BMS COLLEGE OF ENGINEERING

(Autonomous College under VTU)
Bull Temple Road, Basavanagudi, Bangalore – 560019

A project report on

"PenPals - Meet new people"

Submitted in partial fulfillment of the requirements for the award of degree

BACHELOR OF ENGINEERING

IN

INFORMATION SCIENCE AND ENGINEERING

By

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Under the guidance of

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<u>CERTIFICATE</u>

This is to certify that the project entitled "PenPals" is a bona-fide work carried out by **H Nidhi, 1BM19IS056** and **Meghana Rathanraj, 1BM19IS087** in partial fulfillment for the award of degree of Bachelor of Engineering in **Information Science and Engineering** from **BMS College of Engineering, Bangalore** during the year **2020-2021**. It is certified that all corrections/suggestions indicated for Internal Assessments have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering Degree.

Signature of the Faculty   **Signature of the HOD**
Name and Designation   **Name and Designation**

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<u>ACKNOWLEDGEMENTS</u>

ABSTRACT

With the recent Covid-19 pandemic outbreak, our lives went completely online for the first time ever! Everyone is locked up in their homes, following safety procedures. Millions of people haven't been in contact with their dear ones but at the same time, have been online 24/7. The fear of going offline and missing a text constantly on our minds. It is in response to this fear that we go back to the old practice of having penpals, to give our users a break. In a world filled with apps where you can message someone instantly, our website stands out as the place where replying instantly is frowned upon. The proposed web page "Penpal with me" is a multipurpose online platform which enables people to build a healthy community, meet new people based on a set of similar interests and at least one common language, in a dynamic manner.

INTRODUCTION

1.1 PURPOSE

In light of the recent pandemic outbreak, one of the great challenges of our times has become a lack of human connection. Transitioning into the online world has not been easy for most, finding that they have lost the essential boundary between the personal and professional, the self and the other, and most importantly between the advantages and disadvantages of constant availability. In a different time, one would meet their friends for a couple of hours and then the rest of the day would be theirs but in our current reality, the meetup is spread out over the whole day. No definite beginning and end to any conversation. In search of a solution to this problem, we can look back at history, to the practice of writing to a penpal.

What is a penpal?
    Penpal is a combination of two words. Pen - the instrument to write and Pal - meaning friend. A penpal is someone with whom you communicate via letters. They are usually strangers whose relationship is based primarily, or even solely, on their exchange of letters / emails. Your penpal doesn't have to be from the same area or even the same country as you. The only requirement is that you can understand what they have sent. Thus, it isnt uncommon for people to have pen pals in other countries to practice reading and writing in a foreign language, to learn more about other countries and life-styles.

Many mental health charities offer pen pal schemes to support people through particular challenges such as depression. Most people report benefits of boosted happiness, supporting brain development, increased connection, feelings of acceptance, cross-cultural learning and even boosting physical health. Having a pen pal and writing more can help ease anxiety, loneliness and even relieve stress. These are factors all adults could benefit from, particularly given increasing rates of burnout, stress and loneliness.

1.2 SCOPE

The current networking platforms such as WhatsApp, Facebook etc all share a lot of similarities, the essential difference that our application provides is in the pace of exchange. When we text someone, we expect a reply within a day or less. When it comes to writing to a penpal, a reply is not expected instantaneously. Days, weeks or even monthly replies are not uncommon. Another important difference is the length of the correspondence. A text message is generally not more than a few sentences long and is generally about a specific topic whereas a pen pal letter is

paragraphs long and can have descriptions about anything from daily routines to dreams and hopes. Pen Pal letters are a way to talk at length, about anything you are interested in.

This serves the essential need for a platform for safe and healthy community building. This type of outreach has been possible to set up because of the internet & technology. It is also no surprise that bridging this communication gap will be more important than ever before, thus ultimately leading to mass paranoia when things go back to normal.

