

ITM 4TH YEAR PROJECT

StudentPool

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Executive summary

This is a carpooling service for students named StudentPool with the goal of reducing CO2 emissions in Ireland and aiding students financially in terms of cost of fuel through the use of various IT technologies and online resources.

With the continuous increase in cost of living throughout Ireland and the rise of fuel prices, university, and college students as well as other members of the public are finding it increasingly financially difficult as time goes on in relation to commuting to and from their educational institutions. This carpooling concept can also aid to reduce emissions and help Ireland's fight on reducing CO2 emissions for privately owned vehicles.

This project uses various technologies and online resources. These technologies for each of the different sections during the life of this project are outlined in the business, ethical, and technical headings. For the business section of the projects, Google AdSense was used to aid in generating revenue using advertising.

For the ethical side of the project, multiple online resources were used to gather information about the production of CO2 emissions by privately owned vehicles in Ireland. Why this data was sought is for the reason that if students who drive their own private vehicles to and from their education institutions that they are contributing to producing these CO2 emissions when if they were to use this carpooling service the CO2 emissions would reduce significantly as less students would be driving their own vehicles, reducing the number of vehicles on the road by carpooling with other students. Furthermore, information regarding how much the price of a litre of fuel, both for diesel and petrol, was gathered to further illustrate the rising cost of living in Ireland and how if students are to avail of this service, then these prices would be cut for them significantly. It was found that the average price for petrol per litre increased by 3.7% from the months of January to late the middle of February 2023, and the average price for diesel per litre increased by 5.8% from the months of January 2023 to the middle of February 2023, and the prices of both diesel and petrol continued to rise.

For the technical side of the project, multiple technologies were tried and tested throughout the course of this project. The idea of this project being that a user signs up through a form and from here their information is stored into a database. The information being, the users name, their email address, which town in which they are in, which educational institution they are in, and whether they are a driver or a passenger, this information is passed into the database. The user is then emailed their newly generated hashed password which they need for the next screen, which is a change password screen, this is for security reasons as to why they receive a hashed password. The user enters their email on the change password screen form as well as their newly generated hashed password, and then a new password they need to choose for themselves. This is because a user will find it difficult to remember a randomly generated hashed password whenever they attempt to log in. The user is then brought to a login screen in which they enter their email and their newly created password. Once the details are correct, they are brought to another screen in which a map of the town they chose previously in the sign-up screen is generated with icons indicating there are

drivers or passengers in that area (if there are any drivers or passengers). If the user clicks on these icons, they will see an email address of the driver or passenger. If the icon is of the colour red, it indicates that user is a driver and if the icon is green, it indicates that a user is a passenger. The idea of the two different colours is that if a driver is looking for passengers, they will look for green icons and vice versa. If the user sees that there are no drivers or passenger icons on that screen, they can choose another town/area from a dropdown menu and will be brought to another page displaying that town/area once they click the submit button. It is up to the user to contact the other users by email using the email addresses displayed on the icons. Once the user has done what they need to do they can simply logout and will be brought back to the login screen.

Introduction

This project is named StudentPool. It is a carpooling service for students of Ireland who wish to avail of carpooling in order to reduce their costs of commuting to and from their educational institutions. Users fill out three simple forms, a sign-up form, a change password form, and a login form. From this, the user is brought to a page which displays a map of a town in which they entered in the sign-up form with other users in the area also availing of this service. With this service in place, it can greatly reduce the number of emissions private cars that commute to and from college/university institutions by reducing the number of vehicles on the road.

StudentPool uses various technologies and programming languages, they are as follows:

- HTML
- PHP
- MySQL
- PHPMyAdmin
- Apache64
- Python
- Google AdSense
- PayPal
- SQL

Business section

Task 1:

For task 1 of the project for the business aspect, research was carried out to find out a good source to use for a means of creating revenue for the student carpooling service. Google AdSense was chosen as it is an easy-to-use tool for allocating space on your website to create revenue. Once Google AdSense was chosen, there was several steps to get it up and running, these included:

- Provide an email address
- what type of service it is required for
- what type of sector should it generate advertising for in which the car sector was selected.

