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Data Types

Entity - User

Attribute	Data Type	Nullable
Nickname	string	No
Email	string	No
Password	string	No
First Name	string	No
Last Name	string	No
Postal Code	string	No

Entity - Address

Attribute	Data Type	Nullable
Longitude	float	No
Latitude	float	No
City	string	No
Postal Code	string	No
State	string	No

Entity - Item

Attribute	Data Type	Nullable
Item Number	integer	No
Name/title	string	No
Condition	string	No
Description	string	Yes
Game Type	string	No
Platform	string	Yes
No of Cards	string	Yes
Media	string	Yes

Entity - Trade

Attribute	Data Type	Nullable
Proposed Date	datetime	No
Trade Status	string	No
Accept/Reject Date	datetime	No
Proposed Item	Integer	No
Desired Item	Integer	No

Business Logic Constraints

1. Users would register on log in screen themselves
2. Email can only be registered once
3. Users are not allowed to update their details after registering
4. Error will be shown on login screen if username/nickname is registered but password is incorrect
5. Email should be in the valid email format
6. If a user has more than two unaccepted trades they cannot list a new item. Application should throw an error
7. If a user has more than two unaccepted trades, they cannot propose a trade and should not be allowed to visit propose trade form
8. Postal Code, State and City must be in the USA
9. A user cannot propose a trade with themselves
10. A user must list an item before proposing a trade
11. If a trade is rejected, that specific item-for-item trade cannot be proposed again
12. Items that have been traded cannot be traded again
13. If a trade is rejected, a new trade for the proposed item and desired item cannot be proposed again
14. User can select only one game type for a listing
15. Items associated with a pending trade (a proposed trade not yet accepted or rejected) are not available for trading
16. When listing an item, application should only show fields related to the item type
17. When searching for an item, the parameters used to search are exclusive
18. Only items available for trading should be displayed

Task Decomposition & Abstract Code

Login

Task decomposition

Lock Type - Read - only on USER Table
Number of Locks - single
Enabling Conditions - none
Consistency (ACID) - Consistency is not critical; order is not critical
Frequency - 100 logins
Subtasks - Mother Task is not needed. No decomposition needed.



Abstract code

- BEGIN
- Display username/nickname, password field, login CTA, New user registration CTA(Call To Action)
- On click of Registration CTA redirect the user to registration screen
On click of Login CTA - lookup USER database with username/nickname and password If username and password combination doesn't match
 - Then display error "username or password doesn't match" on the login screen Else if username doesn't exist in the database
 - Then display error "username doesn't match the records. Please create an account" on the login screen
- Else

- redirect to the main screen
 - END
-

Register

Task decomposition

Lock Type - Write on USER Table, read on ADDRESS table
Number of Locks - Single
Enabling Conditions - None
Consistency (ACID) - Consistency is not critical; order is not critical; Atomicity is needed.
Frequency - 10 registrations
Subtasks - Mother Task is not needed. No decomposition needed.



Abstract code

- BEGIN
- Display email, nickname, password, first name, last name, postal code
- On click of *Register* CTA, validate that all the fields are completed and are in the required format. Lookup **ADDRESS** table to validate postal code
- If validation error occurs
 - Then display appropriate error and keep user on the form
- Write the values to USER table
- Redirect user to Main Menu

- END

Main Menu

Task decomposition

Lock Type - Read-only on USER, TRADE, ITEM LISTING Tables
Number of Locks - Three
Enabling Conditions - Log In / Register
Consistency (ACID) - Consistency is not critical; order is not critical
Frequency - 500 views
Subtasks - Mother Task is not needed. No decomposition needed.



Abstract code

- BEGIN
- Display welcome message with first name, last name and nickname in parantheses
- Display average response time in days by looking into trade table fields proposed date and accept/reject date for each trade
 - The text color should be as below
 - If response time is None Then Black
 - Else if response time in between 0 and 7.0 Then

- Green
 - Else if response time in between 7.1 and 14.0 Then Yellow
 - Else if response time in between 14.1 and 20.9 Then Orange
 - Else if response time in between 21.0 and 27.9 Then Red
 - Else if response time > 28.0 Then Bolded Red
 - If number of proposed trades > 0 Then display link to accept/reject trades
 - If number of unaccepted trades > 2 Then print number of trades in bold and red
 - Display User's trade rank by looking up Trade table
 - If no of trades == 0 Then None
 - Else if no of trades in between 1 and 2 Then Aluminium
 - Else if no of trades in between 3 and 4 Then Bronze
 - Else if no of trades in between 4 and 5 Then Silver
 - Else if no of trades in between 6 and 7 Then Gold
 - Else if no of trades in between 8 and 9 Then Platinum
 - Else if no of trades > 10 Then Alexandinium
 - Display link to Listing an item
 - Display link to My items
 - Display link to Search Items
 - Display link to Trade History
 - Display Logout button
 - On click of Logout Button
 - Redirect user to Login screen
 - END
-

Add Listing

Task decomposition

Lock Type - Read-only on TRADE. Read & Write lock on ITEM LISTING
Number of Locks - Two
Enabling Conditions - Click on List Item CTA, Logged In user, less than 2 unaccepted trades
Consistency (ACID) - Order critical
Frequency - 200 item listings
Subtasks - Mother task needed. Decomposition not needed.



