Phase I

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Data Types

User

Attribute	**Data Type**	**Nullable**
Email	String	No
Password	String	No
Nickname	String	No
First Name (Part of Name)	String	No
Last name (Part of Name)	String	No

Address

Attribute	**Data Type**	**Nullable**
Postal Code	String	No
City	String	No
State	String	No
Latitude	Floating	No
Longitude	Floating	No

Item

Attribute	**Data Type**	**Nullable**
Description	String	Yes
Name	String	No
Item Number	Integer	No

Condition

Attribute	**Data Type**	**Nullable**
Type	String	No

Trade

Attribute	**Data Type**	**Nullable**

Proposed Date	DateTime	No
Trade Status	String	No
Accept/Reject Date	DateTime	Yes

Board Game

Attribute	**Data Type**	**Nullable**

Playing Card Game

Attribute	**Data Type**	**Nullable**

Collectible Card Game

Attribute	**Data Type**	**Nullable**
No Of Cards	Integer	No

Video Game

Attribute	**Data Type**	**Nullable**

Computer Game

Attribute	**Data Type**	**Nullable**

Platform

Attribute	**Data Type**	**Nullable**
Name	String	No

Media

Attribute	**Data Type**	**Nullable**
Name	String	No

Platform

Attribute	**Data Type**	**Nullable**
Name	String	No

Business Logic Constraints

- Postal code limited to a provided list of available values
- Limit choices of video game media to be only optical disc, game card, or cartridge
- Computer game platform choices limited to Linux, macOS, or Windows
- Item condition limited to Unopened, Like New, Lightly Used, Moderately Used, Heavily Used, or Damaged/Missing parts
- Items that have a trade pending or a completed trade is not available for trading
- User details cannot be updated after registration
- Thresholds of different user ranks and what ranks a user can de defined as are limited
- If a user has two or more unaccepted trades as the counterparty, they cannot list more items to trade
- Only items available for trade can appear in search results
- Haversine formula should be used to calculate distance between the user and an item they wish to trade for in the search
- Item search fields are exclusive
- User with two or more unaccepted trade where they are the counterparty should not be able to propose a trade
- A trade between two items that has been rejected cannot be proposed again

Task Decomposition

As a note, frequency would be rated from a scale of 1-10 with logging in serving as the base of a value of 5 as reference.

Login

Lock Types	1 Read Lock on User
Enabling Conditions	NA
Frequency	5
Schemas	User
Indices	No
Consistency	Low
Subtasks	NA

User Register

Lock Types	1 Write Lock on User

Enabling Conditions	NA
Frequency	4
Schemas	User
Indices	No
Consistency	High
Subtasks	NA

Main Menu

Lock Types	3 Read Lock on User, Item, and Trade
Enabling Conditions	User is signed in
Frequency	8
Schemas	User, Item, Trade
Indices	Yes
Consistency	Low
Subtasks	View Number of Unaccepted Trades View Response Time View Rank

Listing an Item

Lock Types	1 Read Lock on Trade. 1 Write Lock on Item
Enabling Conditions	User is signed in
Frequency	7
Schemas	Trade, Item
Indices	Yes
Consistency	High
Subtasks	NA

My Items

Lock Types	2 Read Lock on User and Item
Enabling Conditions	User is signed in
Frequency	7
Schemas	User, Item
Indices	Yes
Consistency	Low
Subtasks	NA

Searching for Items

Lock Types	3 Read Lock on User, Item, and Trade
Enabling Conditions	User is signed in
Frequency	9
Schemas	User, Item, Trade
Indices	Yes
Consistency	Low
Subtasks	View items available for trade View filtered items available for trade

View Item

Lock Types	3 Read Lock on User, Item, and Address
Enabling Conditions	User is signed in
Frequency	10
Schemas	User, Item
Indices	Yes
Consistency	Low
Subtasks	View distance between User View item details

Proposing a Trade

Lock Types	2 Read Lock on User and Item. 1 Write Lock on Trade
Enabling Conditions	User is signed in
Frequency	8
Schemas	User, Item, Trade
Indices	No
Consistency	High
Subtasks	View tradable items Propose trade

Accept/Reject Trade

Lock Types	3 Read Lock on User, Item, and Trade. 1 Write Lock on Trade
Enabling Conditions	User is signed in
Frequency	7
Schemas	User, Item, Trade
Indices	No
Consistency	Yes
Subtasks	Find my items with pending trade Accept trade Reject trade

