Professor: Yun Huang

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Course: IST 659

PROJECT DESIGN REPORT

ONE FOR ALL

Abstract: The project focuses on creating a common platform for students, residents and store owners alike, in Syracuse, to mutually benefit from each other. There is already a website for off campus housing – 'orangehousing.com' and enough e-commerce platforms for students to capitalise on, for their day-to-day livelihood. This is a mix and match of the salient features of both these applications.

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PROJECT SUMMARY:

Background –

International students, particularly those from China, Thailand, Japan, India, Sri Lanka, etc. prefer to spend less on the living aspect of bachelors or masters study, and by renting a place outside campus, the cost of living reduces by 60% atleast. It's always chaotic while trying to figure out which product is economical to buy as there are many stores and sources to buy it from. Currently, there is no such system in Syracuse wherein product prices can be compared and bought online through a common marketplace.

With this system in place across all regions in Syracuse, students can make a well-informed choice on their place of residence. Students can also make a checklist of items to buy for the house and order the same, so that it is delivered at their doorstep at the time of arrival (especially in case of incoming students). Students can buy the products from residents – owners or tenants, or from store owners – supermarkets, malls or departmental stores. They are given special student discounts which vary with the product. A student can connect with another fellow student via social media to be updated with the coursework, understand current market situation or even to network and share viewpoints.

Designed Solution –

- A student can connect with his fellow peers via a social media platform like LinkedIn, Facebook, etc.
- The student can also access a resident's details to check commodities which can be bought directly via a garage sale, or to enquire about housing.
- Students can access store details to compare and figure out where to buy the product from.
- The residents can access a student's details to contact the students directly if needed, to inform about house rules or any other house related queries.

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- The residents can sell their products to students for a certain price after discount calculation.
- The resident can also access store details to buy products from a store – be it malls, supermarkets or departmental stores.
- Store owners can access the students details to contact them for any recent buys or promotional student offers.
- There is a give and take of products between students, residents and store owners through a ternary relationship.
- The owner of the house can provide details on the rooms that are for sale/ sublet/ leased. Along with this, the amenities provided for each house is also mentioned.

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TABLES & ATTRIBUTES:

DATA OBJECT: **CHECKLIST FOR USERS**	**This database contains all the tables and relations that provide lucrative ways for students to find their resources in and around school campus.**
USER	**Contains generic user information with registration date.**
• **USER ID** • First Name • Last Name • Gender • Age • Unique phone number • Datestamp	PK: Each user is assigned an auto generated unique user ID. The 3 primary users of this database are: • Students • Residents • Store Owners
LOGIN	**Contains login credentials for users.**
• **USER ID** • Primary email ID • Password	PK: Each user is assigned an auto generated unique user ID. FK: Associated with the PK of USER table. Login credentials are maintained separately for each user, so that if there are any compliance concerns, changes can be made only in this table.
STUDENT	**Child entity of USER. Buys products from residents or stores. Rents/buys a property.**
• **Student_ID** • Type (Current/New/	PK: Each student will have a unique ID to be identified with. FK: Associated with the PK of USER table.

Alumni) • Program of Study	Gives details about the students in their intended study program, who are: • Currently enrolling. • Already enrolled and have finished a semester. • Alumnus.
SOCIAL MEDIA	**Creates connections among peers to familiarize with student conditions.**
• **Connect ID** • ID1 • ID2 • Media type	PK: Social connection ID is the unique ID with which each student connects with another student of the same school. FK1: Associated with the PK of 'STUDENT' table. FK2: Associated with the PK of 'STUDENT' table. This is an associate table used to connect one student with another via social media platforms like Skype, LinkedIn, Facebook, Twitter, etc.
STORE	**Child entity of USER. Sells the products to students or residents**
• **Owner_ID** • Type (Supermarket/Departmental store/Mall) • Location_Link	PK: The store owner's ID is used as the unique ID. Each store has its own unique ID. FK: Associated with the PK of USER table. Provides store's details along with the location of the store on the map via a URL.

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RESIDENT	**Child entity of USER. Contains the resident's personal details.**
• **SSN_Number** • Status (Owner/Tenant) • Bankaccount number • Garage_sale_YN • Number of houses	PK: The SSN number of the resident is used as the unique identification. FK: Associated with the PK of USER table. The resident could be an owner or a tenant of a property. The resident can sell used or new products to students or return them to the store. Residents can also lease or sell their property to students.
MAIN PRODUCT	**Contains main product group details.**
• **Product_ID** • RES_SSN_No • Owner_Lic_ID • Type of product	PK: Each product group has a unique product ID. For example, groceries will have a separate group ID from beverages. FK1: Associated with the PK of RESIDENT table. FK2: Associated with the PK of STORE table. This is an associative entity that stores the product group details
PRODUCT ITEM	**Contains item details of the product.**
• **Product_Item_ID** • Prod_ID • Stud_ID • Item Name	PK: Each item in a product group has a unique ITEM ID. FK1: Associated with the PK of MAIN PRODUCT table. FK2: Associated with the PK of STUDENT table.

