

System Design Document

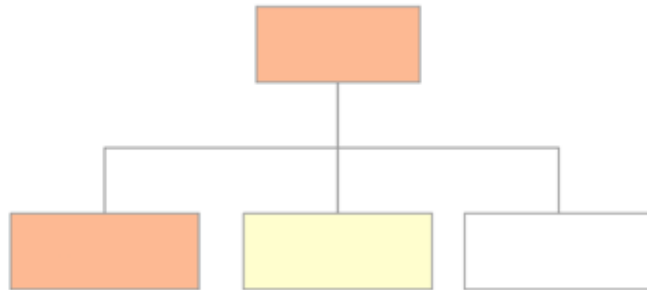
Team Red (Student Nutrition Mobile App)

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Date: 25 October 2016

Preface

This document describes the system design for the Student Nutrition Mobile app project. It decomposes the system into a series of modules, components, and subcomponents, and describes the function and relationship of each of these parts.

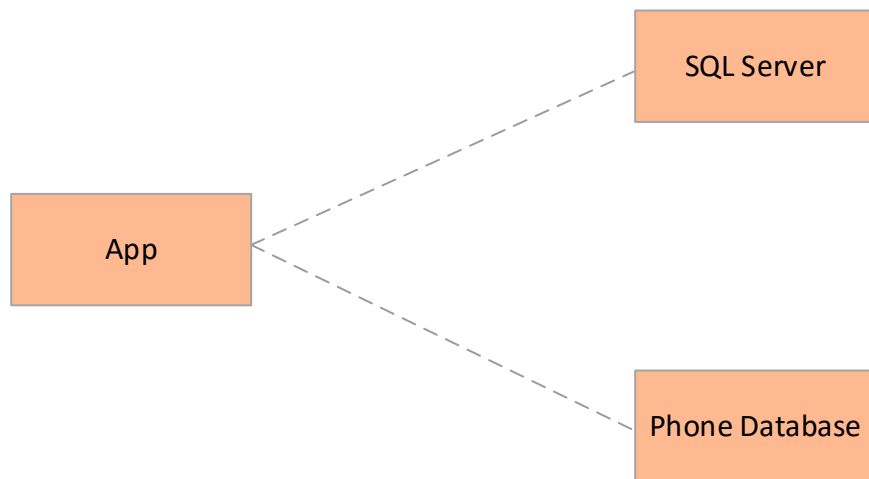


A few notes:

- Modules are denoted using graphical boxes.
- Relationships are denoted with lines.
- The boxes are colored-coded to match the priority of the given module. A reddish-orange box means critical or high priority. A light yellow box means low priority. A white (unfilled) box means nice to have, that is, lowest priority.
- Nice to Have modules, components, and subcomponents will be shown as a subcomponent of a critical or low priority component, but will not be shown as having subcomponents.

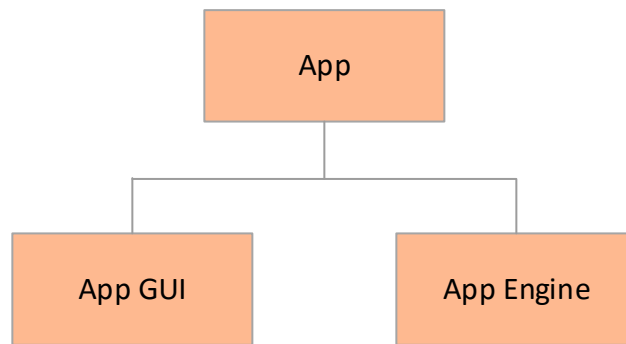
Level 1

The Student Nutrition Mobile app project is divided into three main components - the mobile app, a SQL server, and a database on the mobile device. The mobile app communicates with both the server and database independently.

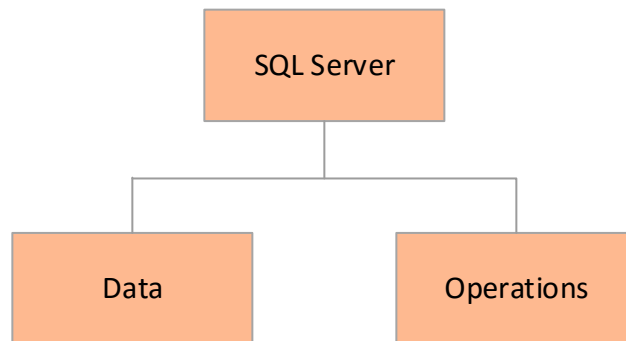


Level 2

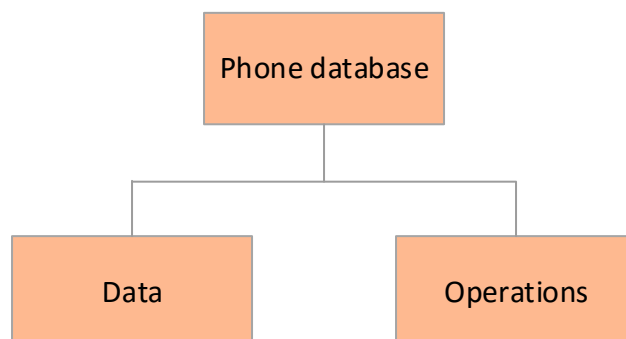
The mobile app is divided into two modules - the GUI and the App Engine. The GUI is responsible for the visual display of the program on the mobile device, while the App Engine is responsible for all operations on data.



The SQL server is divided into two modules - data and operations. Data is what is stored on the server, and operations are what can be done to that data.

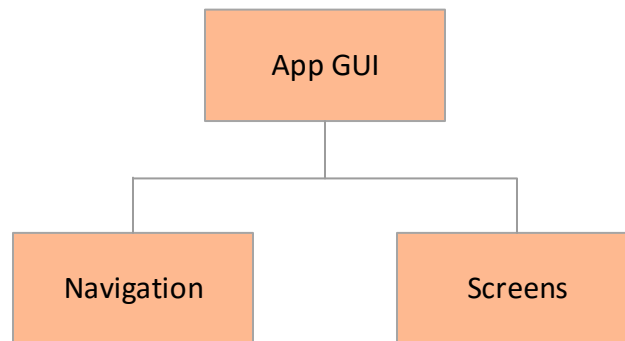


The Phone Database is divided into two modules - data and operations. Similar to the SQL Server, data is what is stored in the database, and operations are what can be done to that data.

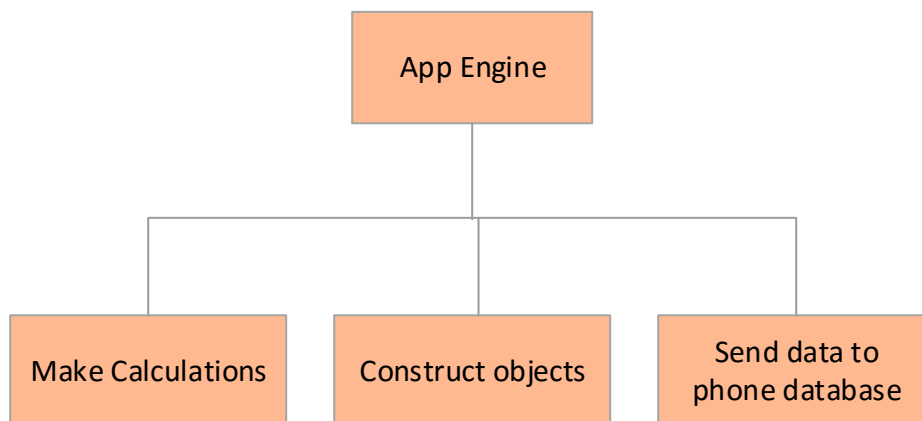


Level 3

The GUI is divided into two components - navigation and screens. Navigation involves all of the backend operations needed to switch between screens and to initialize events. The screens component includes all of the different screens the mobile app contains as well as the GUI components visible on a given screen.

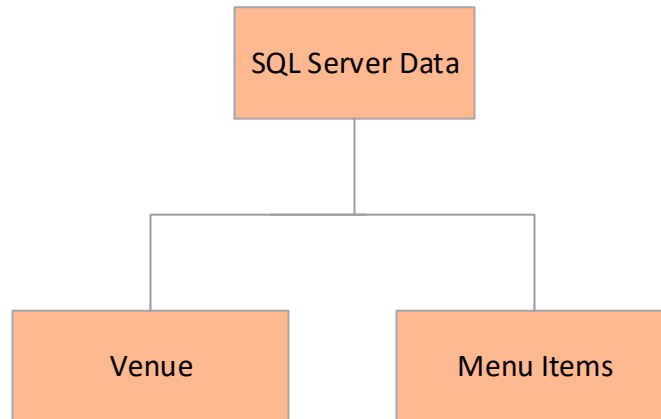


The App Engine is divided into three components - Calculations, Construction, and Sending. Calculations include any operation on objects which are necessary to produce usable values for the GUI. Construction involves forming objects for use in the GUI and in calculations. These objects are constructed from data pulled from the server or database. Sending focuses on formatting objects into a format usable by the database.

