Sabirah Tarafdar: 33684097

Dynamic web applications Portfolio Project – HiveFocus

Outline

Hive Focus is an education-based productivity web application designed to help students stay focused, study effectively, and collaborate. The app features a Pomodoro-style timer that gamifies focus sessions, allowing users to earn points for completing study intervals. These points can be used to grow a virtual forest by purchasing virtual flowers and trees, providing a sense of progress and accomplishment.

For every hour studied, Hive Focus contributes toward a donation supporting ethical honey farming, promoting sustainability and environmental responsibility. The web app also includes a student discussion forum where users can ask questions, share knowledge, and interact with peers. With its mission to improve focus while fostering ecological impact, Hive Focus embodies its slogan, "Reap What You Sow."

Links

- **Deployed App**: http://www.doc.gold.ac.uk/usr/175/
- **GitHub Repository**: https://github.com/Abida-Tarafdar/my-forum

Architecture

High-Level Diagram:

Hive Focus employs a two-tier architecture:

1. **Application Tier**: Built with Node.js and Express for backend functionality, EJS for server-side rendering, and HTML, CSS, and JavaScript for the frontend.
2. **Data Tier**: MySQL database manages user data (first name, last name, email), published posts and replies.

Data Model Diagram:

Hive Focus uses a relational data model:

- **Users Table**: Stores user credentials, profile data, points earned, and forest progress.
- **Posts Table**: Handles discussion forum posts and metadata.
- **Replies Table**: Tracks replies to posts.

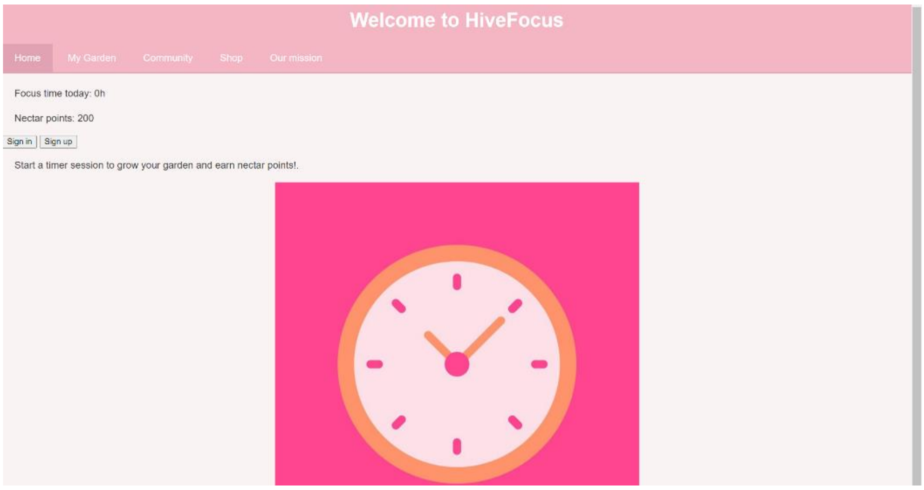
User Functionality

Hive Focus offers the following features to users:

1. Pomodoro Timer with Gamified Progress

- **Description**: A timer that helps users focus for intervals of 25 minutes with a 5-minute break. Completing intervals awards points, which contribute to both virtual rewards and real-world donations.
- **Screenshots**:

- Timer interface.



Welcome to HiveFocus

Focus time today: 0h

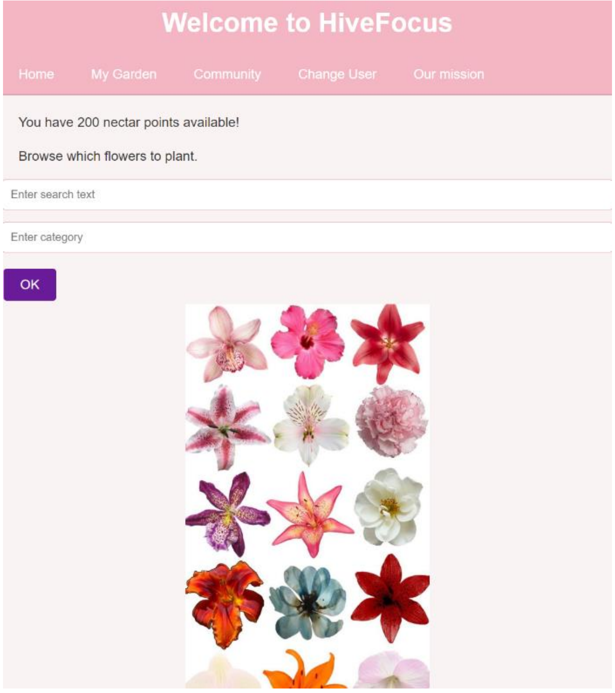
Nectar points: 200

Sign in | Sign up

Start a timer session to grow your garden and earn nectar points!.

