

SWE573 Course Project Report

Name: Esmatullah Adel

Student ID: 2023719138

Course: Swe573 Software Development Practice, Fall 2024

Date: 20-12-2024

Project Name: Mystery Object Identification

Project Deployment URL: <https://esmatullah.zirakashna.com/>

Git Repository URL: <https://github.com/esmatullah-adel/swe573>

Git Tag Version URL: <https://github.com/esmatullah-adel/swe573/releases/tag/v0.9>

Username: muzhda

Password: ABC@1234

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Project Declaration:

HONOR CODE

Related to the submission of all the project deliverables for the Swe573 Fall 2024

semester project reported in this report, I Esmatullah Adel declare that:

- I am a student in the Software Engineering MS program at Bogazici University and am registered for Swe573 course during the Fall 2024 semester.
- All the material that I am submitting related to my project (including but not limited to the project repository, the final project report, and supplementary documents) have been exclusively prepared by myself.
- I have prepared this material individually without the assistance of anyone else with the exception of permitted peer assistance which I have explicitly disclosed in this report.

Third-Party Software Declaration

This project utilizes the following third-party software in accordance with their respective licenses:

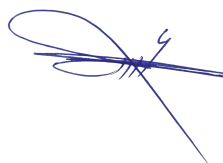
1. Google Maps API

- Used for geolocation and setting object locations within the application.
- License: Refer to [Google Maps Platform Terms of Service](#).

2. Wikidata API

- Used for tagging mysterious objects with relevant metadata.
- License: Refer to [Wikidata Terms of Use](#).

Esmatullah Adel



Project Details:

Project Overview:

The "Identifying Mysterious Objects" project is developed as part of the SWE573 course. It is a web-based platform that allows users to post and explore mysterious objects with detailed attributes. The system aims to facilitate user interaction through posts, comments, and advanced search capabilities. By integrating third-party tools such as Google Maps API for geolocation and Wikidata API for metadata tagging, the platform provides a rich and engaging user experience. This project showcases a robust implementation of modern web technologies and promotes collaboration and discovery among its users.

Software Requirements Specification (SRS):

1. Introduction

The purpose of this part of the document is to outline the software requirements for the "Identifying Mysterious Objects" system, developed as part of the SWE573 course project. The system is designed to allow users to register, post mysterious objects, comment on existing posts, perform advanced searches, and view user profiles.

1.1 Purpose

This system will enable individuals to post and discover mysterious objects. It will facilitate collaboration and discussion among users through a comprehensive set of features, including advanced search, tagging with Wikidata, and geolocation capabilities.

1.2 Scope

The system will:

- Allow anyone to register and create an account.
- Provide functionality for registered users to post mysterious objects with detailed attributes.
- Enable registered users to write comments on existing posts.
- Support filtering and advanced search for posts.

- Include user profiles displaying the user's posts and comments.

2. Functional Requirements

2.1 User Registration

- **FR-1:** The system shall allow users to register with a username, email address, and password.
- **FR-2:** The system shall send a verification email to the registered email address for account activation.

2.2 Posting Mystery Objects

- **FR-3:** The system shall allow registered users to create posts for mystery objects.
- **FR-4:** Each post shall include the following attributes:
 - Object name
 - Description
 - Image (upload functionality)
 - Tags (selected from Wikidata)
 - Dimensions (width, height, length)
 - Weight
 - Price
 - Taste
 - Smell
 - Location (using Google Maps API integration)
 - Condition (e.g., new, used)
 - Age
 - Functionality
 - Hardness
 - Shape
 - Color

- Material
- **FR-5:** Users shall be able to add multiple tags from Wikidata to a post.
- **FR-6:** The system shall validate all required fields before allowing a post to be created.

2.3 Commenting on Mystery Objects

- **FR-7:** The system shall allow registered users to write comments on existing mystery object posts.
- **FR-8:** Each comment shall include the comment text and the timestamp of the comment.
- **FR-9:** Users shall be able to view all comments associated with a mystery object.

2.4 Advanced Search and Filtering

- **FR-10:** The system shall allow users (both registered and unregistered) to perform searches based on one or more of the following filters:
 - Object name
 - Tags
 - Location
 - Dimensions
 - Price range
 - Condition
 - Material
 - Color
- **FR-11:** The system shall allow users to combine multiple filters for advanced search.

2.5 User Profiles

- **FR-12:** The system shall provide a user profile page for each registered user.
- **FR-13:** The profile page shall display all posts created by the user.
- **FR-14:** The profile page shall display all comments written by the user.

- **FR-15:** Users shall be able to edit their profile information, including username, email, and profile picture.

3. Non-Functional Requirements

3.1 Usability

- **NFR-1:** The system shall provide a user-friendly interface for navigating, posting, and searching.
- **NFR-2:** The system shall be accessible via both desktop and mobile browsers.

3.2 Performance

- **NFR-3:** The system shall handle up to 1,000 concurrent users without performance degradation.
- **NFR-4:** Search functionality shall return results within 2 seconds for 95% of queries.

3.3 Security

- **NFR-5:** All user passwords shall be hashed using a secure algorithm before storage.
- **NFR-6:** The system shall implement HTTPS to ensure secure data transmission.
- **NFR-7:** The system shall validate all user inputs to prevent SQL injection and cross-site scripting (XSS) attacks.

3.4 Scalability

- **NFR-8:** The system architecture shall support future enhancements, such as additional post attributes and advanced user analytics.
- **NFR-9:** The system shall be designed to scale horizontally to handle increased user traffic.

3.5 Integration

- **NFR-10:** The system shall integrate with Wikidata for tagging functionality.
- **NFR-11:** The system shall integrate with Google Maps API for geolocation features.

4. System Architecture

4.1 High-Level Architecture

- The system will be built using Django for the backend, PostgreSQL for database management, and Docker for containerization.
- The frontend will use modern web technologies (e.g., HTML5, CSS3, Bootstrap, JavaScript) to ensure responsiveness and usability.