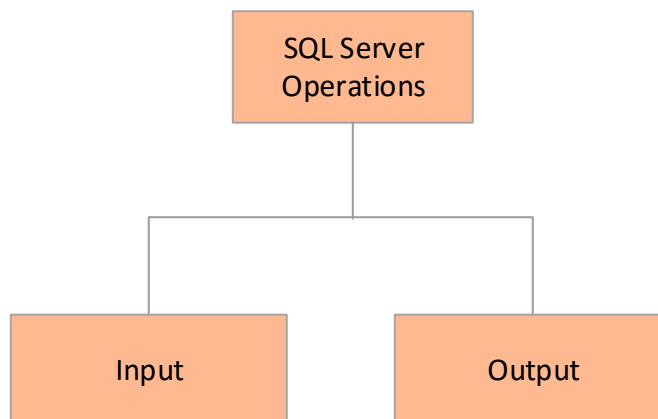


Level 3

The server data module is made up of two components - venues, and menu items. Venues are dining establishments, restaurants, and eventually, grocery stores. Essentially, anywhere food can be purchased. Menu items are the food items available at a given venue.

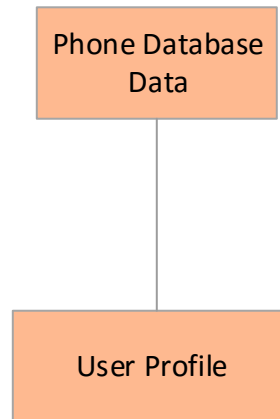


The server operations module is made up of three components - Input and Output. The input component focuses on data being added to or modified on the server, in the case of adding new venues or additional food items. Output focuses on sending information to the mobile app.

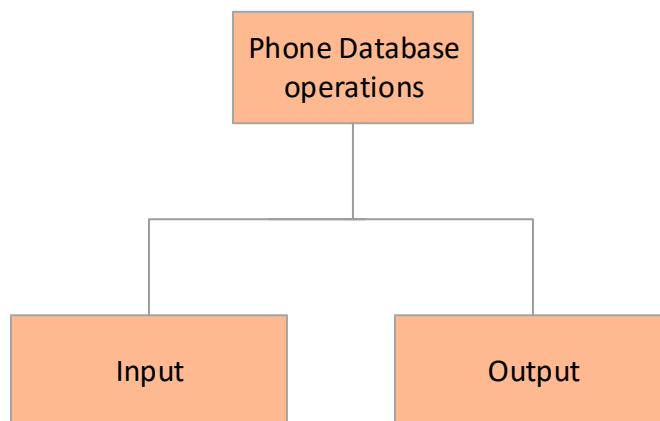


Level 3

The Phone Database Data module has a single component - the user profile. A user profile stores all of the user's information on the phone for safekeeping in between using the app.



The Phone Database operations module has two components - Input and Output. Input focuses on data being added to the database. Output focuses on pulling data from the database, and on data being properly formatted to send to the mobile app.



Level 4

The Screens component of the App GUI is made up of the following subcomponents, shown in relation to each other:

- Dashboard, which is the main screen of the app from which all other features are accessible;
- Add a Meal, which is the screen dedicated to recording the main information about a meal;
- Meal for a Date (Today), which is the screen dedicated to displaying the meals a user has recorded for the current date;
- Percent Daily Values (PDV), which is the screen dedicated to displaying a user's nutrient amounts and percent of daily value that amount represents, based on the items in recorded meals;
- Settings, which lists all of the options a user can customize;
- Recap, which displays a list of the past seven days, from which a user can select a date to view the meals recorded on that date.

Add a Meal screen allows users to access two additional screens - Meal Details, and Menu Item Percent Daily Values (PDV).

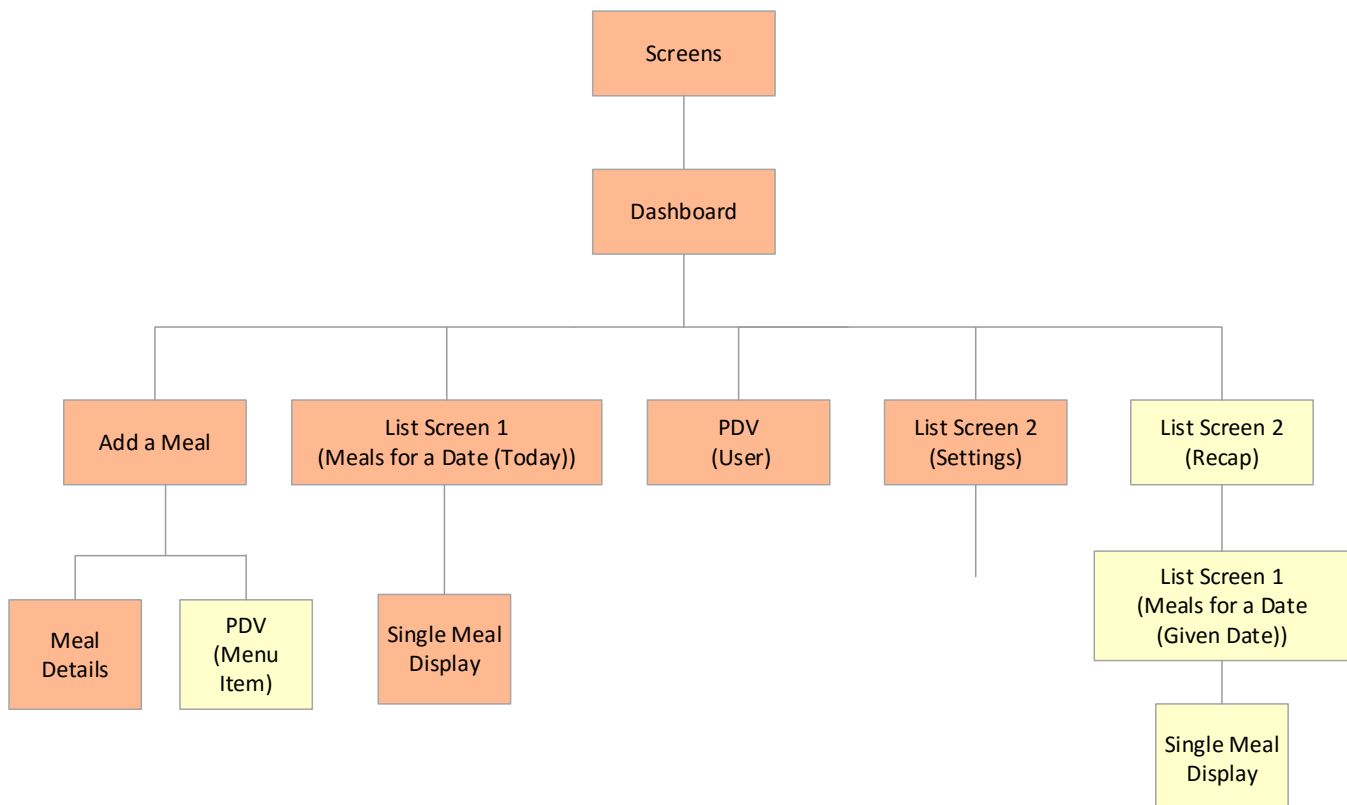
- Meal Details allows a user to enter additional information about specific menu items added to the meal, such as servings.
- Menu Item Percent Daily Values displays the nutritional information for a given menu item, include nutrient amounts and percent of daily value that amount represents.

Meals for a Date (Today) allows users to access the Single Meal information screen.

- Single Meal screen displays the detailed information about an individual meal on a single day

Recap screen allows users to access two additional screens - Meals for a Date (Given Day), and Single Meal information.