2. Virtual Forest

- **Description**: Users can spend earned points to grow a personalized virtual forest by purchasing flowers and trees.
- **Features**:
  - **Shop Interface**: Buy virtual plants using earned points.
  - **Forest Visualization**: See the plants grow in an interactive interface.
  - **Leaderboard**: Compare forests with other users.
- **Screenshots**:
  - Shop interface for buying plants.
  -



Welcome to HiveFocus

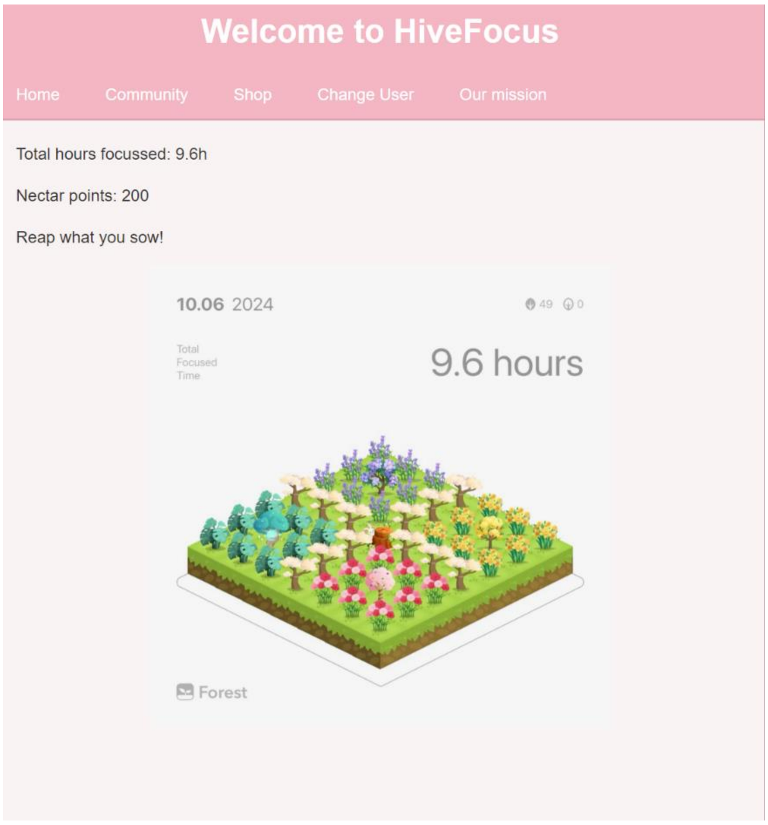
You have 200 nectar points available!

Browse which flowers to plant.

Enter search text

Enter category

- A user's virtual forest in progress.



Total hours focussed: 9.6h

Nectar points: 200

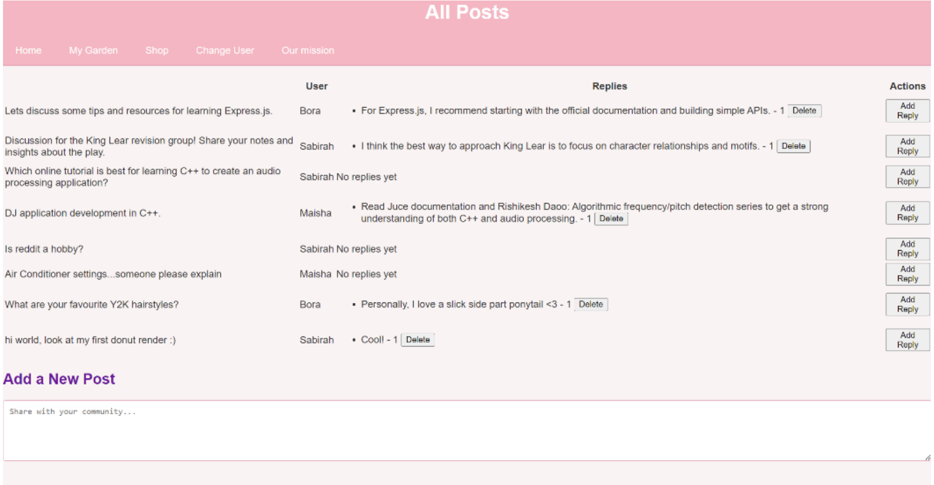
Reap what you sow!