Abstract Code

- BEGIN

- Look up Trade table to get total unaccepted trades of user If user has > 2 unaccepted trades
 - Then display error “Cannot list item. Check pending trades”
Disable page
 - Look up ITEM LISTING table to get Game types and related fields Display Game Type dropdown
 - Display remaining fields based on Game Type selected
 - On Click List Item CTA
 - Validate fields and throw appropriate messages to the user. Stay on the Screen.
 - If no error
 - Write field values to ITEM LISTING table
 - Return to the screen with a success message pop up.
 - END
-

Search

Task decomposition

Lock Type - Read-only on USER, ITEM LISTING, TRADE Tables
Number of Locks - Three
Enabling Conditions - Log In / Register
Consistency (ACID) - Consistency is not critical. Order is not critical.
Frequency - 500 searches
Subtasks - Calculate User Distance, Search Items, Display Search Details



Abstract code

- BEGIN
- Display a list of radio buttons which allow to search by keyword, in users postal code, within X miles, in specified postal code
- On Click Search! CTA:
- IF results are found:
 - Then get items' details from ITEM LISTING
 - Get user postcode from ADDRESS
 - Calculate distance with Calculate User Distance
 - Display results with Display Search Details
 - Display item number, game type, item name/title, the condition and the first 100 characters of the description (if the description is greater than 100 characters, place an ellipsis (...) at the end to indicate it has been truncated) , average response time and trader rank of other user
 - IF search by keyword selected:
 - Then highlight the fields that match the keyword in blue
 - IF search by postcode is selected AND the postcode is invalid:
 - Then display an error message
 - On click Detail CTA:
 - Redirect to a matching View Item page
- ELSE
 - Display a message "Sorry, no results found!"
- END

View Item

Task decomposition

Lock Type - Read-only on USER, ITEM LISTING, TRADE Tables
Number of Locks - Three
Enabling Conditions - Log In / Register
Consistency (ACID) - Consistency is not critical. Order is not critical.
Frequency - 700 views
Subtasks - Get Item Details, Get User Details



Abstract code

- BEGIN
- Get items details from ITEM LISTING
- Get user's details from USER
- Get user's address details from ADDRESS
- Get user's Trades from Trades
- Display the following details about an item:
 - #, title, game type, platform, media, item condition
 - IF item description is NOT null
 - Then display description
 - ELSE
 - hide description
-
- Display the following details about a user:

- nickname, city, state, postal code, Response time
- Use “Calculate User Distance” subtask to get distance between the user and the item’s owner
- IF user’s post code != item’s owner post code
 - Then display distance
 - IF $0.0 < \text{distance} < 25.0$ miles
 - Then add green background
 - IF $25.00 < \text{distance} < 50.0$ miles
 - Then add yellow background
 - IF $50.00 < \text{distance} < 100.0$ miles
 - Then add orange background
 - IF $\text{distance} > 100.0$ miles
 - Then add red background
- ELSE
 - Hide distance
- Different elements to be displayed based on the context
- IF USER unaccepted trades < 2
 - Then display Propose Trade
- ELSE
 - Do not display Propose Trade
- On click of Propose Trade, redirect to Add Trade Proposal
- END

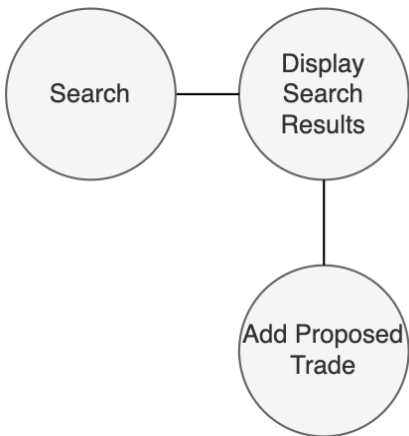
Propose Trade

Task decomposition

Lock Type - Read-only on USER and Read and Write lock on ITEM LISTING Tables
Number of Locks - Two
Enabling Conditions - Login and User has less than 2 unaccepted Trades and has at least 1 Item listed in his/her login
Consistency (ACID) - We need to ensure, desired item is locked once identified for trade by a user