- Meals for a Date (Given Day) is the same format as Meals for a Date (Today), except a different date is used
- Single Meal screen displays the same sort of information as the Single Meal screen accessed from Meals for a Date (Today)

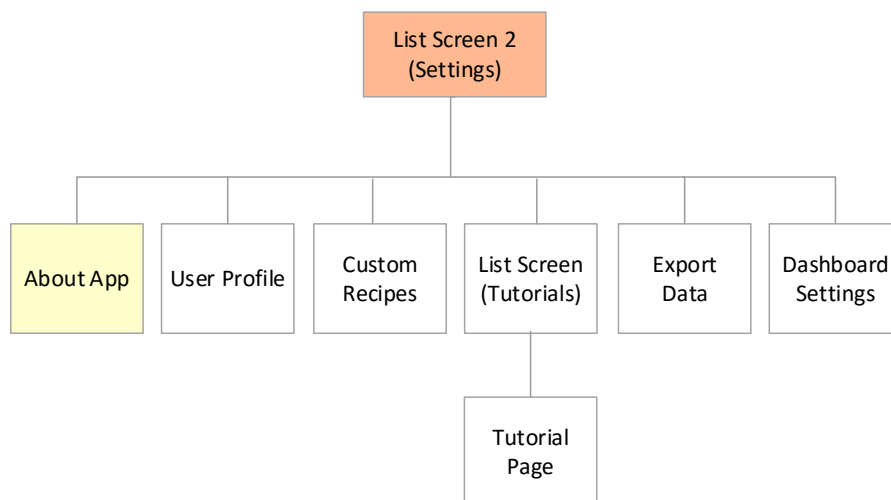


Level 4

The Settings subcomponent of the APP GUI provides access to a number of additional screens. These include the following:

- About Apps screen, which displays information about the application itself (i.e. author, version, etc.)
- User Profile screen, where users can input personal information to customize Percent Daily Value measurements
- Custom Recipes screen, where users can input and modify recipes
- Tutorials screen, where users can step through tutorials designed to explain the functionality of the app
- Export Data screen, where users can export recorded meal data in a variety of formats
- Dashboard Settings screen, where users can customize what features are displayed on the Dashboard

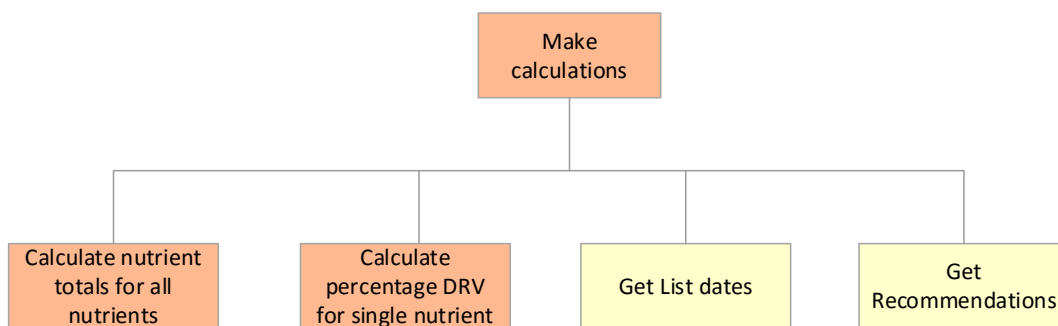
The Tutorials screen allows users to access individual screens dedicated to specific tutorial offerings.



Level 4

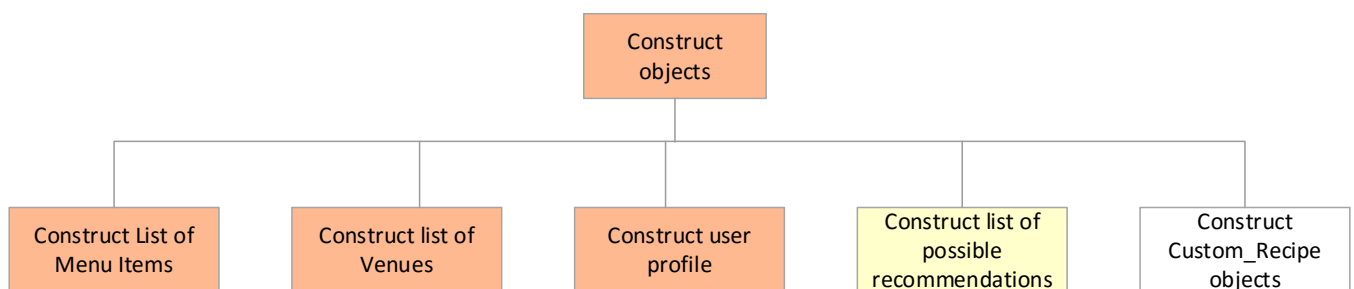
The Calculations component of the App Engine is divided into four subcomponents - Calculating Nutrient Totals, Calculating Percentage Daily Values (PDV), accessing a list of dates, and accessing specific recommendations.

- Calculating nutrient totals allows the app to determine the total amounts of each nutrient, given a recorded meal or series of meals.
- Calculating PDV allows the app to determine what percentage of a user's dietary needs were achieved by the recorded meals.
- The list of dates allows the GUI to correctly display the previous 7 days or to determine which dates correspond to the previous month, for purposes of other calculations.
- The recommendations are the two or three chosen messages to display to users, based on their lowest PDV.



The Construction component of the App Engine is divided into five subcomponents - Constructing a list of menu items, constructing a list of venues, constructing a user profile, constructing a list of possible recommendation, and constructing custom recipes.

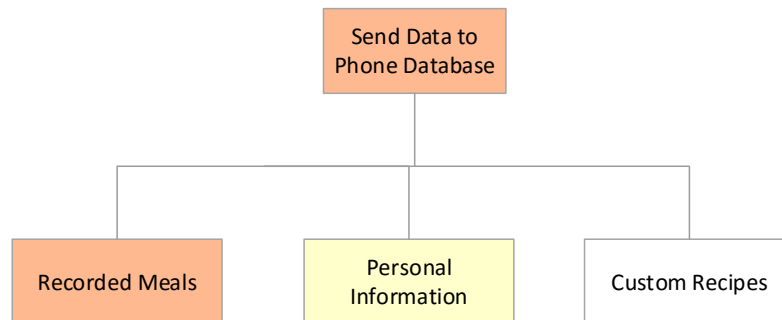
- The List of Menu Items is necessary for supplying information for the GUI, given a chosen meal location
- The List of Venues is necessary for supplying information for the GUI to give users a choice of venues to select as the location of their meal
- Constructing a User Profile allows the app to format database information into object oriented programming
- The List of Possible Recommendations is created with messages for each possible nutrient, in case that nutrient is the lowest
- Constructing custom recipe objects is necessary to allow the user to customize meals and menu items



Level 4

The Sending component of the App Engine is divided into three subcomponents - recorded meals, personal information, and custom recipes.

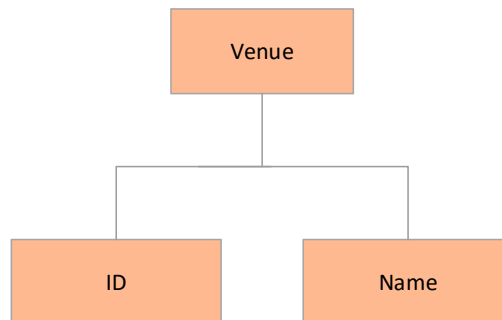
- Recorded Meals allows the app to send user meal information to the database
- Personal Information allows the app to send user-supplied personal information or changes to personal profile information to the database
- Custom Recipes allows the app to store custom recipes in the database



Level 4

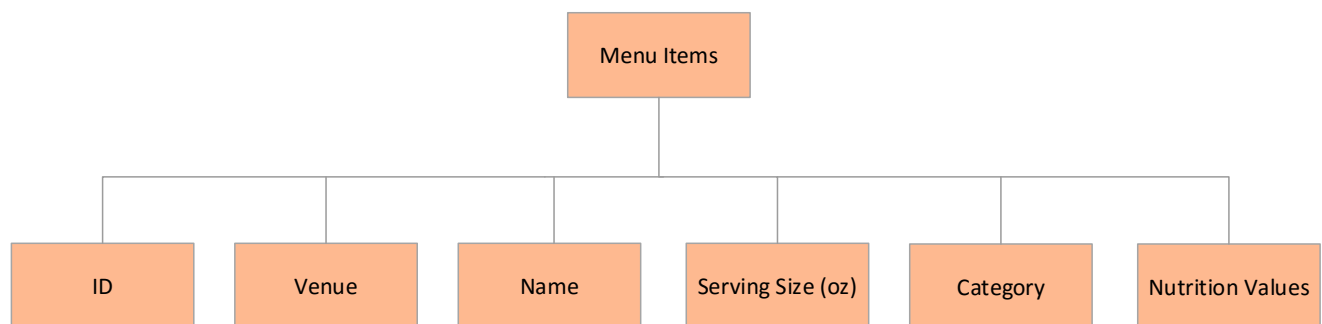
The SQL Server Data Venue component consists of two subcomponents - ID and Name.