While this can be attributed to the fact that such a pandemic has never plagued before, the proposed pen pal organization "Penpal" is designed to tackle some of these challenges by:

a) Find a new friend who doesn't judge you
b) Improves writing skills
c) Globally connecting people from all around the world
d) More scope for collaboration of work & studies
e) Learning about completely new things, countries, people

Software Requirement Specification

2.1 Software Requirements

● Operating System: Windows/Linux

● Backend: XAMPP Server

● Front end tool: Any browser

● Database: MariaDB with XAMPP

2.2 Hardware Requirements

● Processor: Pentium IV

● Hard Disk: 40 GB

● Ram: 512 MB

2.3 Functionality

● **Creating Account**
    A new user is given an option to create a fresh account.

● **Login to existing account**
    An existing user can login to their account using their credentials.

● **Update password**
    A user can reset their password before logging in, in case they lose their
    credentials.

● **Update interests**
    After logging in, a user can update their interests from the provided broad list of
    interests, in the settings sections of their profile.
    This information is of utmost information, and will be used to filter out the perfect
    penpal for the particular user!

● **Update languages**
    A user can update the languages they are comfortable communicating in, from the

settings sections of their profile.
This information holds an important value, since a penpal is picked from the ocean of users, only if they can speak in a common language.

- **Send & receive messages**

  A user, if they have penpals, can send & receive messages from each other.

- **Last sent message interval**

  The last message sent interval for every penpal of a user is displayed on screen.

- **Add new penpal**

  This is the highlight of this application.
  A user can add new penpals based on the maximum number of common interests they share and speak at least one common language for proper communication.

- **Delete penpal**

  A user is given the option to delete a penpal relationship.
  This is a necessary feature to provide privacy, avoid bullying etc for users.

- **Multiple penpals**

  A user can have multiple penpals.
  The maximum number of penpals a user can have is restricted to 4, considering various factors concerned with other users.