-

3. Discussion Forum

- **Description**: A collaborative space for students to discuss academic topics and share knowledge.
- **Features**:
  - Post and reply functionality.
  - Edit and delete posts or replies.

Screenshots:



	User	Replies	Actions
Lets discuss some tips and resources for learning Express.js.	Bora	• For Express.js, I recommend starting with the official documentation and building simple APIs. - 1 Delete	Add Reply
Discussion for the King Lear revision group! Share your notes and insights about the play.	Sabirah	• I think the best way to approach King Lear is to focus on character relationships and motifs. - 1 Delete	Add Reply
Which online tutorial is best for learning C++ to create an audio processing application?	Sabirah	No replies yet	Add Reply
DJ application development in C++.	Maisha	• Read Juce documentation and Rishikesh Daoo: Algorithmic frequency/pitch detection series to get a strong understanding of both C++ and audio processing. - 1 Delete	Add Reply
Is reddit a hobby?	Sabirah	No replies yet	Add Reply
Air Conditioner settings...someone please explain	Maisha	No replies yet	Add Reply
What are your favourite Y2K hairstyles?	Bora	• Personally, I love a slick side part ponytail <3 - 1 Delete	Add Reply
hi world, look at my first donut render :)	Sabirah	• Cool! - 1 Delete	Add Reply

Add a New Post

Share with your community...

4. User Dashboard

- **Description**: Displays user progress, including total points and hours studied.

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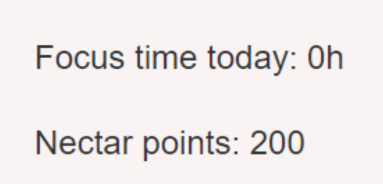
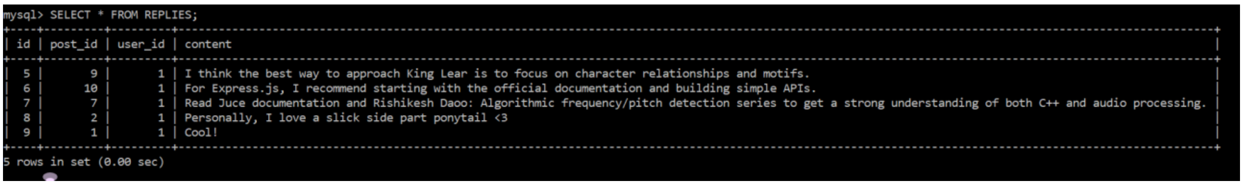
- **Screenshots**:
    - Dashboard summary with donation and forest statistics.