- ID is the identify of the venue on the server
- Name is the name of the venue on the server



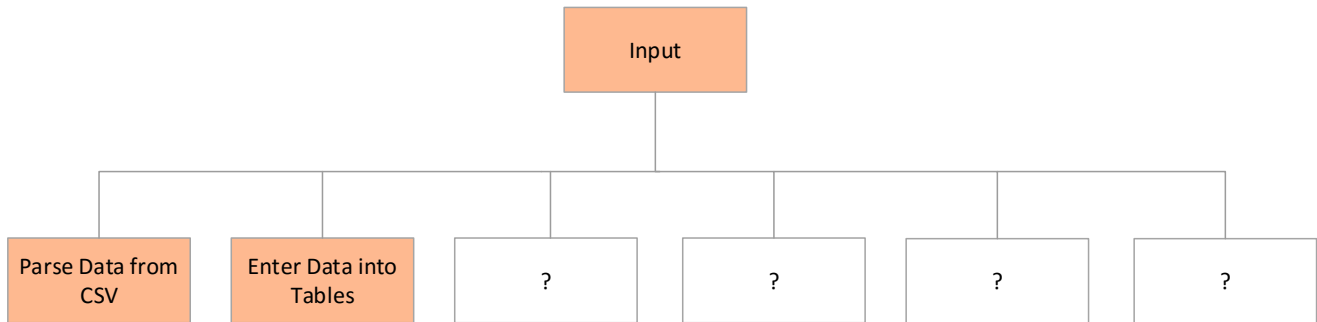
The SQL Server Data Menu Items component consists of the following subcomponents: ID, Venue, Name, Serving Size, Category, and Nutrition Values.

- ID is the identity of the menu item on the server
- Venue is the venue location the menu item is based from
- Name is the name of the item on the server
- Serving Size is the portion (in ounces) of the item
- Category is the food grouping the item is in (i.e. Drinks, Dessert, Entree, Side, etc.)
- Nutrition Values are the standard amounts of Nutrients a single serving of a menu item contains

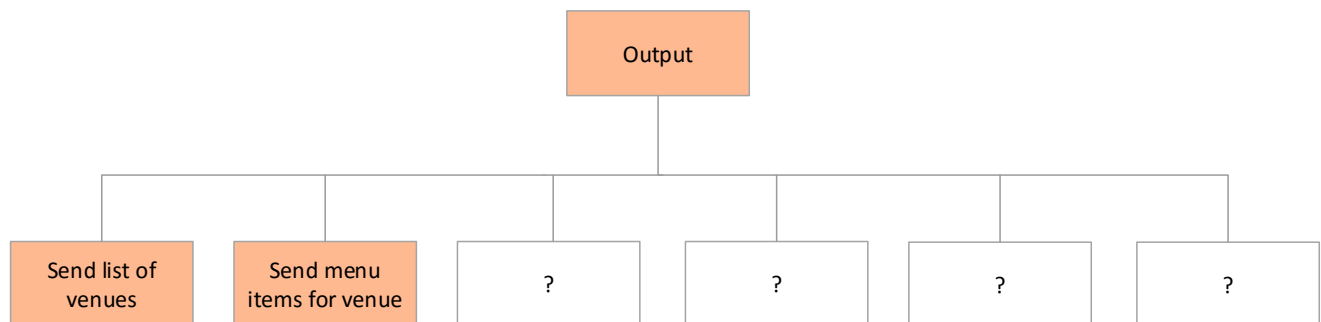


Level 4

The SQL Server Operations Input component consists of a number of subcomponents -



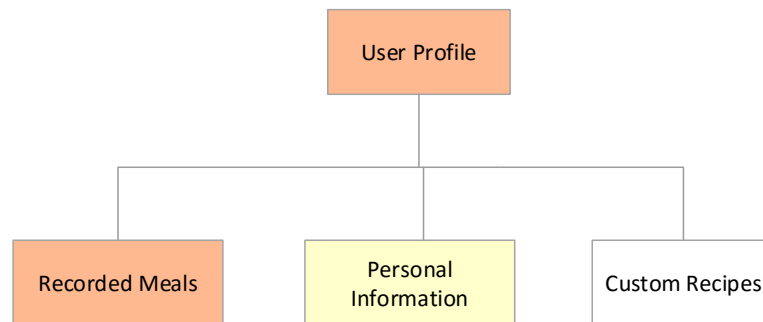
The SQL Server Operations Output component consists of a number of subcomponents -



Level 4

The Phone Database User Profile component has three subcomponents - Recorded Meals, Personal Information, and Custom Recipes.

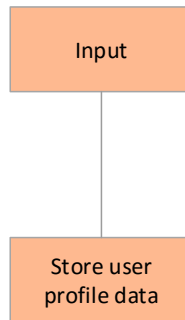
- Recorded Meals stores meal information from a user
- Personal Information stores user information
- Custom Recipes stores combinations of menu items a user creates



Level 4

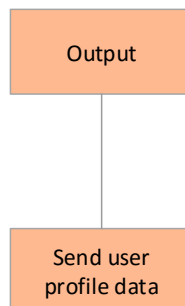
The Phone Database Input component has a single subcomponent - Store user profile data.

- Store User Profile Data takes information from the App Engine and formats it to store in the database



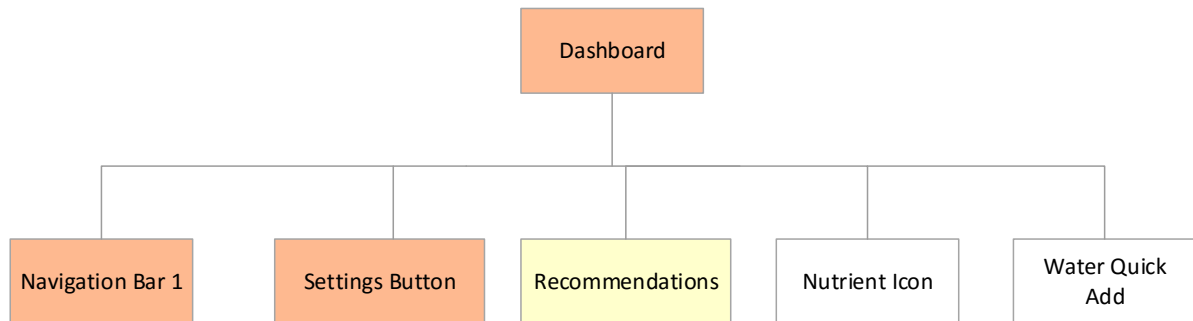
The Phone Database Output component consists of a single subcomponent - Send user profile data

- Send User Profile Data sends all the information the App Engine needs to construct a full user profile, including personal information and recorded meals

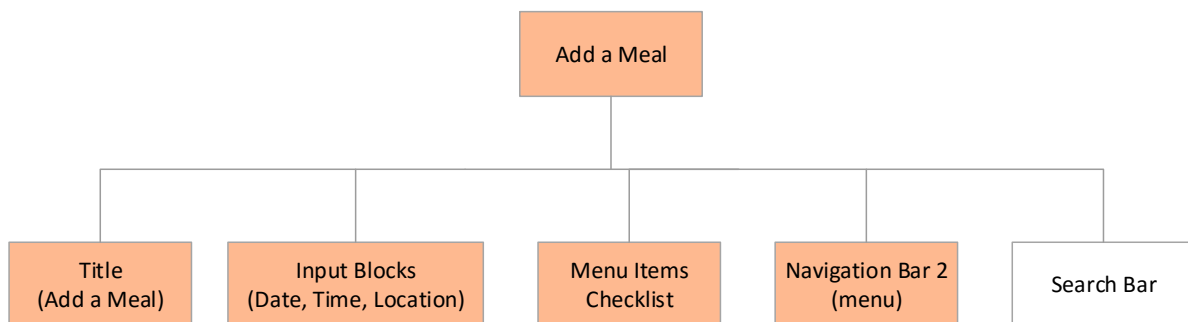


Level 5

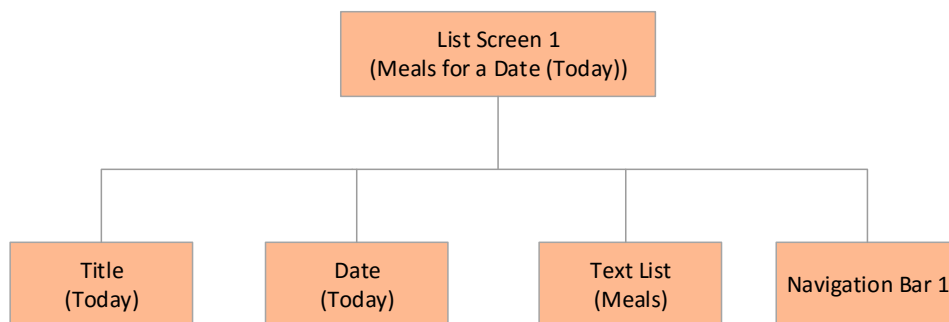
The Dashboard subcomponent of the App GUI consists of a number of subcomponents, shown below.