- **Display penpals**

  A user can easily find all their penpals listed on their dashboard

ER Diagram

Relational Schema

Interests	
email	interest_name

Languages	
email	language

Users		
email	name	password

Route		
route	pen_id	sender

Penpals		
pen_id	user1	user2

Messages		
whens	route	content
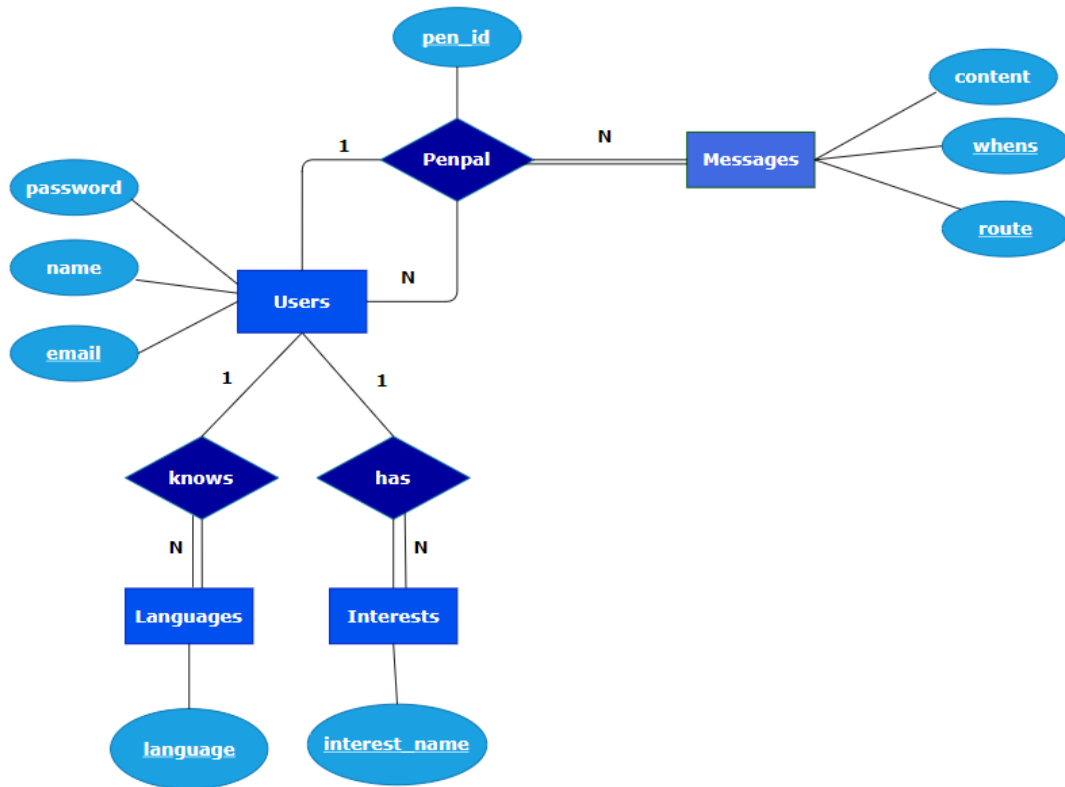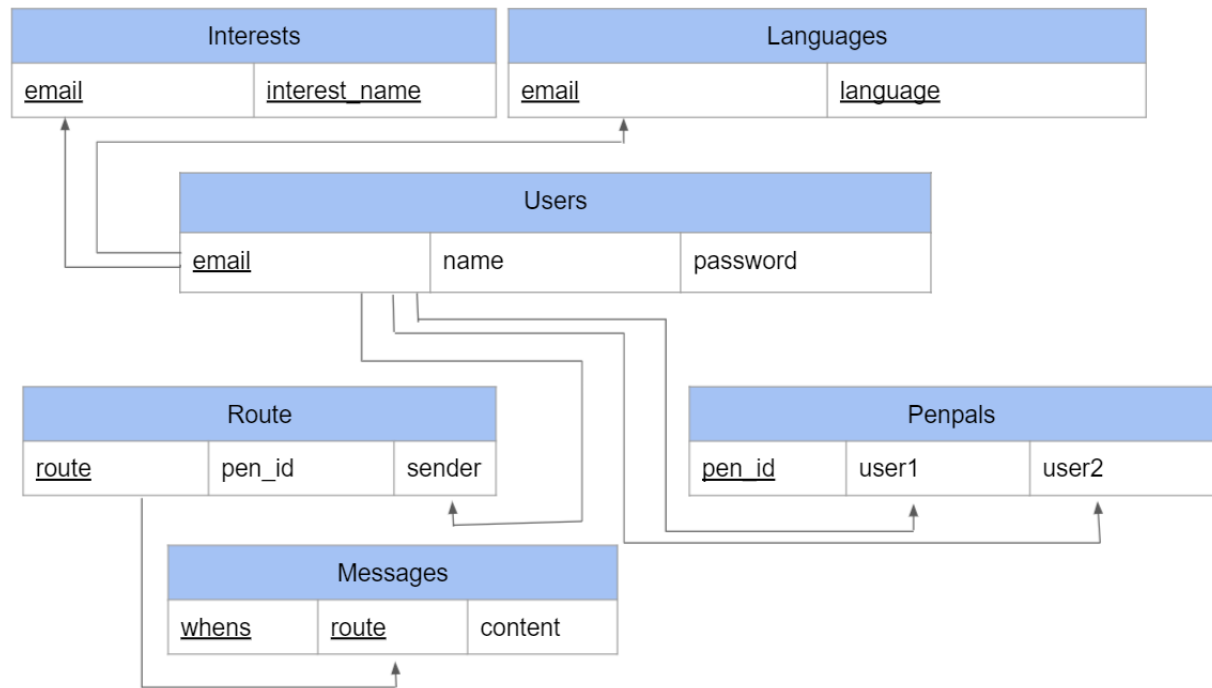
Implementation