4.2 External Dependencies

- Google Maps API for location services.
- Wikidata API for tagging functionality.

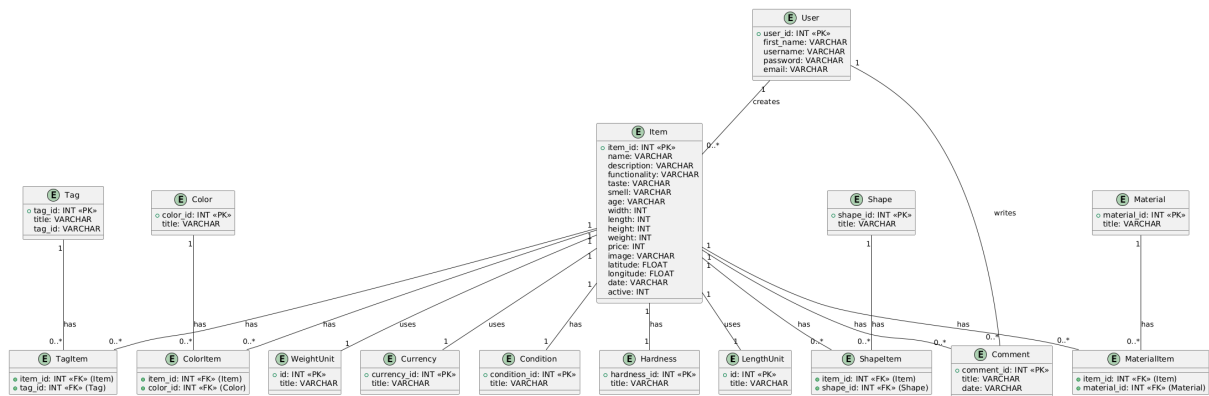
5. Assumptions and Constraints

- The system assumes that users have access to an internet connection.
- The system will be hosted on a cloud platform, ensuring availability and scalability.
- Third-party APIs (Google Maps and Wikidata) are assumed to be operational and accessible.

This document serves as the baseline for the development and implementation of the "Identifying Mysterious Objects" system. Any modifications or enhancements to these requirements will be addressed in future iterations.

Design Documents:

Entity Relationship Diagram (ERD):



Status of Project:

No	Requirement	Status
1	Posting new mystery object	Completed
2	Writing comments	Completed
3	User profile	Completed
4	User Management (Registering New User, Login, Logout)	Completed
5	Advanced Search	Completed
6	Custom Settings (Inserting New Shapes, Length Unit, Weight Unit, Currencies, Materials, Conditions, Hardness, Colors)	Completed
7	Responsive User Interface	Completed
8	Using Google Maps for getting location	Completed

Status of Deployment:

The project is dockerized and deployed.

<https://esmatullah.zirakashna.com/>

Full installation instructions including docker:

Prerequisites

- Python 3.x
- PostgreSQL
- Pip (Python package installer)
- Virtual Environment (optional but recommended)
- Docker Desktop

Steps

1. Clone the repository:

```
git clone https://github.com/esmatullah-adel/swe573.git
cd swe573
```

2. Create a virtual environment:

```
python -m venv venv
source venv/bin/activate # On Windows: venv\Scripts\activate
```

3. Install the dependencies if prefer to not use docker:

```
pip install -r requirements.txt
```

4. Set up environment variables:

Create a `.env` file in the root directory and configure the following:

```
DATABASE_URL=postgres://<username>:<password>@<host>:<port>/<database>
SECRET_KEY=<your-django-secret-key>
```

```
DEBUG=True  
GOOGLE_MAPS_API_KEY=<your_own_google_map_api_key>
```

5. Run database migrations:

```
python manage.py migrate
```

6. Start the development server if prefer to not use docker:

```
python manage.py runserver
```

7. If prefer to use docker, first install docker desktop from <https://www.docker.com/products/docker-desktop/>. After installation, run docker desktop and then run the following commands:

```
docker-compose build  
docker-compose up -d
```

User manual - A description of how to use the system:

Overview

Welcome to the user manual for the **Mystery Object Identification System**, a web-based application developed using **Django** and **PostgreSQL**. This project is designed to enable users to post and identify mysterious objects, fostering collaboration and knowledge-sharing among a curious and investigative community.