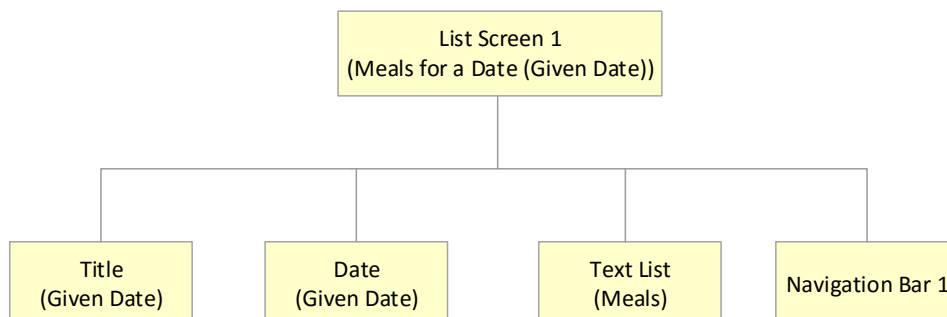
The Add a Meal subcomponent of the App GUI consists of the following subcomponents.



The Meals for a Date (Today) subcomponent of the App GUI contains the following subcomponents.

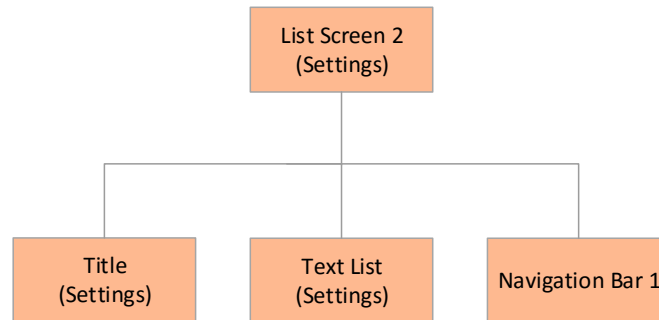


The Meals for a Date (Given Date) subcomponent of the App GUI contains the following subcomponents, and is slightly different from the Meals for a Date (Today).

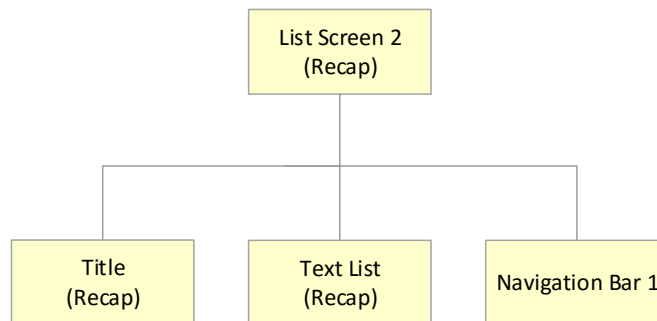


Level 5

The Settings subcomponent of the App GUI has the following subcomponents.

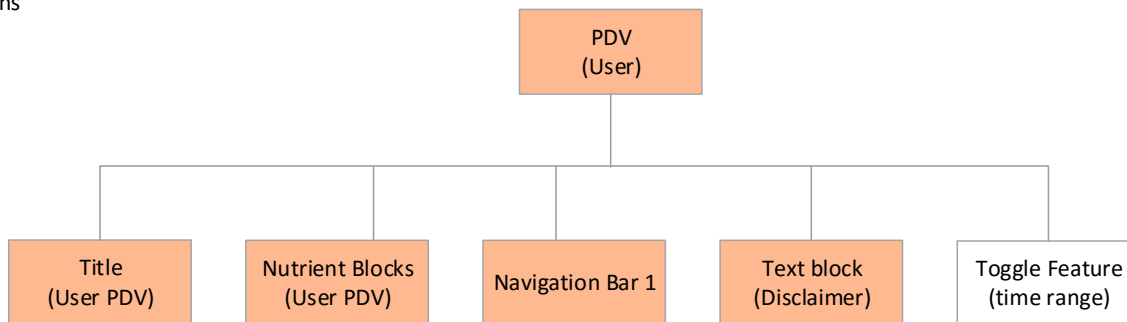


The Recap subcomponent of the App GUI has the following subcomponents.

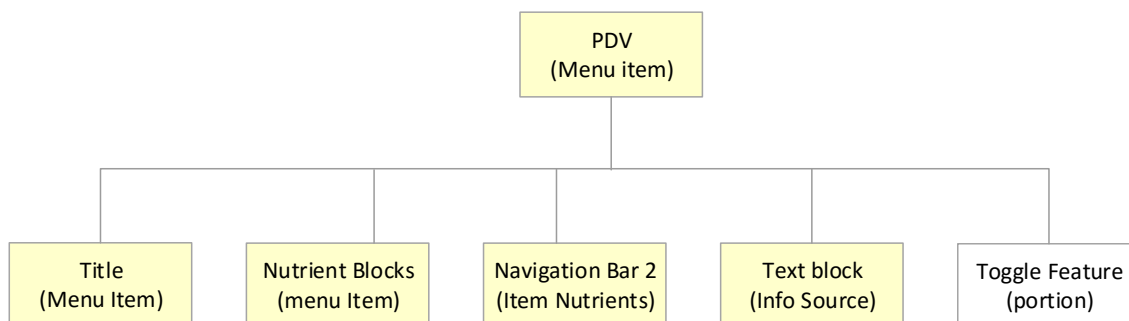


The Percent Daily Values (PDV) subcomponent of the App GUI has the following subcomponents.

Screens

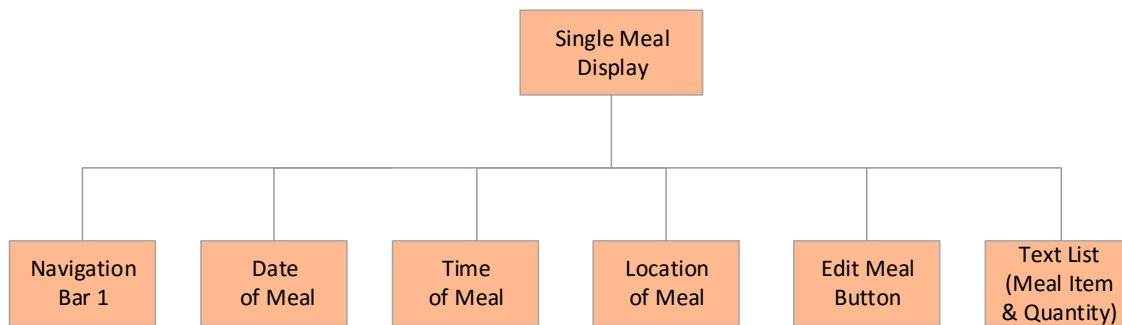


The Menu Item Percent Daily Values subcomponent of the App GUI has the following subcomponents.

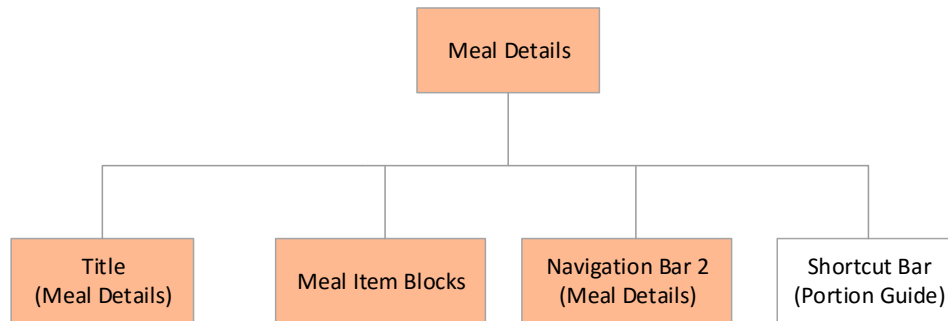


Level 5

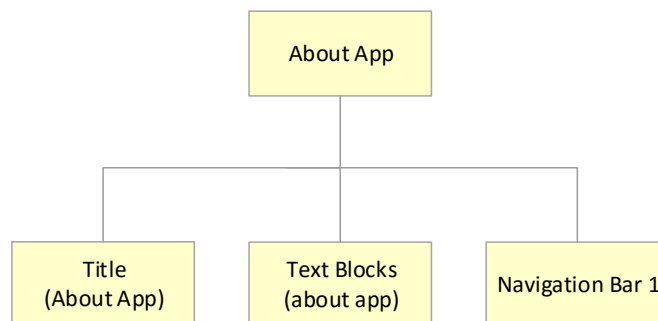
The Single Meal subcomponent of the App GUI consists of a number of subcomponents, shown below.



The Meal Details subcomponent of the App GUI consists of the following subcomponents.