5.1 SQL queries

(1) CREATING TABLES

```
CREATE TABLE Users (
    email VARCHAR(50) NOT NULL,
    name VARCHAR(50),
    password VARCHAR(50),
    PRIMARY KEY (email)
);
CREATE TABLE Interests(
    email VARCHAR(50) NOT NULL,
    interest_name VARCHAR(50) DEFAULT 'Random',
    PRIMARY KEY (email, interest_name),
    FOREIGN KEY (email) REFERENCES Users (email)
    ON DELETE CASCADE
    ON UPDATE CASCADE
);
CREATE TABLE Languages (
    email VARCHAR(50) NOT NULL,
    language VARCHAR(50) DEFAULT 'English',
    PRIMARY KEY (email, language),
    FOREIGN KEY (email) REFERENCES Users (email)
    ON DELETE CASCADE
    ON UPDATE CASCADE
);
CREATE TABLE Penpals (
    pen_id INT NOT NULL AUTO_INCREMENT,
    user1 VARCHAR(50) NOT NULL,
    user2 VARCHAR(50) NOT NULL,
```

```
            PRIMARY KEY (pen_id),
            FOREIGN KEY (user1) REFERENCES Users (email),
            FOREIGN KEY (user2) REFERENCES Users (email)
            ON DELETE CASCADE
            ON UPDATE CASCADE
        );
        CREATE TABLE Route (
            route INT NOT NULL AUTO_INCREMENT,
            pen_id INT NOT NULL,
            sender VARCHAR(50),
            PRIMARY KEY (route),
            FOREIGN KEY (pen_id) REFERENCES Penpals (pen_id),
            FOREIGN KEY (sender) REFERENCES Users (email)
            ON DELETE CASCADE
            ON UPDATE CASCADE
        );
        CREATE TABLE Messages (
            whens DATETIME DEFAULT CURRENT_TIMESTAMP,
            route INT NOT NULL,
            content TEXT(1000),
            PRIMARY KEY (route, whens),
            FOREIGN KEY (route) REFERENCES Route (route)
            ON DELETE CASCADE
            ON UPDATE CASCADE
        );
```

(2) INSERTING VALUES

```
        INSERT INTO Users VALUES(?, ?, ?);
        INSERT INTO Interests(email) VALUES (?);
        INSERT INTO Languages(email) VALUES (?);
        INSERT INTO Penpals(user1,user2) VALUES (?, ?);
        INSERT INTO Route(pen_id,sender) VALUES (?, ?);
```

```sql
INSERT INTO Messages(route,content) VALUES (?, ?);
INSERT INTO Messages(route,content) VALUES (?, ?);
INSERT INTO Interests VALUES (?, ?);
INSERT INTO Languages VALUES (?, ?);
```

(3) UPDATING VALUES

```sql
UPDATE TABLE Interests SET interest_name = ? WHERE username = ?;
UPDATE TABLE Languages SET language = ? WHERE username = ?;
```

(4) READING LAST MESSAGE & TIME

```sql
SELECT route from Route
WHERE pen_id =
(SELECT pen_id FROM penpals
WHERE user1 IN ('meganraj251@gmail.com', 'lmao@gmail.com')
AND user2 IN ('meganraj251@gmail.com', 'lmao@gmail.com'))
AND sender = 'meganraj251@gmail.com';


INSERT INTO Route (pen_id,sender) VALUES  (?, ?);
SELECT route FROM Route WHERE pen_id = ? AND sender = ?;


INSERT INTO Messages(route,content) VALUES (?,?);


SELECT content FROM
(SELECT MAX(whens) AS time, content FROM Messages  WHERE route =
(SELECT route FROM Route
WHERE sender = ? AND pen_id = ?)) AS A;


SELECT time FROM
(SELECT MAX(whens) AS time, content FROM Messages WHERE route =
(SELECT route FROM Route WHERE sender = ? AND pen_id = ?)) AS A;
```

(5) DELETING PENPAL

DELETE FROM Penpals WHERE

(SELECT pen_id FROM Penpals WHERE

(user1 = ? OR user2 = ?) AND (user1 = ? OR user2 = ?));