It then created a simple webpage for the student carpooling (<https://business.google.com/site/l/13002111453624565371?hl=en-GB>).

AdSense in three steps

1. You make your ad spaces available



You make your ad spaces available by pasting ad code on your site, and choose where you want the ads to appear.

2. The highest paying ads appear on your site



Advertisers bid to show in your ad spaces in a real-time auction. The highest paying ads show on your site.

3. You get paid



We handle the process of billing all advertisers and networks for the ads on your site, to make sure you receive your payments.

Figure 1: Google AdSense

This website which was created was eventually discarded. Instead, custom ads were created using Google AdSense to use and paste into the student carpool website application. Google AdSense then gives you a snippet of the ad code in which you just add into your HTML code and Google AdSense essentially takes care of the rest of the work and your website now has adverts. These custom ads were created in a quick and easy manner by doing the following:

- Navigating to <https://www.google.com/adsense>
- In the left side bar, navigate to “Ads”
- Click the “By ad unit” tab
- There is a choice of 4 ads to choose from, “Display ads” were chosen
- Simple name the ad as to what you want and click create
- You are then given a code snippet to paste into your HTML code

HTML
AMP

Copy and paste the ad unit code in between the <body></body> tags of your pages
 Place this code where you want an ad to appear. Do this for each individual ad unit, on every page.

```

<script async src="https://pagead2.googlesyndication.com/pagead/js/adsbygoogle.js?client=
  crossorigin="anonymous"></script>
<!-- new ad -->
<ins class="adsbygoogle"
  style="display:block"
  data-ad-client="ca-pub-1592624621410511"
  data-ad-slot="9396674915"
  data-ad-format="auto"
  data-full-width-responsive="true"></ins>
<script>
  (adsbygoogle = window.adsbygoogle || []).push({});
</script>
  
```

[Copy code snippet](#)

It usually takes a few minutes for ads to appear on the page but occasionally it can take up to an hour. See our [code implementation guide](#) for more details.

Figure 2: Google AdSense ad code snippet to paste into own website.

The use of Google AdSense as a means of creating revenue is a proof of concept as the ads currently do not display on the screens as the project is run on a localhost machine and not on the internet, if the project was run on the internet instead, then the ads would display on each of the screens.

Task 2 (Stripe):

For Stripe to be set up and linked with the projects. First, an account was set up with Stripe with the email address C00192937@itcarlow.ie. When the account was verified and steps were followed the account was set up. Once this was set up, details on the project (business) were entered. Also, personal details were entered as in name, address, phone number etc. This is yet to be completed as it wants bank details in order for it to be finalised. From this, a form will need to be made in order receive the users' details and bank details in order to pay the one-time fee.

The use of stripe was eventually decided against as using PayPal proved to be the easiest to implement and better option.

Task 3 (PayPal):

Instead of using Stripe, PayPal was the technology decided upon. The idea of using PayPal was to charge the users a one-time fee of €2 to create a means of revenue for the website application.