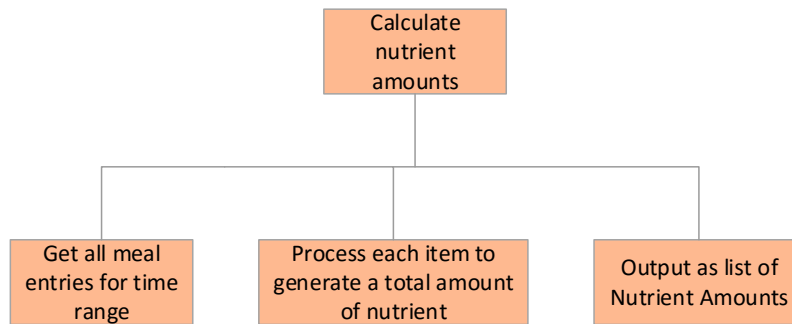


The About App subcomponent of the App GUI contains the following subcomponents.

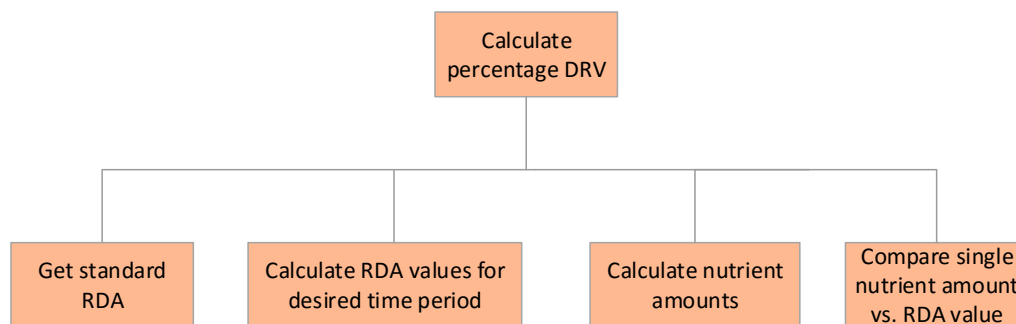


Level 5

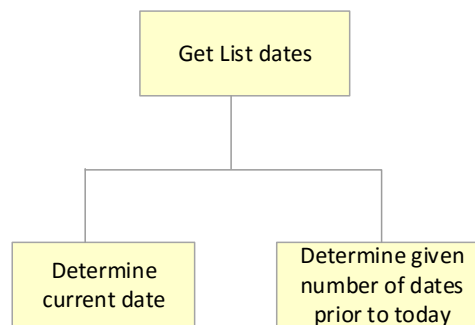
The Calculate Nutrient Amounts subcomponent of the App Engine has the following subcomponents.



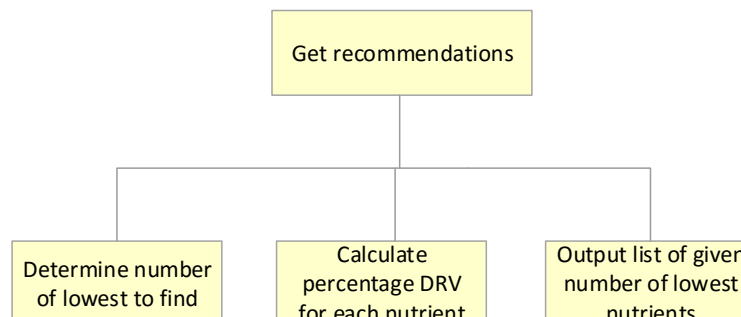
The Calculate Percent Daily Values (PDV) subcomponent of the App Engine has the following subcomponents.



The Get List of Dates subcomponent of the App Engine has the following subcomponents.

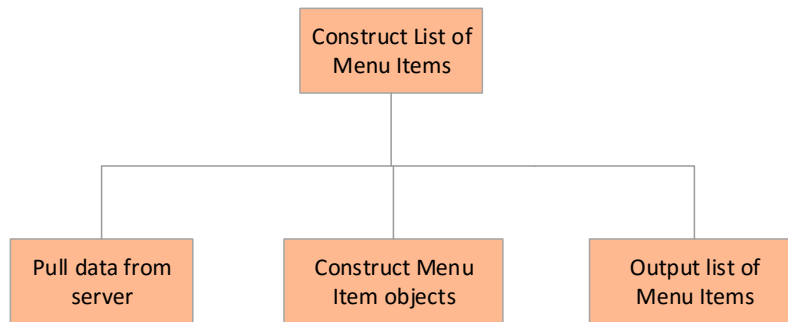


The Get Recommendations subcomponent of the App Engine has the following subcomponents.

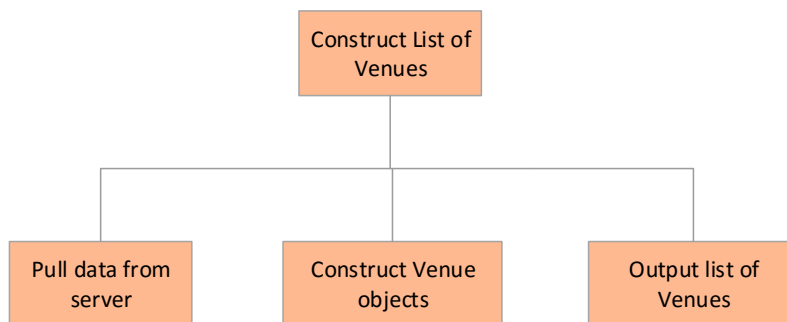


Level 5

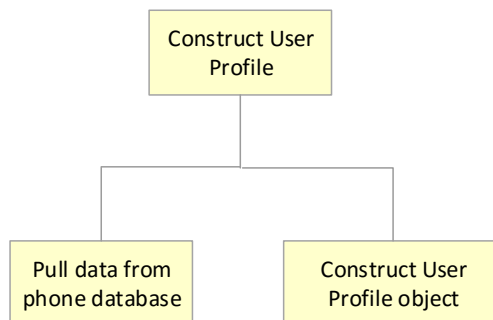
The Construct List of Menu Items subcomponent of the App Engine consists of a number of subcomponents, shown below.



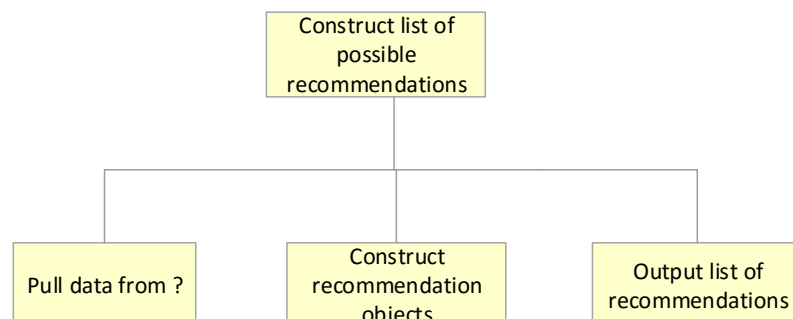
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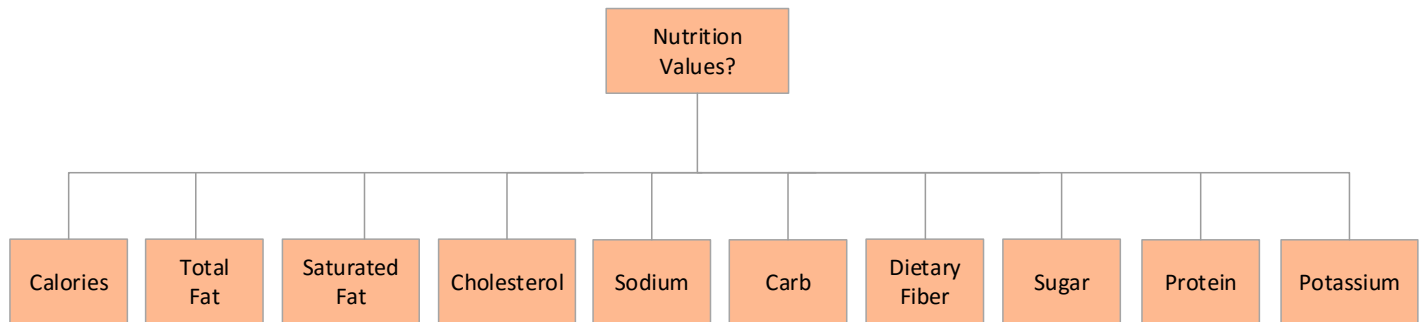


The Construct List of Menu Items subcomponent of the App Engine consists of a number of subcomponents, shown below.