• LPU (List price/unit) • Quantity • Student discount • Price (USD) • Delivery date	This is an associative entity that stores the product item details. Based on the number of quantities of the item purchased by the student, price of the product sold is calculated based on formula: Price = (LPU * quantity * (100-Student discount)) / 100
HOUSE	**Contains details of the house being rented/sublet/sold by the owner/tenant.**
• **House Code** • SSN_Number_Owner • House number • Street • City • Pincode • Number of rooms • House location link	PK: Every house that the resident possesses is identified with a unique ID. FK: Associated with the PK of RESIDENT table. The house to be leased/ sold to a student is provided in this table with relevant details along with the URL of the map location.
ROOM	**Contains details of the room, up for grabs**
• **ROOM_ID** • Room Avail_yn • Availability start date • Room dimensions	PK: Each room in a house is associated with a unique ID. FK: Associated with the PK of HOUSE table. Each house will have only 1 amenity package provided.

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• Room description • Quoted price (w/o utilities) (USD) • Negotiable price_yn • House code	
AMENITIES	**Contains details of the amenities provided in each house.**
• **AMENITY_CODE** • Garage_yn • Single parking_yn • Laundry_yn • Fireplace_yn • House code	PK: Each house is associated with a unique amenity code for one combination of attributes in the table. FK: Associated with the PK of HOUSE table. Each house will have only 1 amenity package provided.

Note: *PK → Primary Key*

FK → Foreign Key

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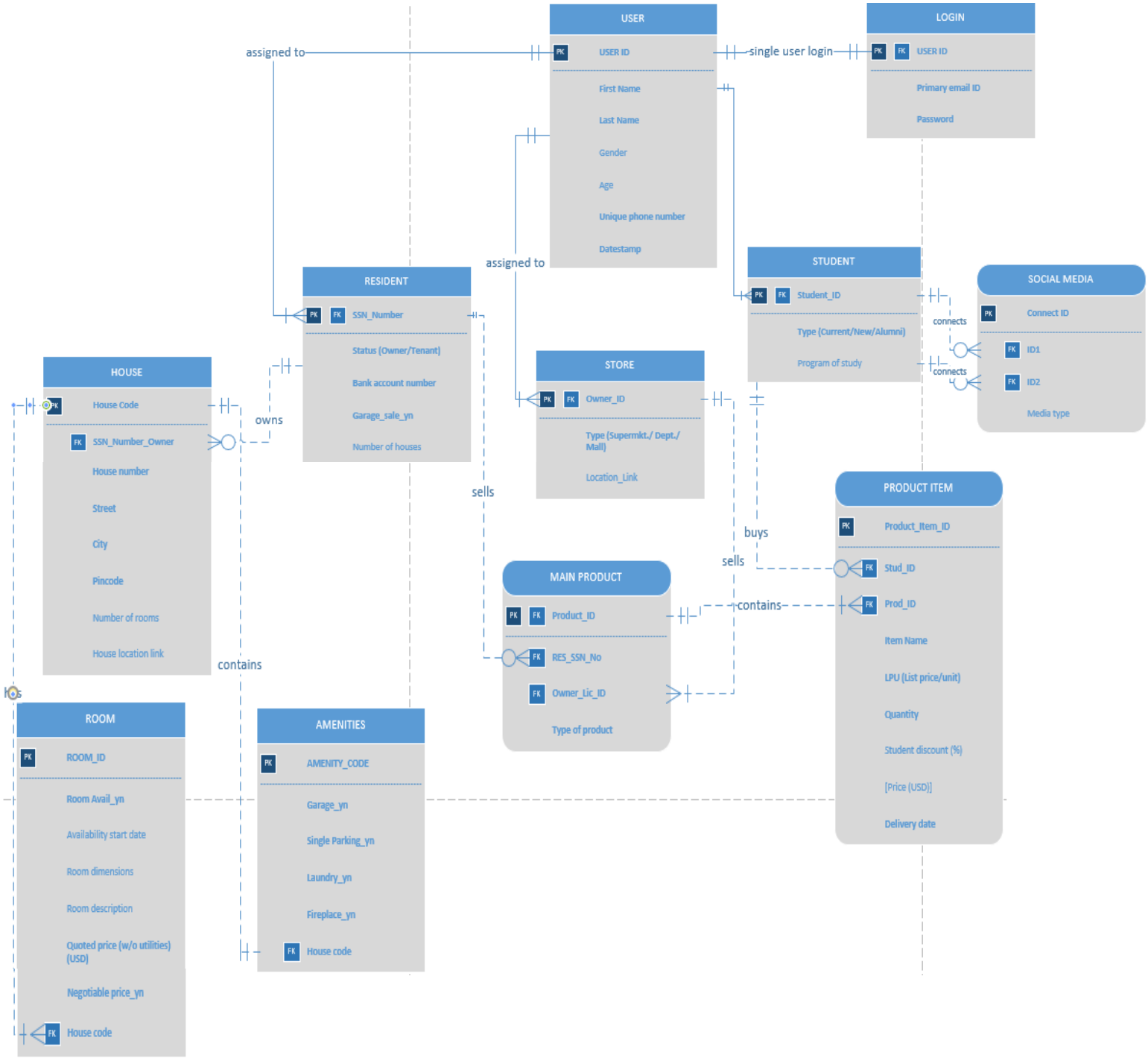
RELATIONAL DATA MODEL:



{Note: I have attached the Visio drawing in blackboard as well, in case this is not clear. Or, please zoom in for clearer image.}

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BUSINESS RULES:

1. There are 3 types of users: Students, Residents, Stores. A user ID is unique for each of them, and there is atleast one user ID for each of the users.
2. Each user has one and only one user login. A login is created for one and only one user at a time.
3. Each student may or may not connect with one or more students through social media. The students are identified either as current/new/alumni.
4. Students, residents and store owners are connected through a ternary relationship.
    a. Atleast one main product is sold by the store owner. The main product is received by one and only one store owner.
    b. The main product consists of atleast one product item part. Each product item is a part of one and only one main product.
    c. Each product item part is bought by one and only 1 student. The student buys may or may not buy a product item part.
    d. The resident may or may not sell a main product. The main product is received by one and only one resident.
5. Each resident (owner) may or may not own a house. Each house belongs to one and only one resident. *Assumption: Only owners who are residents will own a house. Each resident can only sublet/lease/sell one house at a time. Residents cannot deal with housing with other residents, it is limited only to students.*
6. Each house will have atleast one room. A room belongs to one and only one house. *Assumption: All rooms are bedrooms.*
7. Each house will have one and only one amenity package. The amenities can be a part of one and only one house.

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MAJOR DATA QUESTIONS:

The users of this system are:

- Students
- Residents
- Stores

STUDENTS query the database

Functions –

- Students can query product item. They can add/delete/modify product items and quantities as per their needs.
- They can view details about store and store owner.
- They can view details about residents, and can query resident table.
- They can view/add/delete/modify their own records from student table. And can also query social media table to communicate with other students through media platforms with view/add/modify.
- They can view/update ‘room’ table details.
- Only View access to ‘house’ and ‘amenities’ table details.

Constraints –

- Students cannot add/delete/update resident details.
- Students cannot add/delete/update store details.
- They cannot add/delete product group as well, and do not have direct access to main product group.
- No add/delete ‘room’ table details.
- No delete function on ‘social media’ table.

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RESIDENTS query the database

Functions –

- Residents can view/add/delete/update ‘house’ table details.
- They can view/add/delete/update their own personal details in ‘resident’ table.
- They can view/add/delete/update main product details.
- They can query the ‘student’ database to view student details.
- Store details can be queried to only view store owner details.
- They can view/delete/update/add ‘room’ table entries to mention room details.
- They can view/delete/update/add ‘amenities’ table entries to mention the amenity combination comprising of garage, single level parking, fireplace, laundry.

Constraints –

- Product item table cannot be added/updated/deleted by the residents. Only view is possible.
- Store table cannot be added/updated/deleted by the residents.
- No access at all to ‘social media’ table.

STORES query the database

Functions –

- Store owners either from supermarkets, malls or departmental stores can sell their products to residents or students.
- So, stores can query resident table. They can only view ‘resident’ table details.
- They can query ‘student’ table as well with only ‘view’ possible.
- They can view/add/update/delete their own records in ‘store’ table.
- Stores can query ‘product item’ to sell his/her products to residents and students. View/delete/update/add is all possible.

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Constraints –

- They do not have any access to ‘house, room, amenity’ table at all.
- Add/update/delete is not possible to ‘resident, student’ table.
- No access at all to ‘social media’ table.