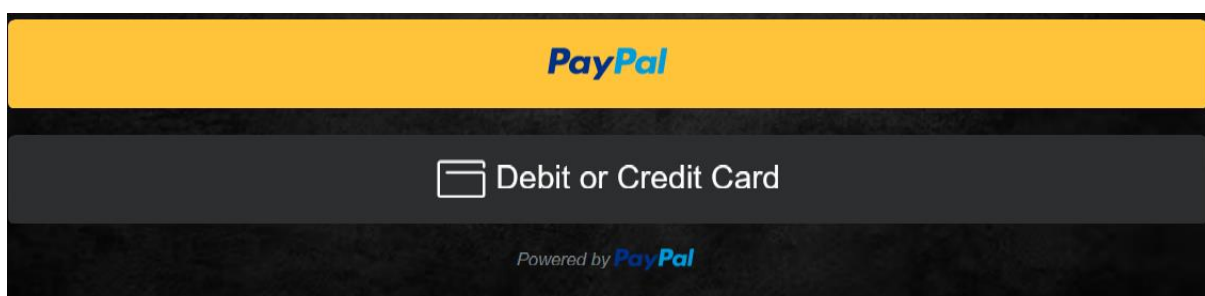


Figure 3: PayPal buttons

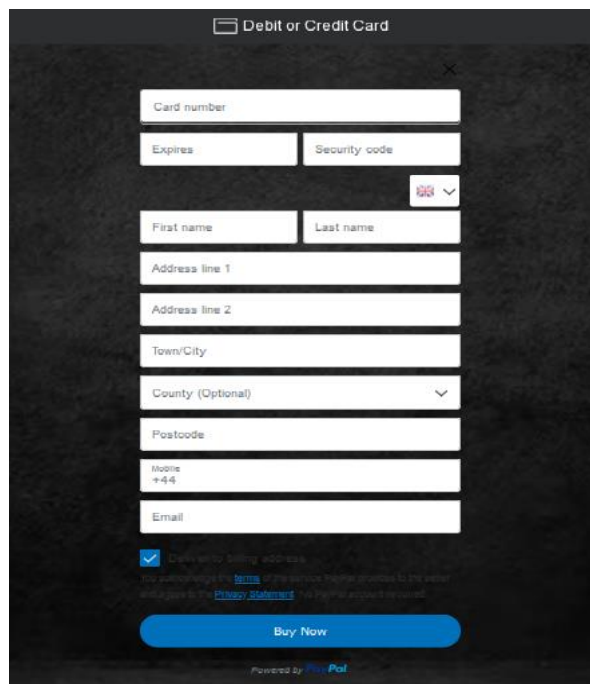
The image shows a dark-themed PayPal payment form titled "Debit or Credit Card". It contains several input fields: "Card number", "Expires" (with a calendar icon), "Security code" (with a "VISA" logo and a dropdown arrow), "First name", "Last name", "Address line 1", "Address line 2", "Town/City", "County (Optional)" (with a dropdown arrow), "Postcode", "Mobile +44", and "Email". At the bottom, there is a checked checkbox for "Save this billing address" with a small disclaimer below it, and a prominent blue "Buy Now" button. The text "Powered by PayPal" is visible at the very bottom.

Figure 4: PayPal debit/credit card payment form

Using PayPal as a means of paying the subscription is currently a proof of concept. The concept was to have a user sign-up and once the user filled out their details, they would then pay the one time fee of €2 and then would have complete access to the carpooling service.

Ethical section

Task 1 (CO2 emissions produced by private cars in Ireland):

For task 1 of the project for the ethical aspect, research was carried out to figure out the average CO2 emissions a privately owned vehicle would produce annually in Ireland. Multiple websites and different sources were analysed and the website/source that was chosen was www.solarshare.ie, as this website/source has data on these CO2 emissions to a relatively up to date time frame, from 2003 up until 2021 in Ireland. During the research for this data, it was proving to be difficult to find any information on emissions that are produced by students who drive to their education institutions for recent years especially the years 2020 up until 2022 due to the Covid-19 pandemic, instead research for all private owned vehicles in Ireland was investigated.

Graph 1: Average CO₂ of new private vehicles bought in Ireland 2003-2021 for first ten months of the year in each case – Jan to October (Source: Cartell Carstat)