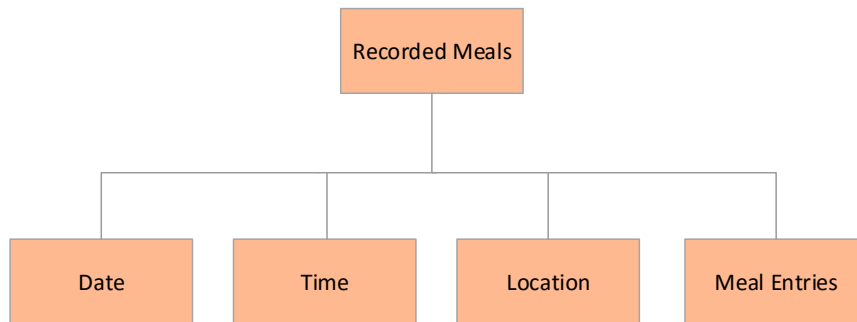
Level 5

The Nutrition Values subcomponent of the SQL Server consists of the following subcomponents.

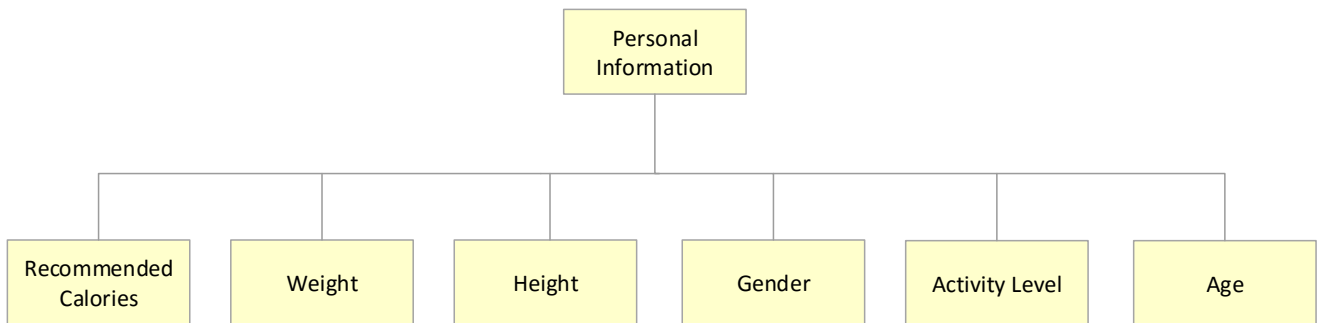


Level 5

The Recorded Meals subcomponent of the Phone Database consists of the following subcomponents.

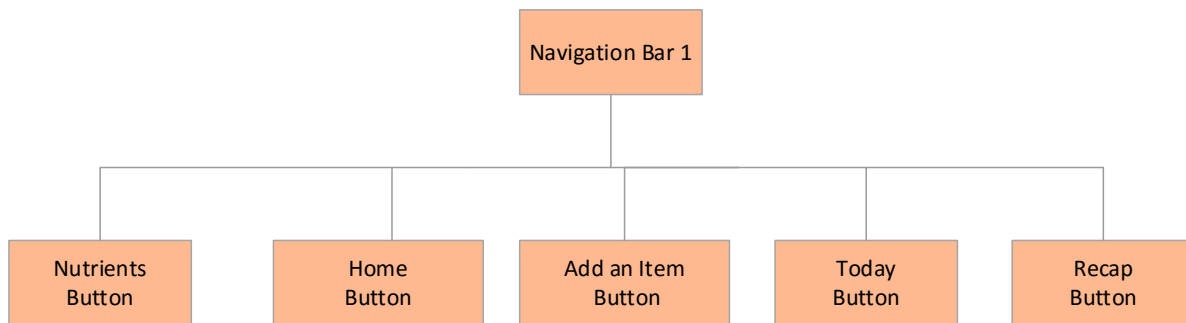


The Personal Information subcomponent of the Phone Database consists of the following subcomponents.

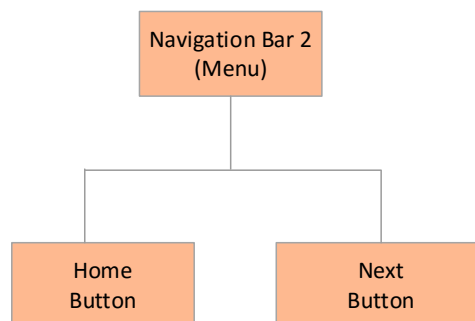


Level 6

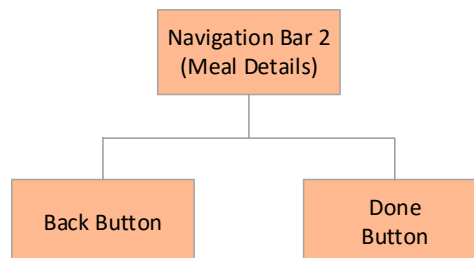
The Navigation Bar 1 subcomponent of the App GUI has the following subcomponents.



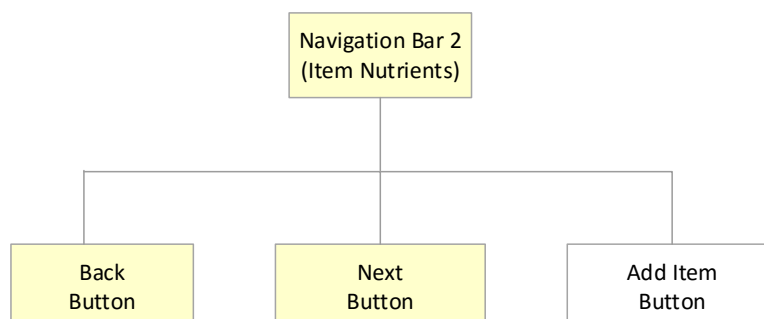
The Navigation Bar 2 (Menu) subcomponent of the App GUI has the following subcomponents.



The Navigation Bar 2 (Meal Details) subcomponent of the App GUI has the following subcomponents.

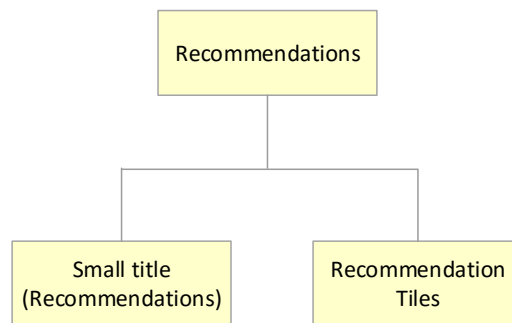


The Navigation Bar 2 (Item Nutrients) subcomponent of the App GUI has the following subcomponents.

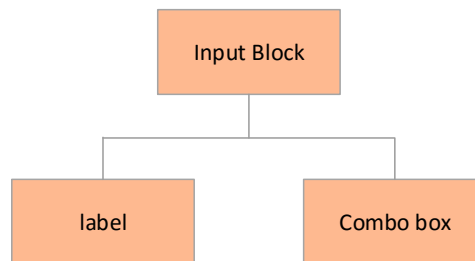


Level 6

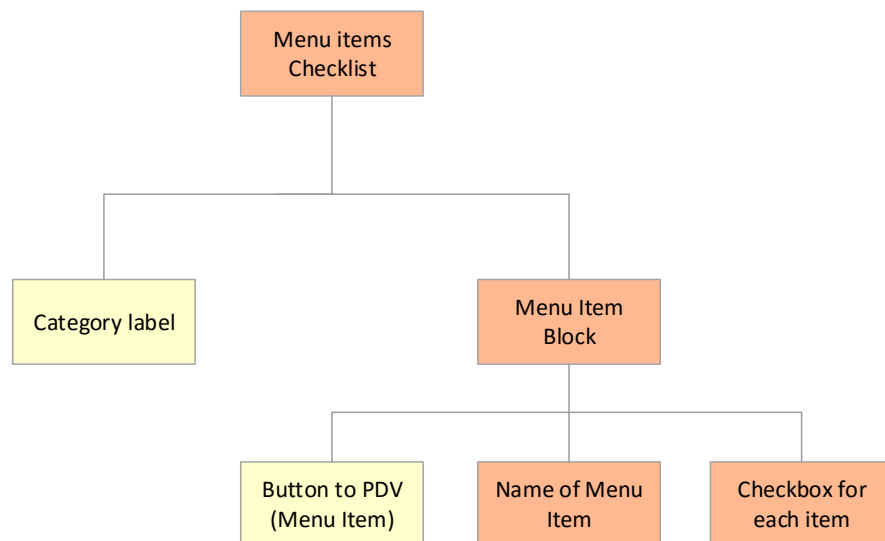
The Recommendations subcomponent of the App GUI has the following subcomponents.



The Input Block subcomponent of the App GUI has the following subcomponents.