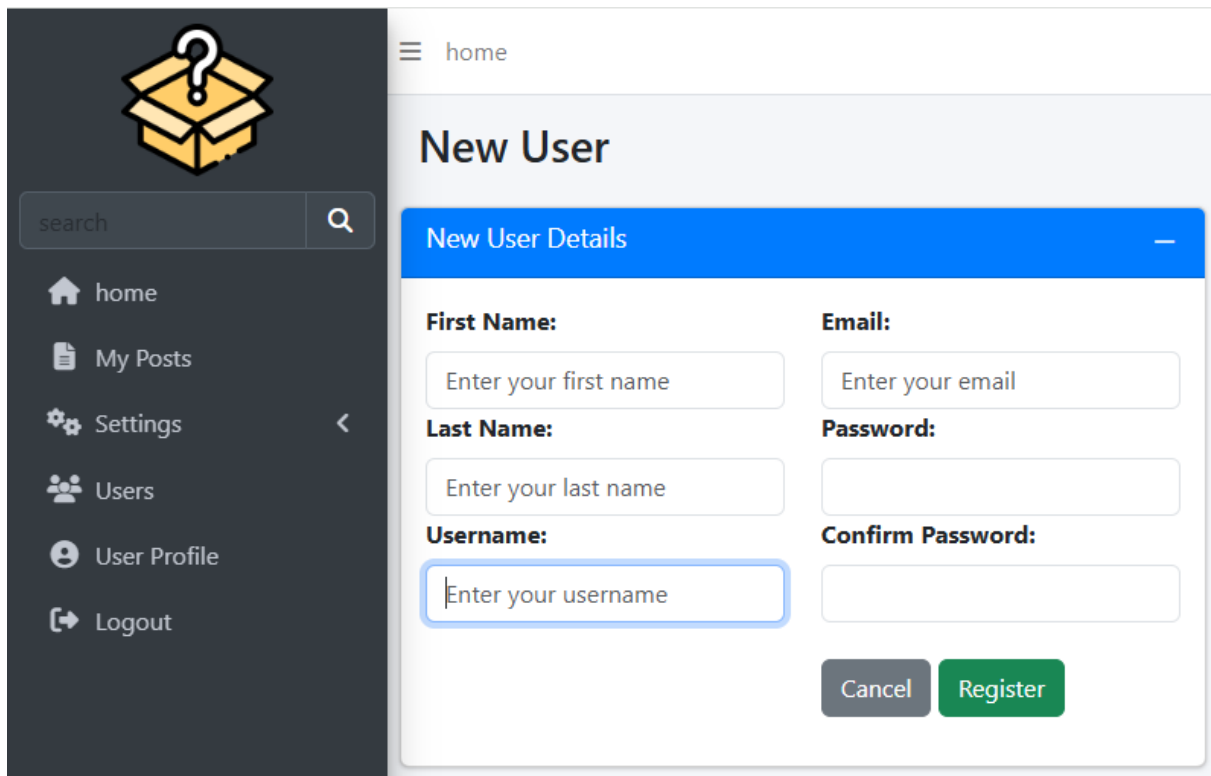
The application provides robust features for creating, managing, and interacting with posts about mystery objects, coupled with advanced search and filtering options for seamless user experience. It supports essential functionalities like user management, commenting, location tagging using Google Maps, and detailed metadata for each object. The interface is intuitive and responsive, ensuring accessibility across devices.

Key Features

1. User Management

- Secure registration, login, and logout functionality.
- User profiles displaying posts and comments history.

Registering new user:

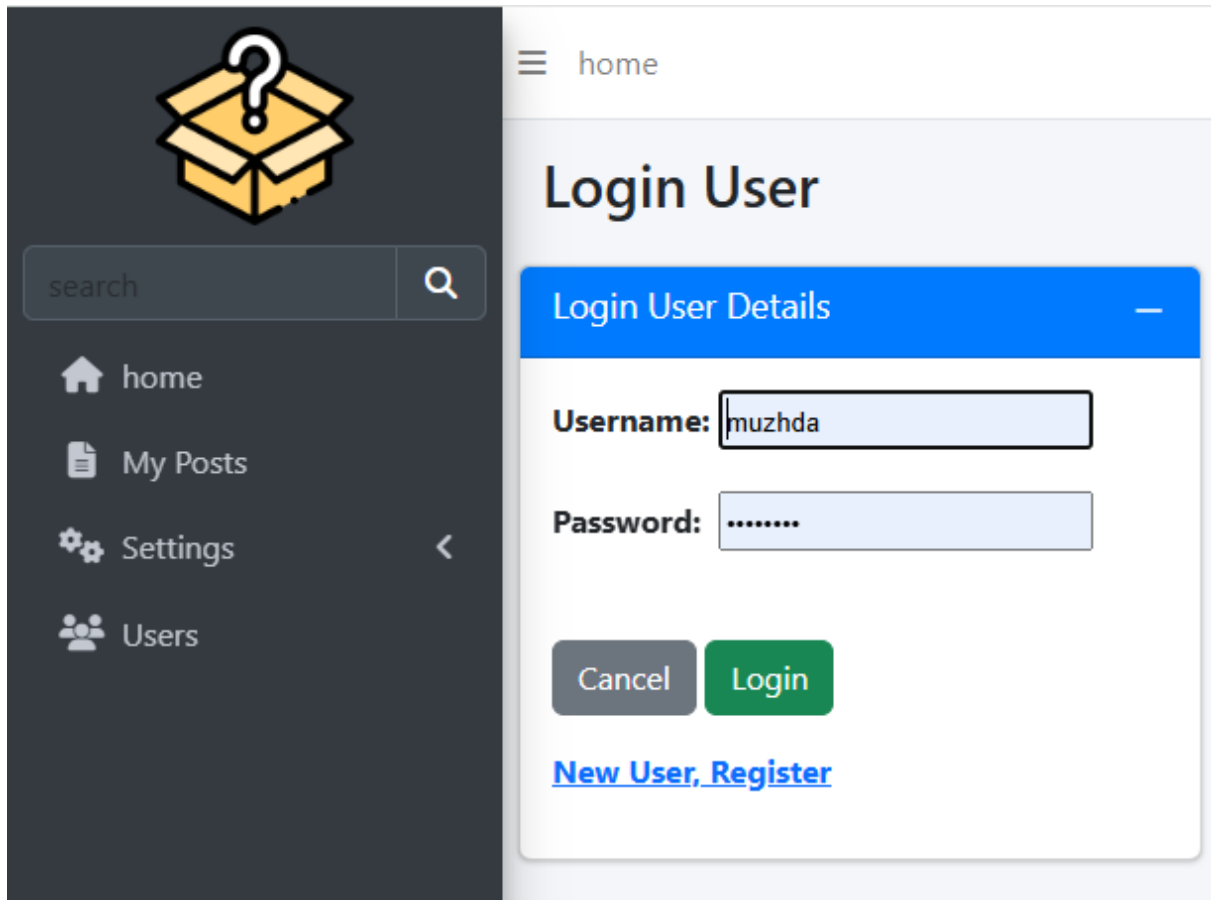


The screenshot displays a web application interface for user registration. On the left is a dark sidebar with a logo (a yellow box with a question mark) and a search bar. Below the search bar are navigation links: home, My Posts, Settings, Users, User Profile, and Logout. The main content area has a light gray header with a hamburger menu icon and the text 'home'. Below this is a section titled 'New User'. Inside this section is a modal-like form titled 'New User Details'. The form contains the following fields and labels:

- First Name:** A text input field with the placeholder 'Enter your first name'.
- Last Name:** A text input field with the placeholder 'Enter your last name'.
- Username:** A text input field with the placeholder 'Enter your username', which is currently highlighted with a blue border.
- Email:** A text input field with the placeholder 'Enter your email'.
- Password:** A text input field.
- Confirm Password:** A text input field.

