

Student Authentication and Profile Management	
Function	User Authentication, Registration, and Profile Management
Description	Handles secure student registration and login using an external identity provider compliant with OpenID Connect standards. Manages user sessions, supports password reset through the identity provider, and enables students to update their personal information such as name, ID, email, and profile picture.
Inputs	Student credentials (email, password, or federated login token); profile data fields (name, ID, photo).
Source	User input through registration/login form and identity provider response.
Outputs	Authentication token and active session; success or error messages; updated user profile data.
Destination	User dashboard and profile management interface.
Action	When a student logs in or registers, the system authenticates credentials using the provider, establishes a secure session, and loads the student dashboard. Profile edits are stored in the user database after validation.
Requirements	Stable internet connection; valid institutional account; secure backend database.
Pre-condition	Authentication service must be available; student account must exist or be newly created.
Post-condition	Session established or updated; modified profile saved to the database.
Side effects	Automatic logout occurs after session timeout for security.

Menu Display and Browsing	
Function	Display and manage the cafeteria menu with detailed information and filters.
Description	Displays daily categorized menus such as Breakfast, Lunch, Snacks, and Beverages. Each menu item includes its name, description, price, image, availability status, preparation time, nutritional facts, and allergen warnings. Students can search or filter items by category.
Inputs	Menu item data (name, description, price, category, image, availability, nutritional info, allergen info).
Source	Cafeteria menu database or content management system.
Outputs	Dynamic menu displayed on the user interface; search and filter results; real-time updates.
Destination	Frontend web interface - Menu Page.
Action	The system retrieves and displays menu items grouped by category. When the user searches or applies filters, the system updates visible items. Real-time availability is refreshed automatically when an item becomes unavailable.
Requirements	Active backend API; structured menu database; connection to the availability tracking module.
Pre-condition	System connected to the backend database; user on the menu page.
Post-condition	Filtered or updated menu displayed to the user.
Side effects	None.

Meal Pre-Ordering	
Function	Meal Pre-Ordering
Description	Enables students to select and pre-order meals from the available menu before arriving at the café. Students can choose desired items, select portion sizes (Small, Medium, Large), and specify optional special instructions. The feature streamlines the ordering process and reduces waiting times at pickup.
Inputs	Selected menu items, portion size, and optional special instructions.
Source	User selections from the menu browsing interface.
Outputs	Order preview showing selected items, size, price, and preparation time.
Destination	Cart system and order database.
Action	When the student selects an item and size, the system verifies availability, applies any size-based price modifiers, and adds the item to a temporary pre-order list. The order details are stored for confirmation before checkout.
Requirements	Real-time menu data; pricing and size mapping; order validation mechanism.
Pre-condition	User must be logged in and menu items must be available for the current day.
Post-condition	Pre-ordered items are temporarily saved in the user's session or cart.
Side effects	Unavailable items may be automatically removed if their availability changes before checkout.

Shopping Cart Management	
Function	Shopping Cart Item Modification and Management
Description	Allows students to view, update, and manage their cart before checkout. They can change quantities, remove items, or clear the entire cart. The cart automatically recalculates the total price (including tax) after every update, ensuring accurate order totals.
Inputs	Cart items, updated quantities, item deletions, and recalculated totals.
Source	User interactions on the cart interface.
Outputs	Updated cart summary reflecting changes in item count and total cost.
Destination	Checkout module and order summary page.
Action	Each modification (add, edit, delete) triggers an immediate update to the cart state and recalculates totals. Once finalized, the updated cart data is sent to the checkout module for further processing.
Requirements	Active user session; consistent pricing data; responsive cart interface.
Pre-condition	User logged in with existing cart data; menu items available.
Post-condition	Cart state updated and stored until checkout or manual clearance.
Side effects	If an item becomes unavailable, the system automatically removes it and updates the total.

Order Checkout & Customization	
Function	Order checkout with pickup scheduling, automatic tax calculation, and customization options.
Description	Facilitates the final checkout process by allowing students to choose a preferred pickup time slot with at least 15 minutes' advance notice. The system automatically calculates the total order cost, including applicable taxes, and provides a field for any special instructions related to the order (e.g., "extra sauce," "no onions").
Inputs	Cart items, selected pickup time, quantity, size, and optional special instructions.
Source	User input from the cart and checkout interface.
Outputs	Finalized order summary showing item details, total cost with tax, and scheduled pickup time confirmation.
Destination	Order confirmation module and kitchen order queue.
Action	Once the user proceeds to checkout, the system validates cart items, ensures the selected pickup slot is available, computes the total price (base price + tax), and attaches any special notes to the order. After confirmation, the order details are recorded and sent to the kitchen for preparation.
Requirements	Accurate tax configuration in the backend; order timing module to manage pickup slots; active database for storing order data.
Pre-condition	Student must be logged in with a valid cart and selected items. The chosen pickup time must be at least 15 minutes from the current time.
Post-condition	Order is saved in the database with complete details including total cost, selected pickup slot, and special instructions.
Side effects	If multiple users choose the same time slot, the system may adjust availability dynamically or suggest an alternate slot.