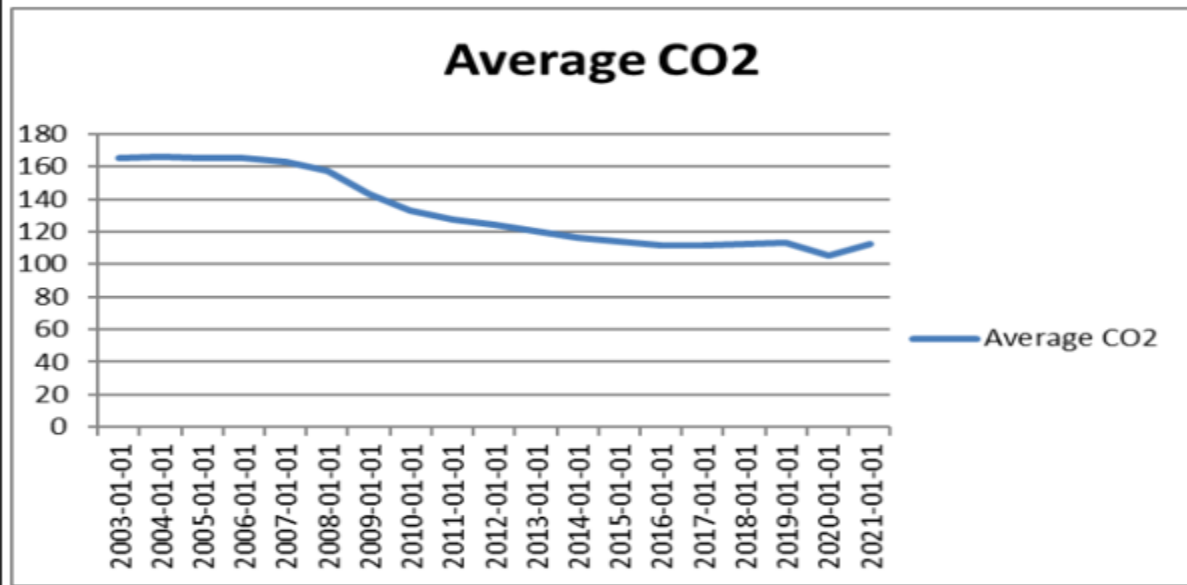


Figure 5: Average CO₂ of new private vehicles bought in Ireland 2003-2021 for first ten months of the year on each case – January to October (Source: Cartell Carstat)

Task 2 (Price of fuel in Ireland):

For task 2, the price of fuel in Ireland was researched to give an understanding of how much it would cost a student driving their own vehicle to and from their educational institution. What was found was that the price of fuel in 2022 on the 07-11-2022 was around €1.80 a litre for petrol on average, and €2.00 a litre for diesel on average. This further illustrates that's the cost of commuting to and from a student's educational institution can prove to be very heavy on the students pocket and if the student were to use this carpooling service, along with other students, they can easily cut their expenditure on fuel drastically.

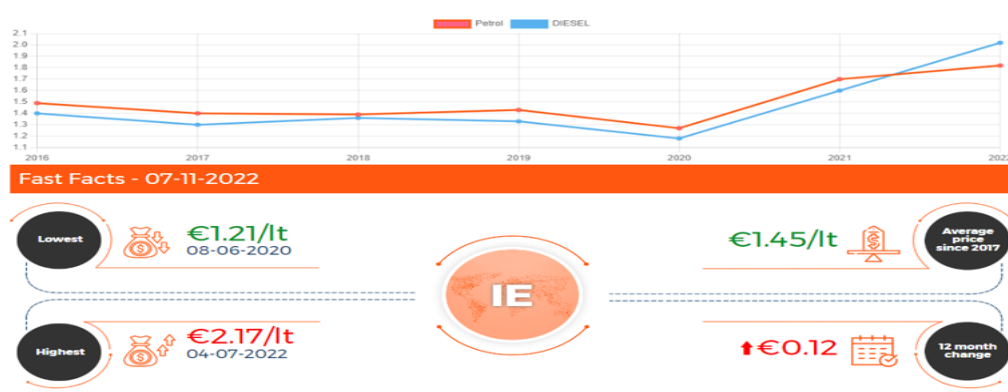


Figure 6: Price of fuel between the years 2016 – 2022

Task 3 (Private vehicles contributing to carbon footprint):

Research was carried out to find a way that this project could help to reduce emissions even further on which an article from www.irishexaminer.com was found. This article illustrated a report by the Social Justice Ireland which showed that there was less public transportation

means in rural areas of Ireland and that these rural areas rely heavily on their own private vehicles. From this, if students that reside in these areas have access to this carpooling service, then this can greatly reduce the carbon footprint from their privately owned vehicles, aid the students who do not have access to their own private vehicle, and of course aid students financially. “The report also stated that people in rural Ireland are forced to use their cars due to lack of public transport.” [1, www.irishexaminer.ie].