(6) FIND PENPAL, USAGE OF VIEWs

CREATE VIEW my_pals AS

SELECT y.email, MAX(y.num)-1 AS counters FROM

(SELECT COUNT(email) AS num, email FROM Interests

WHERE interest_name IN (SELECT interest_name FROM Interests

WHERE email = ?) AND email <> 'meganraj251@gmail.com'

GROUP BY email) y GROUP BY email HAVING MAX(y.num) != 1

ORDER BY counters DESC;

CREATE VIEW potentials AS

SELECT DISTINCT my_pals.email, my_pals.counters FROM

my_pals NATURAL JOIN Languages WHERE language IN

(SELECT language FROM Languages WHERE email = ?);

CREATE VIEW filtered AS

SELECT * FROM potentials WHERE

!(email IN (SELECT user1 FROM penpals WHERE user2 = ?)

OR email IN (SELECT user2 FROM penpals WHERE user1 = ?));

SELECT email FROM filtered

WHERE counters = (SELECT MAX(counters) FROM filtered) LIMIT 1;

DROP VIEW potentials;

DROP VIEW my_pals;

DROP VIEW filtered;

INSERT INTO Penpals (user1, user2) VALUES (?, ?);

5.2 Connecting backend to frontend

The connection is established from the frontend HTML to the XAMPP server and the database using PHP, which is a server side scripting language.

It is used to execute the following tasks:

- Making a connection to the server & database
- Create new user accounts
- Check & confirm login credentials & logout
- Updating user interests & languages
- Viewing & deleting penpals
- Add a new penpal, using views, and common qualities
- Send and receive messages from penpal relationships

```php
<?php
session_start();

$servername = "localhost";
$username = "root";
$password = "";
$dbname = "DBMS";

// email, password
$rem = $_POST["remember"];
$email = $_POST["email2"];
$pw = $_POST["pw2"];

// Create connection
$conn = new mysqli($servername, $username, $password, $dbname);
// Check connection
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
```

```php
}

$sql = "SELECT * FROM Users where email = '$email' && password = '$pw'";
$result = $conn->query($sql);

if (mysqli_num_rows($result) > 0) {
    $row = $result->fetch_assoc();

    $_SESSION['logged_in'] = 1;
    $_SESSION['username'] = $row["name"];
    $_SESSION['email'] = $email;
    $_SESSION['user_pw'] = $pw;

    if(isset($rem)) {
        setcookie ("email2",$_POST["email2"],time()+ 3600);
        setcookie ("pw2",$_POST["pw2"],time()+ 3600);
        echo "Cookies Set Successfuly";
    }

    $sql = "SELECT * FROM Penpals where user1 = '$email' or user2 = '$email'";
    $result = $conn->query($sql);

    $_SESSION['numOfPenpals'] = mysqli_num_rows($result);

    if (mysqli_num_rows($result) > 0) {
        $i = 1;
        while($row = $result->fetch_assoc()) {
            $_SESSION['penpal_id_'.$i] = $row["pen_id"];

            if($row["user2"] <> $email)
                $_SESSION['pal_'.$i] = $row["user2"];
            else
                $_SESSION['pal_'.$i] = $row["user1"];
            $i++;
```

```php
        }
    }

    // echo "Success";
    header('Location: http://localhost/PHPfiles/PenPals/dashboard.php');
    exit;
}

// echo "Fail";
header('Location: http://localhost/PHPfiles/PenPals/index.php');
exit;

$conn->close();

?>
```

Conclusion

6.1 Summary

Our application 'Penpal with me' has the ability :-

★ It allows the users to find another user as a penpal based on common interests

★ It allows the users to view and send messages to penpals.

★ It allows the users to delete penpals

★ It allows the users to update interests and language preferences

6.2 Limitations

While the proposed system accomplishes in tackling a vast set of drawbacks present from the existing system, it does come with its own fair share of caveats that might need further enhancing and looking into in order to make it even more seamless.

1) This system currently requires internet access to enter data using the web interface. Having this system available on smartphones and mobile devices using downloadable apps would increase access and improve functionality and flexibility.
Thus, even amplifying the reach of the application making it more affordable to everyone across the country.