Trade History

Lock Types	3 Read Locks on User, Item, and Trade
Enabling Conditions	User is signed in
Frequency	4
Schemas	User, Item, Trade
Indices	3
Consistency	No

Subtasks	Find completed trades Display completed trades

Trade Details

Lock Types	3 Read Locks on User, Item, and Trade
Enabling Conditions	User is signed in
Frequency	4
Schemas	User, Item, Trade
Indices	3
Consistency	No
Subtasks	Display User details Display Item details Display Trade details

Abstract Code

Login

- While no buttons are pushed, do nothing
- When button is pushed do the following
    - If login button: Check *Email/Nickname* and *Password* combination is in database
        - If present run **Main Menu**
        - If not present execute **Login**
    - If register button: Execute **Register**

Register

- While no buttons are pushed, do nothing
- When register button is pushed: Update User with new *User information*
    - If successful: Execute **Main Menu**
    - If not successful: Execute **Register**

Main Menu

- Find current user using the Email
- Find the items User listed from the Item using the User's Email
- Calculate the number of unaccepted trade from Trade using the Item Number from Item
- Display the number of unaccepted trades
- Calculate the average response time of the User from Trade using the Item Number from Item to calculate average difference between Proposed Date and Accept/Reject Date

- Display the average response time
- Calculate the number of completed trades of the User from Trade using the Item Number from Item
- Calculate the rank of the user from the number of completed trade
- Display the rank
- While no buttons are pushed, do nothing
- When button is pushed do the following
    - If logout button: Execute **Login**
    - If list item button: Execute **Listing an Item**
    - If search item button: Execute **Searching for Item**
    - If trade history button: Execute **Trade History**

Listing an Item

- While no buttons are pushed, do nothing
- When list item button is pushed: Update Item with the new item listed
    - If successful: Show confirmation
        - Execute **Main Menu**
    - If not successful: Show error prompt
        - Execute **Listing an Item**

My Items

- Find the items User listed from the Item using the User's Email
- Display item details for all Item found

Searching for Items

- Find all Item from the Item table that has not been accepted in a Trade
- While no buttons are pushed, do nothing
- When search button is pushed: Filter out results that does not meet *filter criteria*
- Display Items found from search
- If no items are found display no items found error prompt
    - Execute **Searching for Items**
- While no buttons are pushed, do nothing
- When button is pushed, do the following:
    - If search button is pushed: Execute **Searching for Items**
    - If detail button is pushed: Execute **View Item**

View Item

- Find item using *Item Number* from the Item table
- Calculate distance between User searching and the User that listed the item using the *Email* of the two User to find the Address

- Display item details for Item found
- While no buttons are pressed, do nothing
    - If propose trade button is pushed: Execute **Proposing a Trade**

Proposing a Trade

- Find items from signed in User from the Item table that has not been accepted in a Trade
- Calculate the distance between the User proposing the trade and the User that listed the Item using the *Email* to find the Address
- While no buttons are pushed, do nothing
- When confirm button is pushed
    - If distance is greater than 100 miles, display warning message
    - Display confirmation message of trade
    - When no buttons are pushed, do nothing
    - When main menu button pushed: Execute **Main Menu**

Accept/Reject Trade

- Find all Item signed in User listed using *Email* on Item
- Find all Items from found Items that have a proposal without an accept/reject relationship
- Display Items with pending accept/reject Trade
- While no buttons are pushed, do nothing
- When button is pushed, do the following:
    - If accept button pushed: Update accepted date of Item in Trade with current date
        - Display confirmation of trade acceptance
        - When no buttons are pushed, do nothing
        - When ok buttons is pushed: Execute **Main Menu**
    - If reject button pushed: Update rejected date of Item in Trade with current date
        - Execute **Main Menu**

Trade History

- Find all Item listed by sign in User
- Find all Trade of Item with Accepted/Rejected date set
- Calculate the percentage and number of accepted/rejected trades
- Display item and trade detail
- While no buttons are pushed, do nothing
- When detail button is pushed: Execute **Trade Details**

Trade Details

- Find item wanted from Item using *Item Number*
- Find the Trade of the Item to display using *Accept/Reject Date*
- Find the counterparty and proposer User
- Display the User information

- Display the Item information
- Display the Trade information