At the bottom right of the form are two buttons: a gray 'Cancel' button and a green 'Register' button.

Login page:



The screenshot shows the 'Login User' page. On the left is a dark sidebar with a logo of a yellow box with a question mark, a search bar, and navigation links: 'home', 'My Posts', 'Settings', and 'Users'. The main content area has a 'home' link at the top. Below it is the 'Login User' title. A blue header for the 'Login User Details' form is followed by input fields for 'Username' (containing 'muzhda') and 'Password' (masked with dots). There are 'Cancel' and 'Login' buttons, and a link for 'New User, Register'.

home

Login User

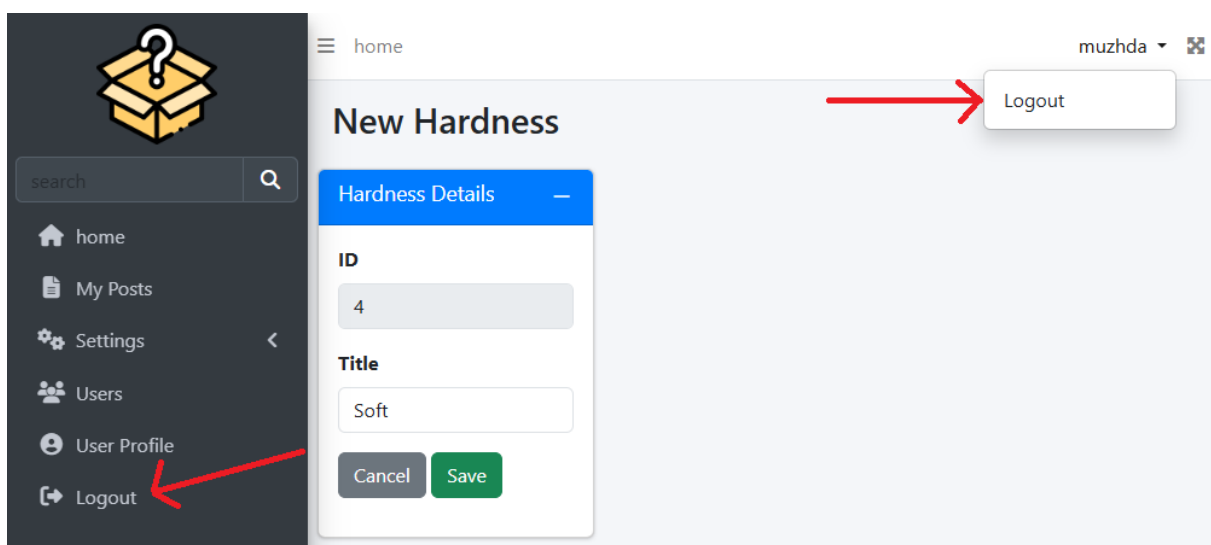
Login User Details

Username:

Password:

[New User, Register](#)

Logout:



The screenshot shows the 'New Hardness' page. The sidebar is identical to the previous one, but it includes 'User Profile' and 'Logout' links. A red arrow points to the 'Logout' link in the sidebar. The main content area shows the 'New Hardness' title and a 'Hardness Details' form with fields for 'ID' (4) and 'Title' (Soft), with 'Cancel' and 'Save' buttons. In the top right corner, the user 'muzhda' is logged in, and a dropdown menu shows a 'Logout' option, which is also highlighted by a red arrow.

home

New Hardness

Hardness Details

ID:

Title:

muzhda ▾

Logout

User profile:

search

home

My Posts

Settings

Users

User Profile

Logout

home

muzhda

User Profile

Muzhda

muzhda@gmail.com

Total Posts: 8

Total Comments: 2

Muzhda Recent Posts

A round mysterious object found on beach

Posted on: 2024-12-17 16:37:31

Found on moon

I found it on moon guys. Does anyone know something about it?

Posted on: 2024-12-17 16:39:24

Strange antique object

I found this in antique shop near to my house.

Muzhda Recent Comments

What a huge, metal, and round mystery object. It must be too old.

Commented on: [What a Huge Mystery](#) 2024-12-17 17:34:06

It look yellow and gray.

Commented on: [What a Huge Mystery](#) 2024-12-17 17:35:54

List of already registered users:

search

home

My Posts

Settings

Users

User Profile

Logout

home

muzhda

Users

+ Register New User

Copy CSV Excel PDF Print Column visibility

Search:

#	FirstName	Username	Email
6	Muzhda	muzhda	muzhda@gmail.com
5	Sahar	sahar	sahar@gmail.com
4	Khaled	khaled	khaled@gmail.com
3	Shafiq	shafiq	shafiq@gmail.com
2	Neda	neda	neda@gmail.com
1	Shams	shams	shams@gmail.com

Showing 1 to 6 of 6 entries

Previous 1 Next

2. Posting Mystery Objects

- Users can create detailed posts with attributes such as object name, description, tags (integrated with Wikidata), images, dimensions, weight, price, and more.
- Integration with Google Maps allows users to set object locations.