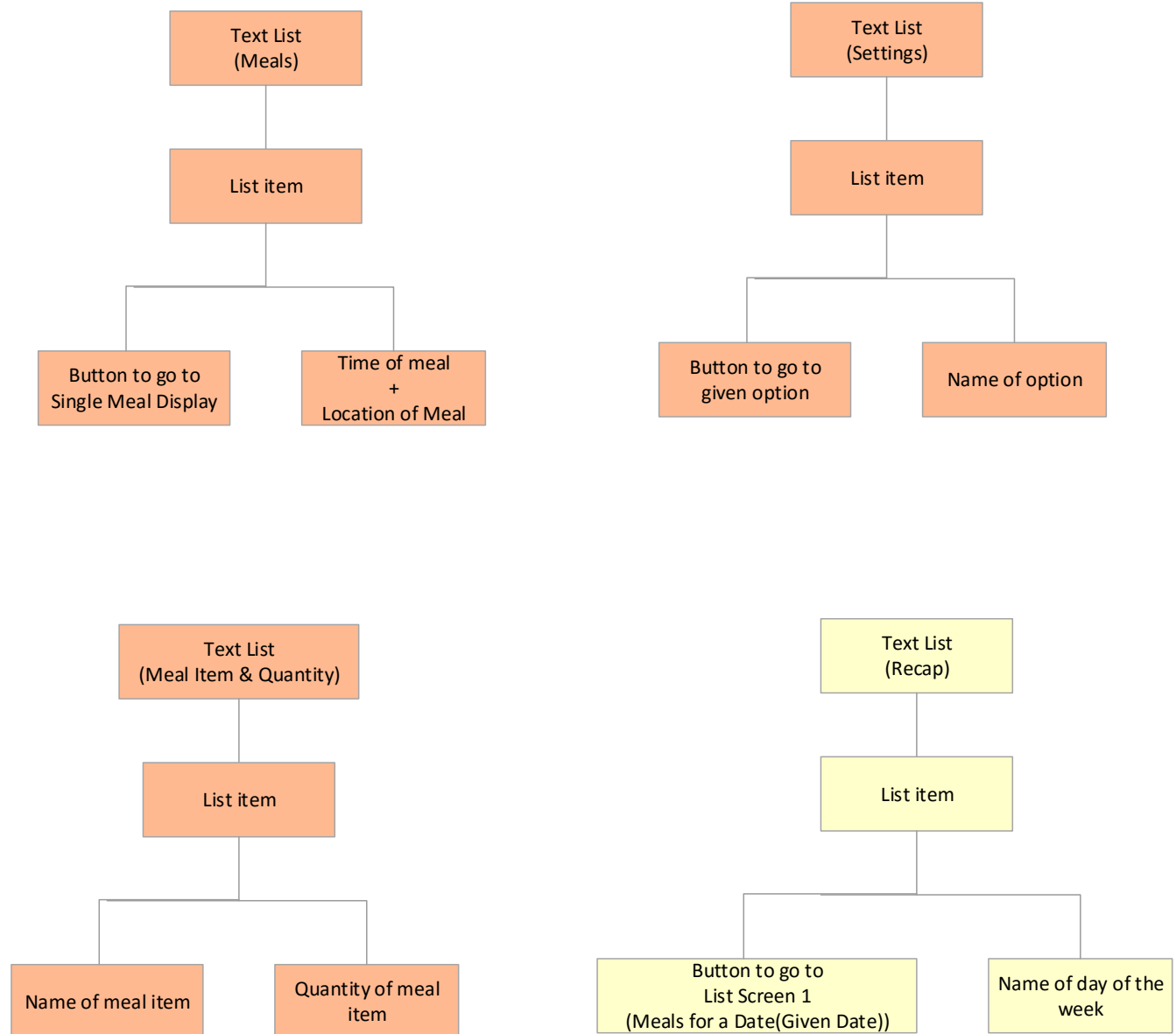


The Menu Items Checklist subcomponent of the App GUI has the following subcomponents.



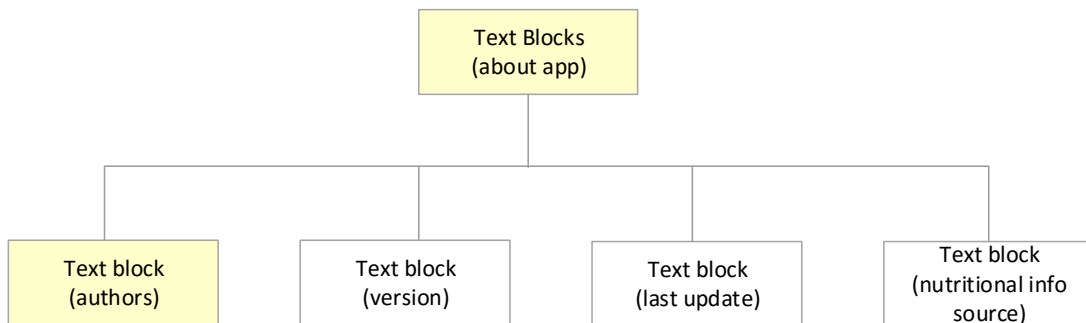
Level 6

The Text List subcomponent of the App GUI has the follow variations. Each variation is shown with its subcomponents.

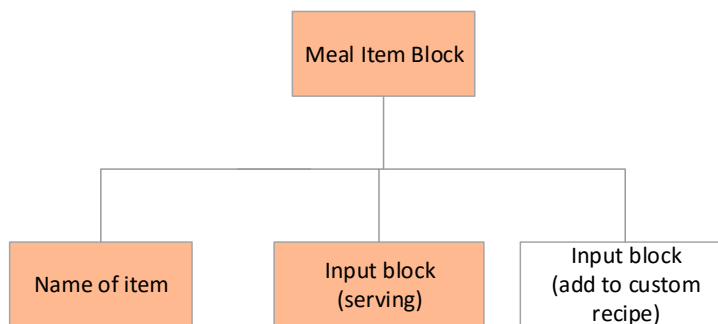


Level 6

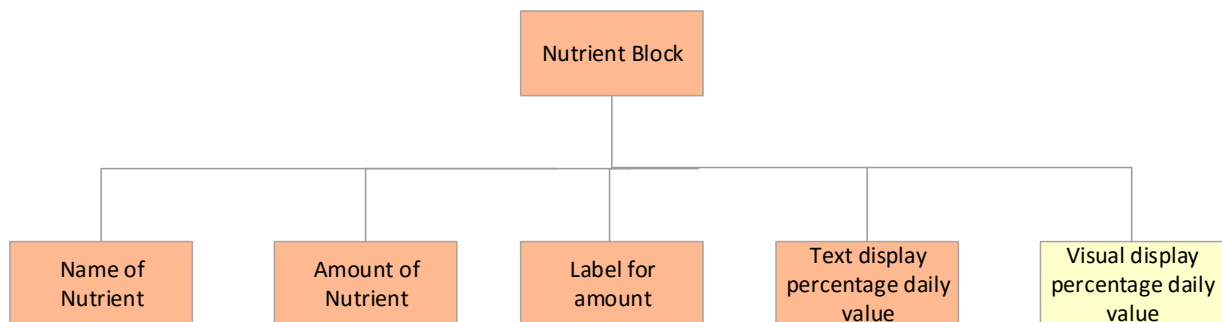
The Text Blocks (About App) subcomponent of the App GUI has the following subcomponents.



The Meal Item Block subcomponent of the App GUI has the following subcomponents.

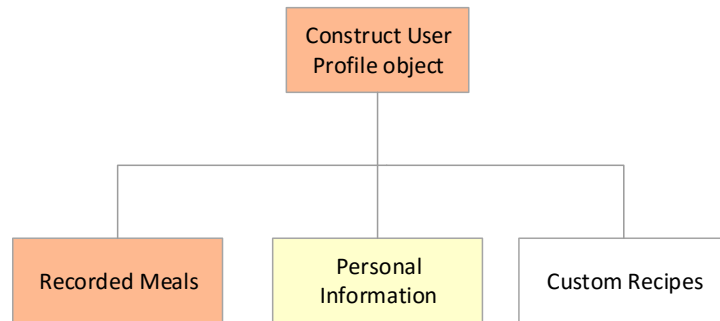


The Nutrient Block subcomponent of the App GUI has the following subcomponents.



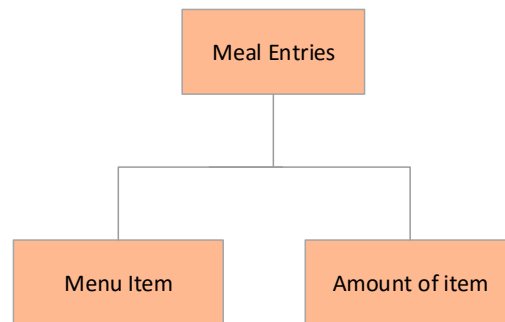
Level 6

The Construct User Profile subcomponent of the App Engine has the follow subcomponents.



Level 6

The Meal Entries subcomponent of the Phone Database has the following subcomponents.



The Menu Item subcomponent of the Phone Database has the following subcomponents.