2) The current penpal organization restricts users to have more than 4 pen pals because of various contributing factors such as low space on the database, and to let users actually connect with the people they talk to, contrasting the fully fledged peer-2-peer networking platforms such as Gmail, Instagram, Facebook etc.

3) The options to choose languages & interests from are limited to a set of a few broad categories in this version of the web application. Users can be allowed to add custom based personal interests & local languages in the future versions.

4) This initial version of the application supports penpal relationships between 2 users. However, a group of users sharing common interests can be pooled to build a strong and healthy community.

5) Current application lets the user view only the last message sent / received.
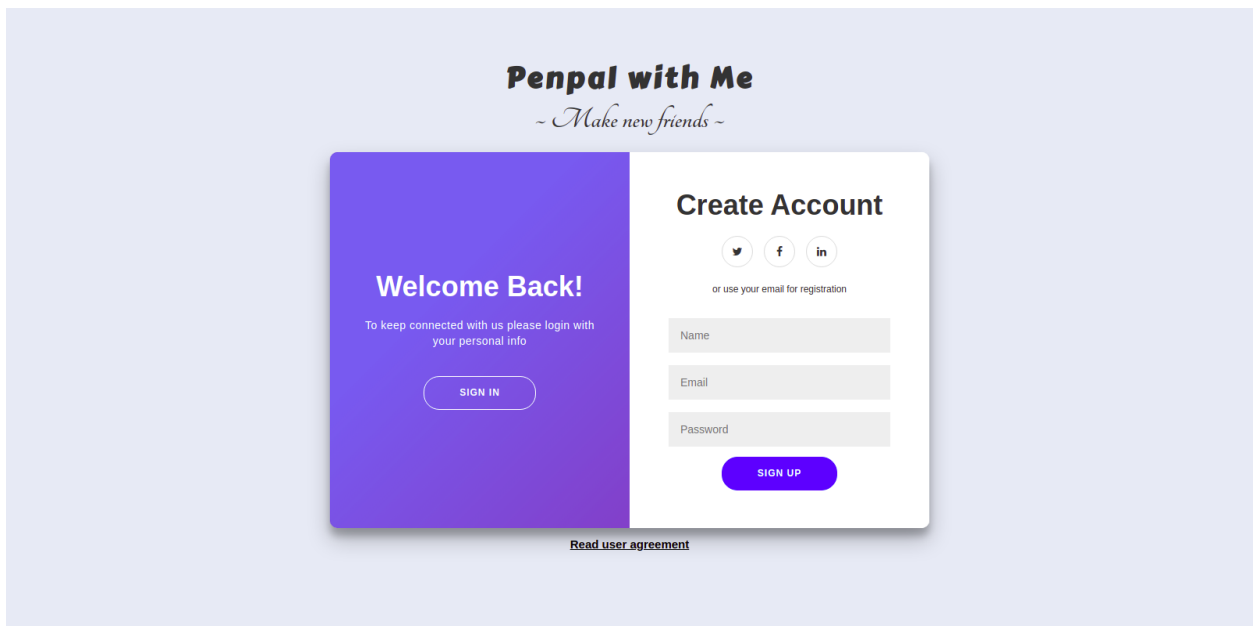
6.3 Further enhancements

Some of the future enhancements (including the limitations that can use further resolving) that'd make the system even more practical would be as follows:

1) Group penpals sharing similar interests
2) Develop features to allow users to report & block bullies
3) Allow users to attach images & multimedia content in their messages
4) Alert users as a reminder to text their penpal

References

1) Database Systems : The complete book by Molina, Ullman and wisdom
2) https://www.geeksforgeeks.org/
3) https://www.w3schools.com/
4) https://www.javatpoint.com/