Frequency - 300 proposals

Subtasks - Mother task needed. Decomposition is needed. Search, Display Search Results, Propose Trade



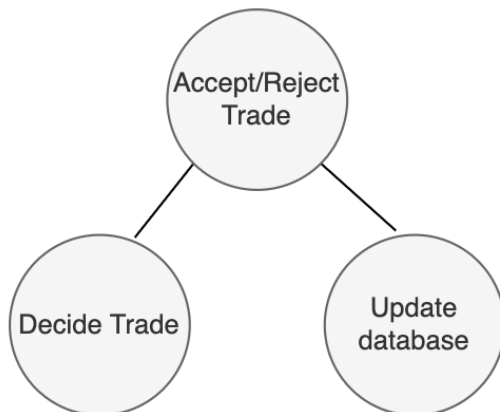
Abstract code

- BEGIN
- Search, Calculate User Distance, Display Search Results
- If counterparty distance ≥ 100.0 , a warning message showing distance at the top should be shown.
- Must display only items that are available for trading (self).
- Provide appropriate mechanism to choose the desired item
- Should display Item number, game type, title, and condition
- Should be ordered by item number
- Once the proposed item is chosen, the user must be provided with a confirm Button to confirm the proposal.
- Once confirmed, the date proposal was made is stored/written into the Trade table
- A confirmation message should be displayed allowing the user to return to the main menu.
- END

Accept / Reject trades

Task decomposition

Lock Type - Read and Write Lock on Trade table, Read lock on USER and ITEM LISTING table
Number of Locks - Three
Enabling Conditions - Login and Has pending Proposals
Consistency (ACID) - Not needed as it is available only to the user
Frequency - 300 decisions
Subtasks - Mother task needed. Decomposition is needed. Decide Trade, Update Database



Abstract code

- BEGIN
- Search, Display Search Results
- List proposed trades where user is the counterparty so they may accept or reject a Trade
- For each proposal, show the date proposed, desired item's title, proposer's nickname, their rank, distance from user (rounded to hundreths) and proposed item title, ordered by proposal date.
- Both item fields should link to the item's detail page
- Accept/Reject mechanism should be provided: (Decide Trade), Accept, Reject

- If trade is accepted, query the USER table and display a dialog with the proposer's Email and first name.
- The acceptance / rejection date of the trade is recorded into the database as part of trade table (Update Database)
 - If rejected, a new trade for the same proposed item and the same desired item cannot be proposed again by the same proposer
 - Accepting a trade removes the item from the listing (Search and Display Search Results) and if no more trades need to be accepted or rejected, the user should be returned to the main menu.
- END

View Trade History

Task decomposition

Lock Type - Read-only on USER, ITEM LISTING Read and Write lock on Trade Table
Number of Locks - Three
Enabling Conditions - Log In
Consistency (ACID) - Not needed as it is available only to the user
Frequency - 200 views
Subtasks - Get Item Details, Get User Details



Abstract code

- BEGIN
 - Get users' details from USER
 - Get items details from ITEM LISTING
 - Get trades details by USER, ITEM LISTING
- Calculate trade summary for user and present as a view:
 - SUM(Accepted, Rejected) AS Total,
 - COUNT(CASE WHEN trade status = 'Accepted') AS Accepted,
 - COUNT(CASE WHEN trade status = 'Rejected') AS Rejected,
 - (Rejected/Total) AS Rejected %
 - GROUP BY USER email, role
 - IF Rejected % >= 50%
 - Highlight 'Red'
- Display the following details about a trade,sorted by acceptance/rejection date descending and trade proposed date ascending :
- Proposed date, accepted/rejected date, Trade status, Response Time in days, my role, proposed item, desired item, other user's nickname, link to trade details
- END

View Trade Details

Task decomposition

Lock Type - Read-only on USER, ITEM LISTING Read and Write lock on Trade Table
Number of Locks - Three
Enabling Conditions - Log In, View Trade History
Consistency (ACID) - Not needed as it is available only to the user
Frequency - 200 views

Subtasks - Mother task needed. Decomposition not needed.



Abstract code

- BEGIN
 - Get users' details from USER
 - Get items details from ITEM LISTING
 - Get Trade details by USER, ITEM LISTING
 - Display trade details: proposed date, accepted/rejected date, response time in days, trade status, user's role
 - Display user details (counterparty): nickname, (Calculate User Distance) IF trade status is accepted
 - Display first name, email
 - Display proposed item: Item Number, name/title, game type, condition,
 - IF description, piece count, platform, media is not null, display them
 - Display desired item: Item Number, name/title, game type, condition description
 - IF description, piece count, platform, media is not null, display them

END