Creating new post:

The 'New Post' form for a 'Mystery Object' is displayed. It includes a sidebar with navigation links: home, My Posts, Settings, Users, User Profile, and Logout. The form fields are organized into columns:

- ID:** 11
- Name:** Mystery object name.
- Description:** Describe your mystery object...
- Tag:** Search for a tag...
- Size:** width, length, height, C...
- Taste:** taste of the object
- Smell:** smell of the object
- Functionality:** functionality of the object
- Age:** age for the object in years
- Weight:** weight, G
- Price:** 0, TL
- Condition:** New
- Hardness:** Rigid
- Material:**
- Color:**
- Shape:**
- Location:** Map, Satellite, GÜLBAG, Trump Alışveriş Merkezi, Aste
- Image:** Choose File, No file chosen
- Buttons:** Cancel, Post

List of the logged in user posts:

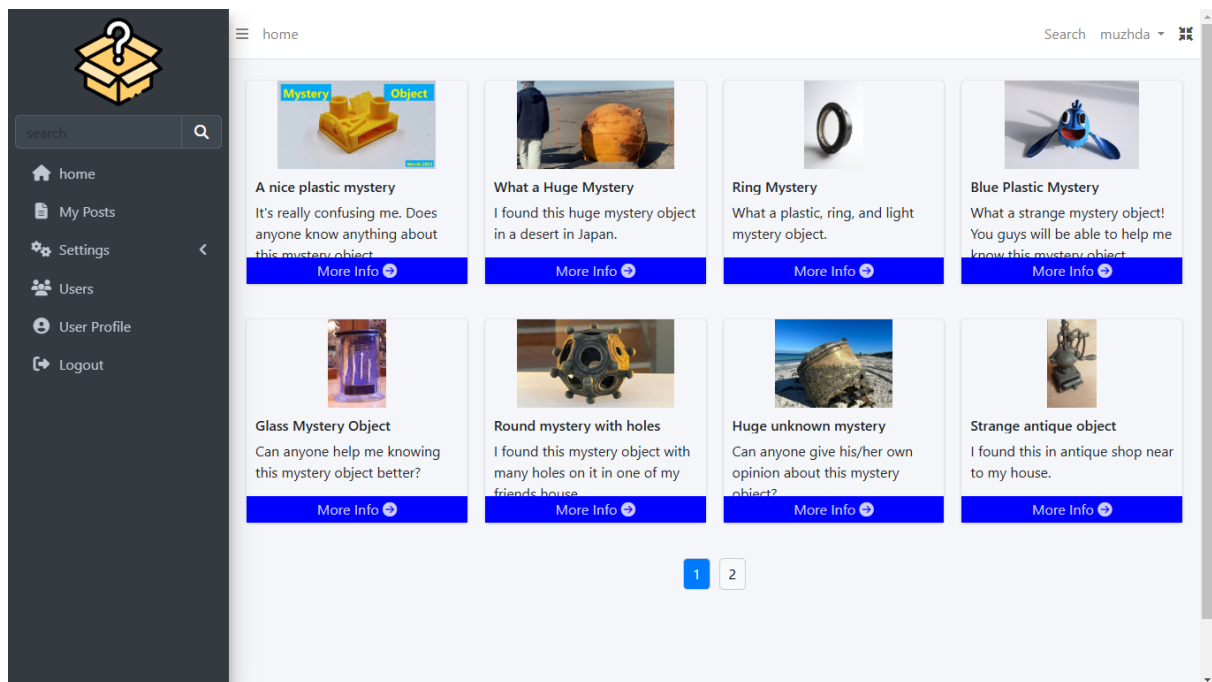
The 'Posts' list for a logged-in user is displayed. It includes a sidebar with navigation links: home, My Posts, Settings, Users, User Profile, and Logout. The list shows 8 entries, each with a number, name, description, dimensions, and actions.

#	Name	Descriptions	Dimensions	Actions
8	Ring Mystery	What a plastic, ring, and light mystery object.	10 x 30 x 30 CM	
7	Blue Plastic Mystery	What a strange mystery object! You guys will be able to help me know this mystery object.	10 x 40 x 20 CM	
6	Glass Mystery Object	Can anyone help me knowing this mystery object better?	30 x 30 x 50 CM	
5	Round mystery with holes	I found this mystery object with many holes on it in one of my friends house.	40 x 40 x 40 CM	
4	Huge unknown mystery	Can anyone give his/her own opinion about this mystery object?	2 x 2 x 3 Meter	
3	Strange antique object	I found this in antique shop near to my house.	30 x 40 x 80 CM	
2	Found on moon	I found it on moon guys. Does anyone know something about it?	20 x 30 x 40 CM	
1	A round mysterious object	found on beach	20 x 20 x 20 CM	

Showing 1 to 8 of 8 entries

Previous 1 Next

List of all posts/home page/dashboard:



3. Commenting System


- Users can interact by writing and viewing comments on mystery objects.
- Timestamped comments ensure clear communication.

Writing comments:


Mystery Object

Glass Mystery Object

Can anyone help me knowing this mystery object better?



Dimensions:
Length: 30 CM
Width: 30 CM
Height: 50 CM
Weight: 200 G
Price: 600 TL
Taste: no taste
Smell: no smell
Functionality: Keeping Materials
Materials: Glass
Colors: Green
Shapes: Round
Tags: [glass](#)

Age: 80
Condition: New
Hardness: Rigid
Location:

Comments

[Khaled](#) 2024-12-17 17:18:09

It looks really interesting to keep it in a room.

Comment

Comment

Cancel

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4. Advanced Search and Filtering

- Search objects based on multiple criteria such as tags, location, price range, material, and many more.
- Combine filters for precise results.