Appendix: Snapshots

Penpal with Me
~ Make new friends ~

Sign in

or use your account

Email

Password
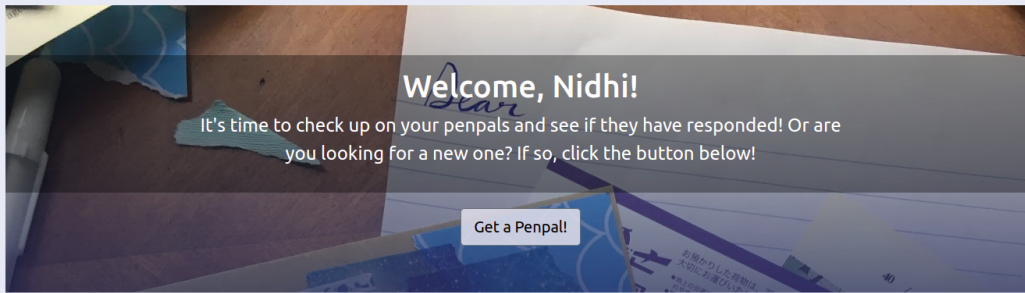
☐ Remember Me

Forgot your password?

SIGN IN

Hello, Friend!

Enter your personal details and start journey with us

SIGN UP

Read user agreement

Penpal with Me
~ Make new friends ~

Welcome Back!

To keep connected with us please login with your personal info

SIGN IN

Create Account

or use your email for registration

Name

Email

Password

SIGN UP

Read user agreement

Welcome, Nidhi!

It's time to check up on your penpals and see if they have responded! Or are you looking for a new one? If so, click the button below!

Get a Penpal!

Penpal 1

Meghana

Last message 3 hours ago

Send Message! | Delete Penpal

Penpal 2

booger

Last message 3 hours ago

Send Message! | Delete Penpal

Penpal with Me

It's time to che   ponded! Or are
you l   elow!

Profile Settings

Your info ;) ⌃

Hey, Nalina.
We are extremely grateful that you chose to use your website! We hope you have an excellent day ^-^

Update Interests ⌃

☐ Art (Painting / Sketching etc)
☐ Anime
☐ Gaming
☐ Music
☐ Movies / TV Shows
☐ Tech field

Save changes

Update Languages ⌄

Save changes   Log Out
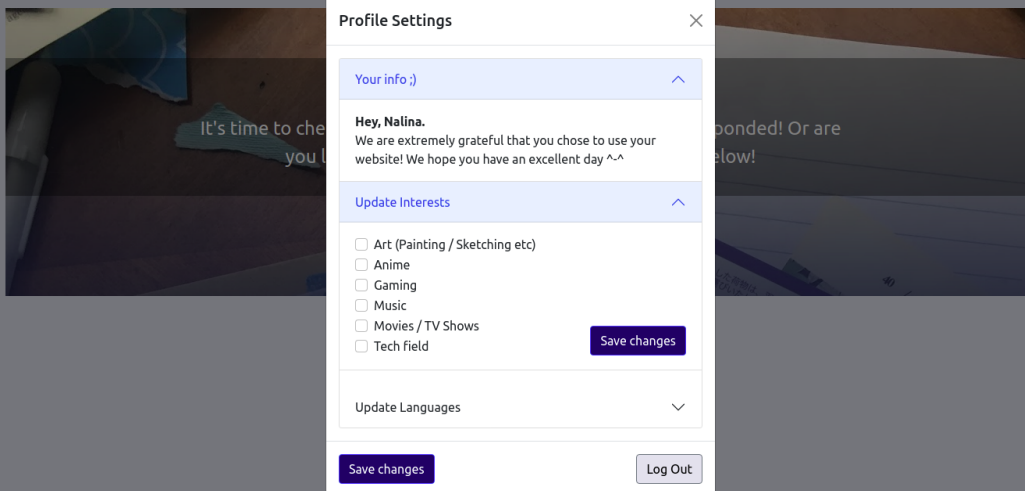
Send a message to : booger

Hello, let's chat!

Send it!

From you,

Organizations can be split into three main categories: free,
partial subscription, and subscription-based clubs. Free clubs
are usually funded by advertising and profiles are not
reviewed, whereas subscription-based clubs will usually not
contain any advertising and will have an administrator
approving profiles to the database