Task 4 (Rise in fuel prices):

Research was also carried out to find out the increase in fuel prices in Ireland. From this, the website www.globalpetrolprices.com showed the price of petrol and diesel. It illustrates that there is a decrease in the price of petrol from the beginning of November 2022 and an increase in price of petrol at the beginning of January for the year of 2023 and shows it to be gradually increasing past the 30th of January 2023 into February. The price of diesel was very similar in which the price began to drop in the month of November 2022 and began to increase again at the beginning of the year 2023.

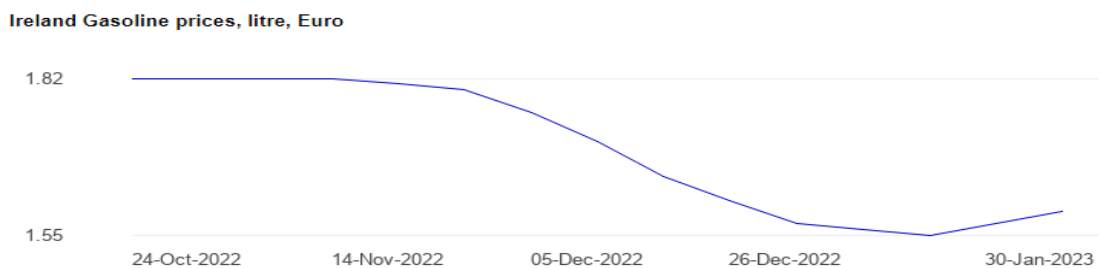


Figure 7: Decrease and increase of the price of petrol from late 2022 to early 2023.

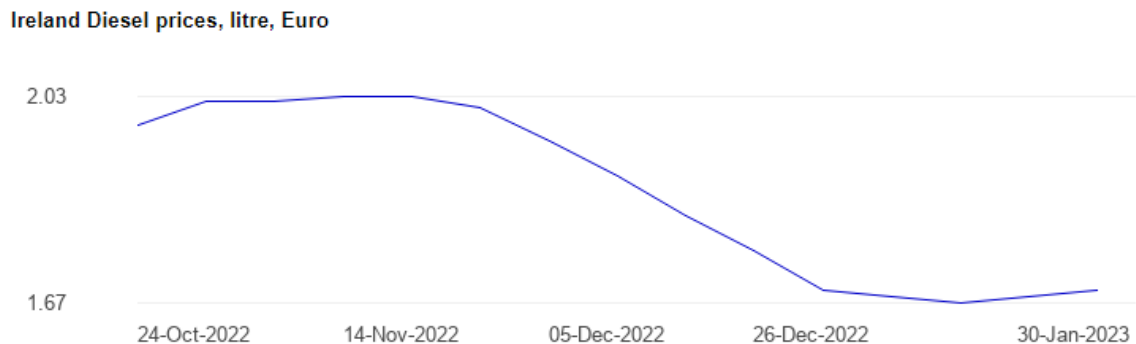


Figure 8: Decrease and increase of the price of diesel from late 2022 to early 2023

Further research was taken from the same source, www.globalpetrolprices.com, from the months of January 2023, up until February 2023 to have a better understanding of the increase in the price of fuel from a relatively up to date time frame. The rise of petrol continued to rise from the beginning of January 2023 and only began to slowly decrease from the middle of February 2023.

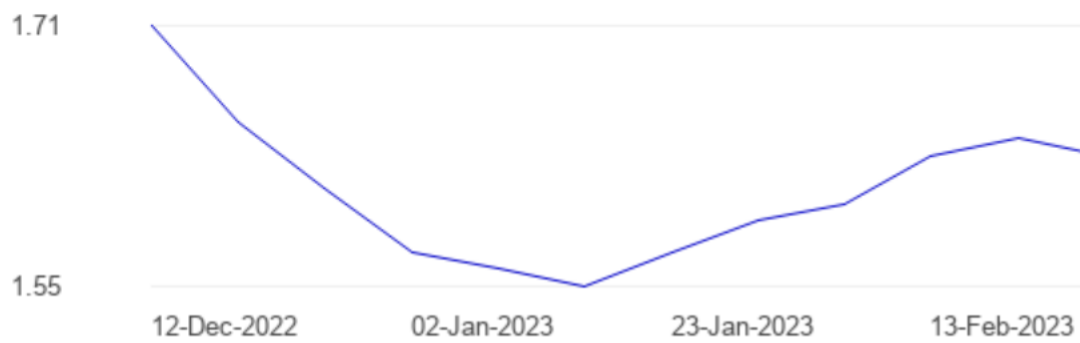


Figure 9: Decrease and increase of the price of petrol from the months of late December 2022 – mid February 2023.