Advanced search:

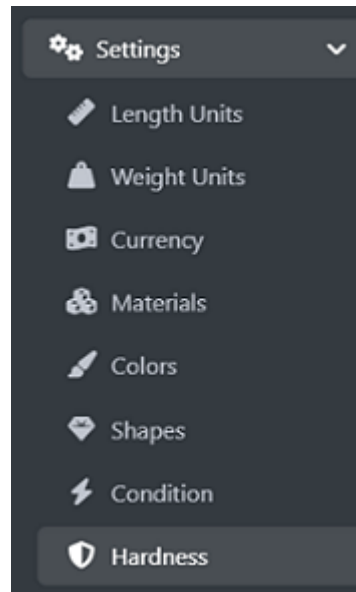
The image shows a screenshot of a web application with a modal window titled "Search Mystery Object". The modal is overlaid on a background showing a list of mystery objects. The modal form is organized into a grid of input fields for various search criteria. The criteria include ID, Name, Description, Tag, Size (width, height, length), Weight, Price, Taste, Smell, Functionality, Age, Hardness, Material, Color, Shape, Date, Latitude, and Longitude. Each criterion has a corresponding input field or dropdown menu. At the bottom of the modal, there are "Close" and "Search" buttons.

ID	Taste	Resolved/Unresolved
<input type="text" value="Mystery objec"/>	<input type="text" value="tate of the objec"/>	<input type="text" value="Both"/>
Name	Smell	Condition
<input type="text" value="Mystery object r"/>	<input type="text" value="smell of the obje"/>	<input type="text" value="No One"/>
Description	Functionality	Hardness
<input type="text" value="Describe your mystery object..."/>	<input type="text" value="functionality of t"/>	<input type="text" value="No One"/>
Tag	Age	Material
<input type="text" value="Search for a tag."/>	<input type="text" value="age for the obje"/>	<input type="text"/>
Size	Age	Color
<input type="text" value="wic"/> <input type="text" value="len"/> <input type="text" value="hei"/>	<input type="text" value="min ye"/> <input type="text" value="max ye"/>	<input type="text"/>
Width	Weight	Shape
<input type="text" value="min"/> <input type="text" value="max"/>	<input type="text" value="weig"/> <input type="text" value="G"/>	<input type="text"/>
Height	Weight	Date
<input type="text" value="min"/> <input type="text" value="max"/>	<input type="text" value="min"/> <input type="text" value="max"/>	<input type="text"/>
Length	Price	Latitude
<input type="text" value="n"/> <input type="text" value="m"/> <input type="text" value="CM"/>	<input type="text" value="pric"/> <input type="text" value="TL"/>	<input type="text" value="latitude here"/>
	Price	Longitude
	<input type="text" value="min"/> <input type="text" value="max"/>	<input type="text" value="longitude here"/>

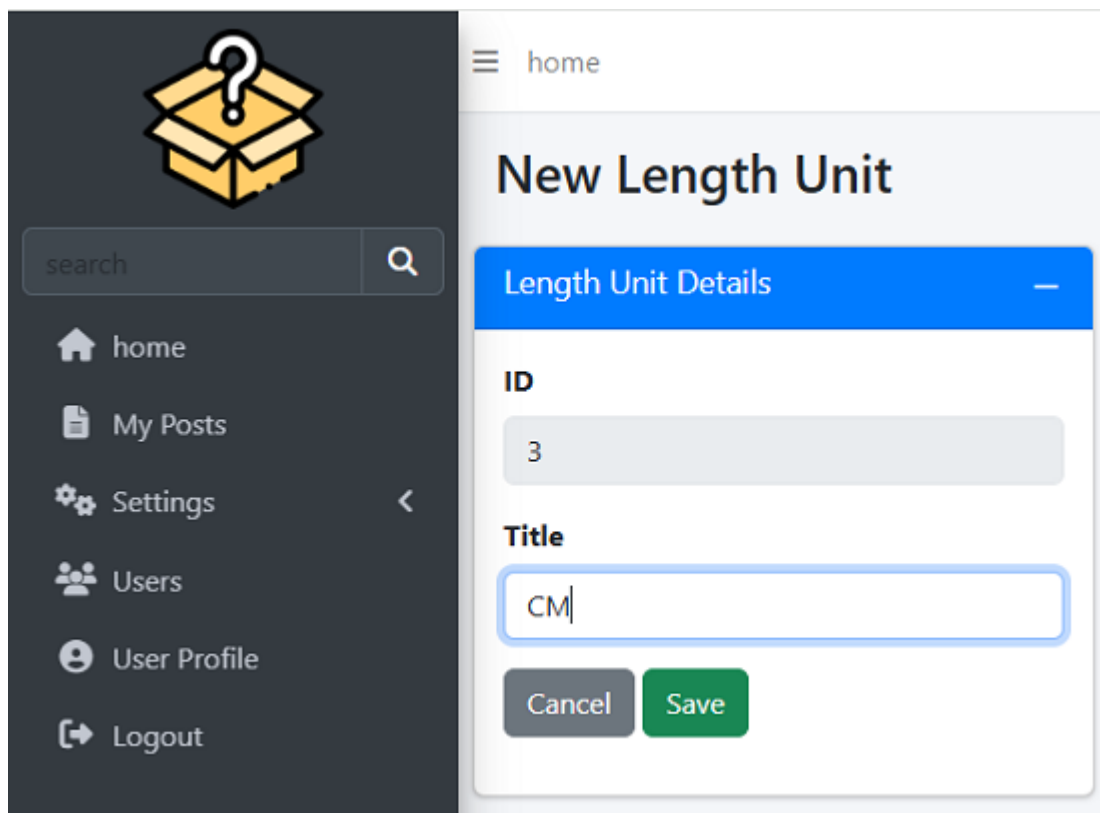
Close Search

5. Custom Settings

- Personalized colors, currencies, shapes, materials, length units, weight units, condition, and hardness.



Custom Settings for Length Units:



The image shows a web application interface. On the left is a dark sidebar menu with a search bar and icons for home, My Posts, Settings (highlighted), Users, User Profile, and Logout. On the right is the main content area, which displays a 'New Length Unit' form. The form has a blue header 'Length Unit Details' and two input fields: 'ID' with the value '3' and 'Title' with the value 'CM'. At the bottom of the form are 'Cancel' and 'Save' buttons.