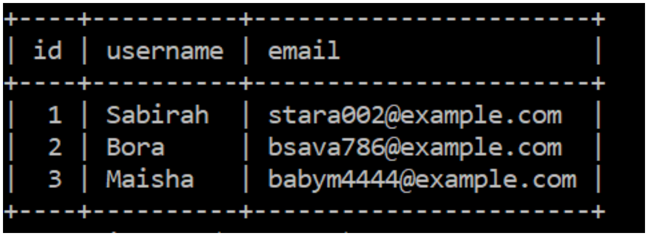
Focus time today: 0h

Nectar points: 200

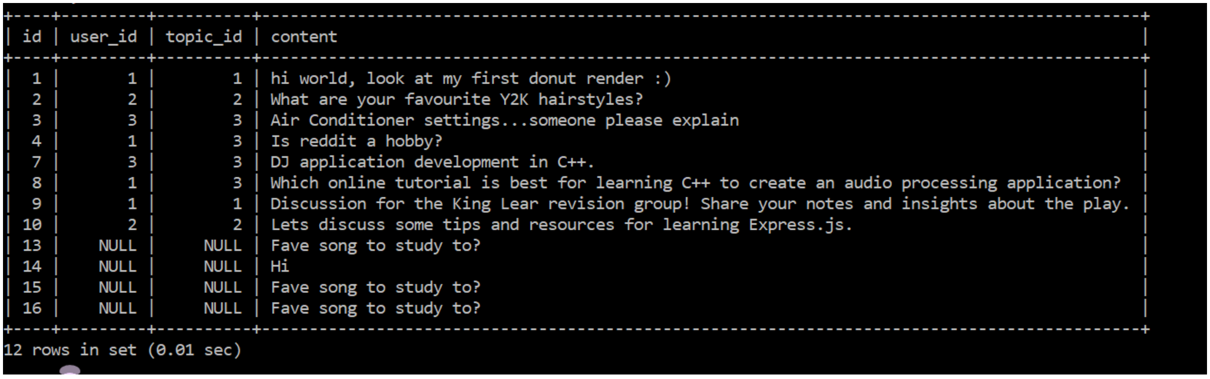
SQL tables;



```
mysql> SELECT * FROM REPLIES;
+----+---------+---------+------------------------------------------------------------------------------------------------------------------------------+
| id | post_id | user_id | content                                                                                                                      |
+----+---------+---------+------------------------------------------------------------------------------------------------------------------------------+
|  5 |       9 |       1 | I think the best way to approach King Lear is to focus on character relationships and motifs.                                |
|  6 |      10 |       1 | For Express.js, I recommend starting with the official documentation and building simple APIs.                               |
|  7 |       7 |       1 | Read Juce documentation and Rishikesh Daoo: Algorithmic frequency/pitch detection series to get a strong understanding of both C++ and audio processing. |
|  8 |       2 |       1 | Personally, I love a slick side part ponytail <3                                                                             |
|  9 |       1 |       1 | Cool!                                                                                                                        |
+----+---------+---------+------------------------------------------------------------------------------------------------------------------------------+
5 rows in set (0.00 sec)
```



```
+----+----------+-----------------------+
| id | username | email                 |
+----+----------+-----------------------+
|  1 | Sabirah  | stara002@example.com  |
|  2 | Bora     | bsava786@example.com  |
|  3 | Maisha   | babym4444@example.com |
+----+----------+-----------------------+
```



```
+----+---------+----------+-----------------------------------------------------------------------------------------+
| id | user_id | topic_id | content                                                                                 |
+----+---------+----------+-----------------------------------------------------------------------------------------+
|  1 |       1 |        1 | hi world, look at my first donut render :)                                              |
|  2 |       2 |        2 | What are your favourite Y2K hairstyles?                                                 |
|  3 |       3 |        3 | Air Conditioner settings...someone please explain                                       |
|  4 |       1 |        3 | Is reddit a hobby?                                                                      |
|  7 |       3 |        3 | DJ application development in C++.                                                      |
|  8 |       1 |        3 | Which online tutorial is best for learning C++ to create an audio processing application? |
|  9 |       1 |        1 | Discussion for the King Lear revision group! Share your notes and insights about the play. |
| 10 |       2 |        2 | Lets discuss some tips and resources for learning Express.js.                           |
| 13 |    NULL |     NULL | Fave song to study to?                                                                  |
| 14 |    NULL |     NULL | Hi                                                                                      |
| 15 |    NULL |     NULL | Fave song to study to?                                                                  |
| 16 |    NULL |     NULL | Fave song to study to?                                                                  |
+----+---------+----------+-----------------------------------------------------------------------------------------+
12 rows in set (0.01 sec)
```

The database structure establishes a set of clear relationships between tables through primary and foreign keys. The users table serves as a core reference, with its primary key (id) acting as a foreign key in other tables, such as posts, replies, and flashcards, to indicate ownership or authorship. The posts table connects to the users table via the user_id foreign key and to the topics table through the topic_id foreign key, linking each post to its creator and topic. Similarly, the replies table references posts via the post_id foreign key and users via the user_id foreign key, associating replies with their respective posts and authors. The topics table, while self-contained with a primary key (id), is linked to posts through the topic_id foreign key. The flashcards table ties its entries to users using the user_id foreign key, representing ownership. These relationships primarily exhibit one-to-many dynamics, such as one user having multiple posts, replies, or flashcards, and one topic encompassing multiple posts. Conversely, the many-to-one relationships indicate that each post, reply, or flashcard is linked back to a single user, ensuring referential integrity and enabling robust interaction across the tables.