Using the same source, www.globalpetrolprices.com, the price of diesel was also researched, and it was found that in the same time frame from the beginning of January 2023 to the middle of February 2023. The price of diesel somewhat followed the same trend as petrol but is slightly more expensive.

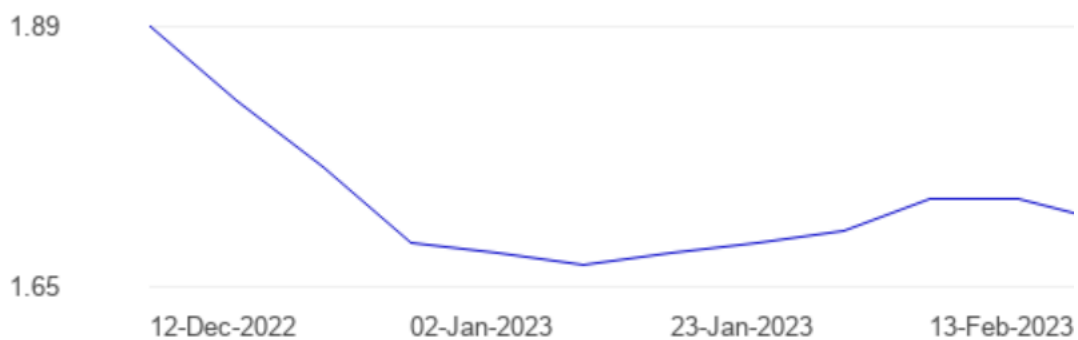


Figure 10: Decrease and increase of the price of diesel from the months of late December 2022 – mid February 2023.

Technical section

Issues faced:

The first technical issue that was encountered throughout the life of this project was setting up a database as well as carrying out all the work throughout the life of the project on a Linux environment. Setting up the database proved to be a challenge as it was to be originally set up using a Linux environment on a virtual machine. This could not happen due to installation errors that were due to the proxy server in the college, SETU Carlow, not allowing connection to the internet. Due to this, the idea of using Linux was scrapped and so Windows was the alternative as there was a connection to the internet on a Windows environment.

The second technical issue which was encountered during the life of this project was receiving and sending the email which generated the random hashed password for the users for security by using the VM(Virtual) environment. Due to the college, SETU Carlow, not allowing SMTP (Simple Mail Networking Protocol) on the internal network, using the virtual

environment proved to become a serious issue. If the project was to continue, the project had to be migrated completely from a virtual environment to a local environment.

The third technical issue that was encountered throughout the life of this project was because the website application needs the internet to run properly, all the files were migrated to Plesk and was to be hosted on Plesk as this provided a platform to display what needed to be displayed on the internet. Unfortunately, Plesk does not support Python. Python is needed for this project to allow users to be emailed and also to generate the map from the users information in the database as a Python script runs and pulls the users town from the database so it can display that town once the user logs in as well as displaying other towns if the user chooses to select another town. Therefore, a WAMP server (Apache64) was used to replace the use of Plesk. This WAMP server was installed from an online source and all the files were then migrated from the Plesk server to a folder on the localhost, the folder *www*, and from here is where all the files are saved and ran from.

The final technical issue encountered during this project was getting the adverts to display on each of the screens. The code for the adverts have been pasted from Google AdSense into the HTML code for the screens but because this project is run on a local machine the ads do not display.

Task 1 (creating a mock database for testing):

For task 1 of the technical aspect and the work completed, a mock database was set up using MySQL and Workbench. This was set up just to illustrate what the database will be represented with the two tables, one for towns and one for users. These tables will be used for two forms, one for inserting users' information into the database and another for a user searching for a driver or a passenger. The IDE that was used to create this mock database was MySQL Workbench.