Custom Settings for Weight Units:

The screenshot shows a web application interface. On the left is a dark sidebar with a logo of a yellow box with a question mark, a search bar, and a list of menu items: home, My Posts, Settings (with a left arrow), Users, User Profile, and Logout. The main content area has a light gray header with a hamburger menu icon and the text 'home'. Below the header is a title 'New Weight'. Underneath is a blue header for 'Weight Unit Details' with a minus sign. The form contains two fields: 'ID' with the value '3' and 'Title' with the value 'KG'. At the bottom are two buttons: 'Cancel' (gray) and 'Save' (green).

home

New Weight

Weight Unit Details

ID

3

Title

KG

Cancel Save

Custom Settings for Currency:

The screenshot shows the same web application interface as above, but for currency settings. The main content area has a title 'New Currency'. The blue header for 'Currency Details' is present. The form contains two fields: 'ID' with the value '5' and 'Title' with the value 'TL'. At the bottom are two buttons: 'Cancel' (gray) and 'Save' (green).

home

New Currency

Currency Details

ID

5

Title

TL

Cancel Save

Custom Settings for Materials:

The screenshot shows a web application interface. On the left is a dark sidebar with a logo of a yellow box with a question mark. Below the logo is a search bar and a list of menu items: home, My Posts, Settings, Users, User Profile, and Logout. The main content area is titled 'New Material' and contains a form titled 'Material Details'. The form has two input fields: 'ID' with the value '4' and 'Title' with the value 'Plastic'. At the bottom of the form are two buttons: 'Cancel' and 'Save'.

home

New Material

Material Details

ID

4

Title

Plastic

Cancel Save

Custom Settings for Colors:

The screenshot shows the same web application interface as above, but the main content area is titled 'New Color' and contains a form titled 'Color Details'. The form has two input fields: 'ID' with the value '7' and 'Title' with the value 'Purple'. At the bottom of the form are two buttons: 'Cancel' and 'Save'.

home

New Color

Color Details

ID

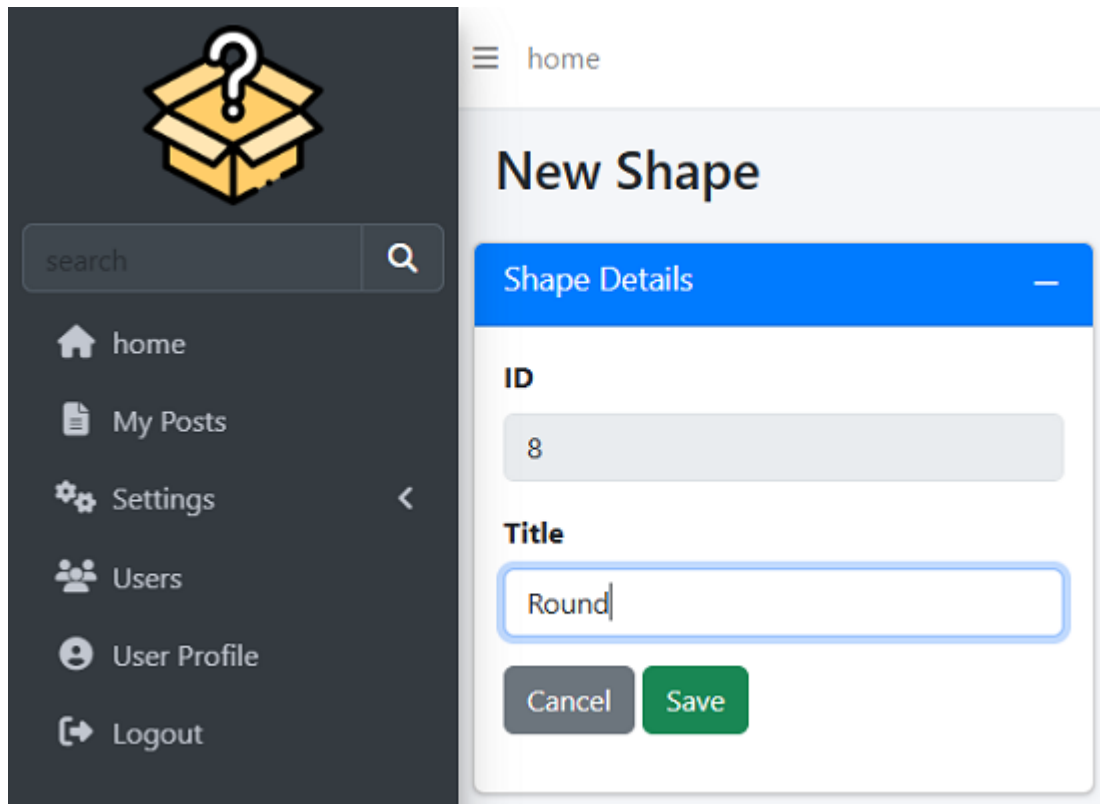
7

Title

Purple

Cancel Save

Custom Settings for Shapes:



home

New Shape

Shape Details

ID

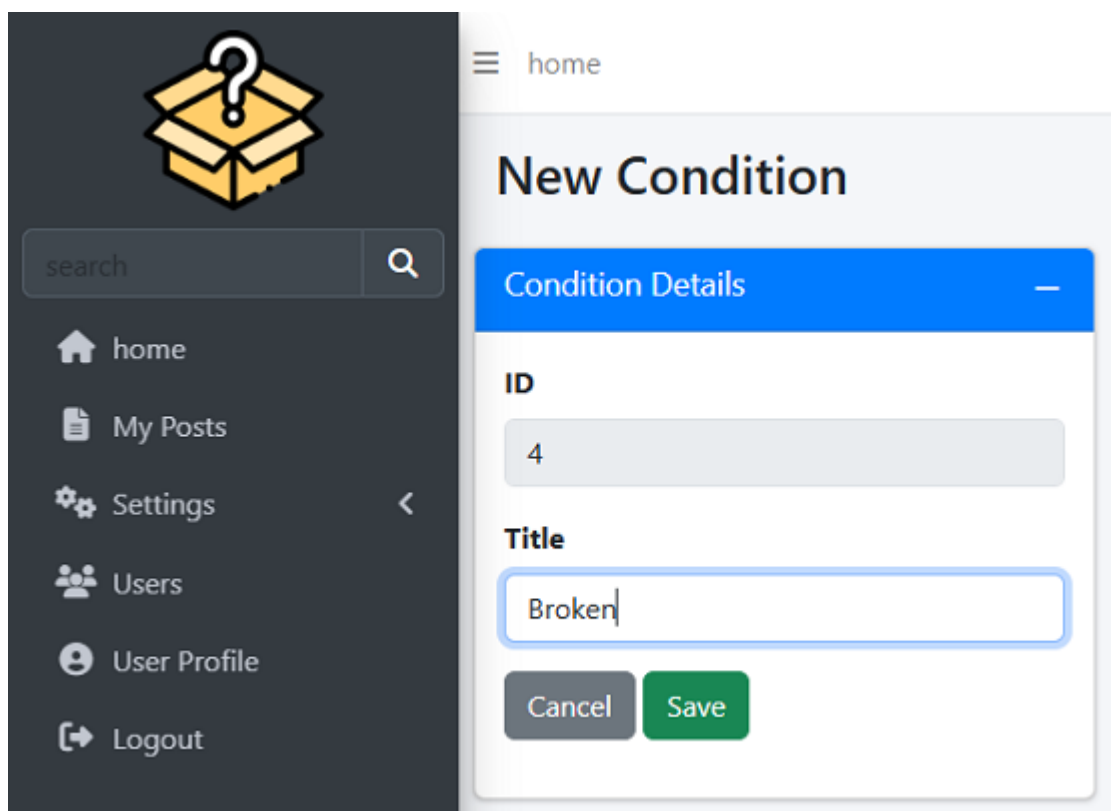
8

Title

Round

Cancel Save

Custom Settings for Condition:



home

New Condition

Condition Details

ID

4

Title

Broken

Cancel Save

Custom Settings for Hardness:

The screenshot displays a web application interface. On the left is a dark sidebar with a logo of a yellow box with a question mark. Below the logo is a search bar and a list of navigation items: 'home', 'My Posts', 'Settings', 'Users', 'User Profile', and 'Logout'. The 'Settings' item is highlighted with a left-pointing arrow. The main content area has a light gray header with a hamburger menu icon and the text 'home'. Below this is a title 'New Hardness'. A blue header bar for the form is labeled 'Hardness Details'. The form contains two input fields: 'ID' with the value '4' and 'Title' with the value 'Soft'. At the bottom of the form are two buttons: 'Cancel' and 'Save'.

home

New Hardness

Hardness Details

ID

4

Title

Soft

Cancel Save

Test Results (Unit & User)

1. Introduction

This section outlines the testing process and results for the **Mystery Object Identification Course Project**. Testing was conducted to ensure the application's functionality, usability, and performance met the defined requirements. Two types of testing were performed:

- **Unit Testing:** Focused on verifying the functionality of individual components.
- **User Testing:** Evaluated the overall user experience and satisfaction during interaction with the application.

2. Unit Testing

2.1 Objectives

- Validate that each module and function operates as expected.
- Ensure integration of components works without errors.

2.2 Methodology

- Automated tests were written for critical components using Django's built-in testing framework.
- Test cases were defined based on functional requirements, covering edge cases and common scenarios.

2.3 Test Coverage

Component	Test Case Description	Status
Items View	Display items specific to the logged-in user and verify item details visibility.	Passed
New Item View	Test creating a new item, including validation of required fields and image upload.	Passed
Show Item View	Verify that item details are displayed correctly for a single item.	Passed
Delete Item View	Ensure items can be deleted, and confirm the redirection and database update.	Passed

Component	Test Case Description	Status
Resolve and Unresolve Item View	Toggle an item's active state and confirm the status is updated in the database.	Passed
Dashboard View	Test GET and POST requests for fetching and filtering item data on the dashboard.	Passed
Logout View	Ensure user logout functionality clears session and redirects to the home page.	Passed
LengthUnit Model	Validate the creation and retrieval of LengthUnit objects.	Passed
Item Model	Ensure all fields and relationships (e.g., user, dimensions, condition) are correct.	Passed
Condition Model	Test the creation and retrieval of Condition objects.	Passed
Comment Model	Verify comment creation, including associations with items and users.	Passed

2.4 Results

- **Total Test Cases:** 11
- **Passed:** 11
- **Failed:** 0

All unit tests, including those for views and models, passed successfully, confirming the functionality and reliability of individual components.

3. User Testing

3.1 Objectives

- Assess the usability and user satisfaction of the application.
- Identify potential usability issues or enhancements.

3.2 Methodology

- The project was presented to classmates and the professor during a class session.
- A live demonstration covered core features, including user registration, posting mystery objects, commenting, and advanced search.

- Feedback was collected in two ways:
 1. **Verbal Feedback:** Participants shared real-time observations and suggestions.
 2. **Bug Retesting:** Previously reported issues, particularly with advanced search filters, were demonstrated as resolved.

3.3 Key Findings

Task	Completion Rate	Observations
User Registration	100%	Smooth and intuitive functionality
Posting a Mystery Object	100%	Users appreciated the image upload and metadata options
Writing a Comment	100%	No issues identified
Performing Advanced Search	100%	Resolved bugs led to successful multi-filter searches

3.4 User Feedback

- **Positive:** The professor and classmates commended the resolved advanced search bugs and found the application intuitive and functional. The Google Maps integration was particularly praised.
- **Suggestions:** Include more visual feedback (e.g., loading indicators) for complex operations like searching or posting items.