50	20000	30000
GSCT2468013579	10	160000	1500000
GBCC1029384756	33	500000	0
RBOG9837564728	77	200000	70000
RBOG0956294758	69	7500	0
RQNS1038295826	50	0	6000
RSCT1085672649	10	0	65000
RBCC0928456738	33	0	0
TBOG0987894567	77	0	50000
TBOG1230984513	69	0	0
TQNS0917587285	50	4800	37889
TSCT0956728573	10	6400	2000
TBCC0978547031	33	8100	0

General

Account #	Capital Gains Tax %
GBOG1234567890	17
GBOG9876543210	12
GQNS1357924680	12
GSCT2468013579	12
GBCC1029384756	5

RRSP

Account #	Contribution Room
RBOG9837564728	100000
RBOG0956294758	50000
RQNS1038295826	75000
RSCT1085672649	60000
RBCC0928456738	25000

TFSA

Account #	Contribution Room
TBOG0987894567	100000
TBOG1230984513	50000
TQNS0917587285	60000
TSCT0956728573	150000
TBCC0978547031	60000

Crypto

Symbol	Account #	Holding	Buy Price	Buy Value	Current Price	Current Value	Profit	Name
BTC	GBOG1234567890	100	30000	3000000	50000	5000000	2000000	Bitcoin
ETH	GBOG9876543210	50	1500	75000	4000	200000	125000	Ethereum
APE	GQNS1357924680	1000	7	7000	20	20000	13000	ApeCoin
ETH	GSCT2468013579	40	1500	60000	4000	160000	100000	Ethereum
BTC	GBCC1029384756	10	30000	300000	50000	500000	200000	Bitcoin

Normalization
"=====>"

Symbol	Account #	Holding	Buy Value
BTC	GBOG1234567890	100	3000000
ETH	GBOG9876543210	50	75000
APE	GQNS1357924680	1000	7000
ETH	GSCT2468013579	40	60000
BTC	GBCC1029384756	10	300000

Symbol	Name
BTC	Bitcoin
ETH	Ethereum
APE	ApeCoin

Symbol	Buy Price
BTC	30000
ETH	1500
APE	7

Symbol	Current Price
BTC	50000
ETH	4000
APE	20

Buy Value	Current Value	Profit
3000000	5000000	2000000
75000	200000	125000
7000	20000	13000
60000	160000	100000
300000	500000	200000

Current Price	Holding	Current Value
50000	100	5000000
4000	50	200000
20	1000	20000
4000	40	160000
50000	10	500000

Stock

Symbol	Account #	Holding	Buy Price	Buy Value	Current Price	Current Value	Profit	Company Name	Stock Market Symbol
WAYNE	RBOG9837564728	1000	10	10000	200	200000	190000	Wayne Enterprises	NYSE
STAR	RBOG0956294758	50	55	2750	150	7500	4750	Star Labs	TSX
GOOGL	TQNS0917587285	40	45	1800	120	4800	3000	Alphabet Inc.	NASDAQ
APL	TSCT0956728573	40	100	4000	160	6400	2400	Apple Inc.	NASDAQ
MSFT	TBCC0978547031	30	150	4500	270	8100	3600	Microsoft Corporation	NASDAQ

Normalization
"=====>"

Symbol	Account #	Holding	Buy Value	Company Name	Stock Market Symbol
WAYNE	RBOG9837564728	1000	10000	Wayne Enterprises	NYSE
STAR	RBOG0956294758	50	2750	Star Labs	TSX
GOOGL	TQNS0917587285	40	1800	Alphabet Inc.	NASDAQ
APL	TSCT0956728573	40	4000	Apple Inc.	NASDAQ
MSFT	TBCC0978547031	30	4500	Microsoft Corporation	NASDAQ

Symbol	Buy Price
WAYNE	10
STAR	55
GOOGL	45
APL	100
MSFT	150

Symbol	Current Price
WAYNE	200
STAR	150
GOOGL	120
APL	160
MSFT	270

Buy Value	Current Value	Profit
10000	200000	190000
2750	7500	4750
1800	4800	3000
4000	6400	2400
4500	8100	3600

Current Price	Holding	Current Value
200	1000	200000
150	50	7500
120	40	4800
160	40	6400
270	30	8100

Stock Market

Symbol	Headquarters
NYSE	New York, USA
NASDAQ	New York, USA
NSE	Mumbai, India
TSX	Toronto, Canada
LSE	London, UK

Company Name

Name	Type	Industry
Wayne Enterprises	Public	Conglomerate
Star Labs	Private	Research
Alphabet Inc.	Public	Conglomerate
Apple Inc.	Public	Technology
Microsoft Corporation	Public	Technology