The towns table include the columns townid, tname (for town name), longitude, and latitude. The users table include the columns id, fname (first name), sname (second name), institution, email, timestamp, and deleteflag. These will be both the tables and columns used for the database that will be set up.

Instead, the database will be set up on Windows environment once MySQL has been installed properly. Alternative databases were investigated like Oracle and SQL Server, but both databases proved to be too difficult and hard to manage so MySQL was chosen.

Task 2 (Creating a user form):

For task 2 of the technical aspect, a simple user form was created using the language HTML and the text editor Notepad++. This user form will record the user's data into the user table within the database, it will record the users first name, their second name, the town in which they are form a drop-down list, their email address, their educational institution, and whether they are a passenger or a driver. This form will also inform the user if they have not filled out the form in its entirety or if they have made any errors like if they enter their email address but forget to use the @ symbol. This task was originally meant to just enable a user to register for the carpooling service but instead of having to register, then be brought to this form and provide the above details and then must fill another form to indicate whether

the user was looking for a driver or a passenger, the register form was dropped as the same can be done with just two forms instead of three.

```

1 <html>
2 <body>
3 <div align="middle">
4 <form action="" method="POST">
5 <table border="0" width="300">
6 <tr>
7 <td><label>Enter your first name:</label></td><td><input type="text" name="fname" required /></td>
8 </tr>
9 <tr>
10 <td colspan="2"><input type="button" value="Next" /></td>
11 </tr>
12 <tr>
13 <td><label>Enter your last name:</label></td><td><input type="text" name="lname" required /></td>
14 </tr>
15 <tr>
16 <td colspan="2"><input type="button" value="Next" /></td>
17 </tr>
18 <tr>
19 <td colspan="2"><label for="towns">Select your town:</label></td>
20 </tr>
21 <tr>
22 <td colspan="2"><select name="towns" id="towns">
23 <option value="Carlisle">Carlisle</option>
24 <option value="Portlaoise">Portlaoise</option>
25 <option value="Mallow">Mallow</option>
26 <option value="Waterford">Waterford</option>
27 </select>
28 </td>
29 </tr>
30 <tr>
31 <td colspan="2"><input type="button" value="Next" /></td>
32 </tr>
33 <tr>
34 <td colspan="2"><label>Select if you are a passenger or a driver:</label>
35 <input type="radio" id="driver" name="driver" value="driver" />
36 <label for="driver">driver</label><input type="radio" id="pass" name="pass" value="passenger" />
37 <label for="pass">passenger</label></td>
38 </tr>
39 <tr>
40 <td colspan="2"><input type="button" value="Next" /></td>
41 </tr>
42 <tr>
43 <td colspan="2"><input type="button" value="Next" /></td>
44 </tr>
45 <tr>
46 <td colspan="2"><label for="email">Enter your email:</label></td><td><input type="email" id="email" name="email" required /></td>
47 </tr>
48 <tr>
49 <td colspan="2"><input type="button" value="Next" /></td>
50 </tr>
51 <tr>
52 <td colspan="2"><label>Enter your educational institution:</label></td><td><input type="text" id="institute" name="institute" required /></td>
53 </tr>
54 <tr>
55 <td colspan="2"><input type="button" value="Next" /></td>
56 </tr>
57 <tr>
58 <td colspan="2" align="center"><input type="submit" value="Submit" /></td>
59 </tr>
60 </table>
61 </div>
62 </form>
63 </div>
64 </body>
65 </html>

```

Figure 11: User form HTML code on Notepad++

Also, PHP code was created to link the form to the database, the code was created with the use of Notepad++. This will create a link that will feed the information from the form into the database table *users* and will enter the information from the form illustrated in figure 4.

```

1 <?php
2 $hostname = "localhost";
3 $username = "";
4 $password = "";
5
6 $dbname = "";
7 //Creating a connection to DB
8 $con = mysqli_connect($hostname, $username, $password, $dbname);
9
10
11 //Inserting queries from web page to the database
12 $sql = 'INSERT INTO users (userID,fname,lname,institute,email,) VALUES ()'; //Query which enters the data from the form into the database
13
14 mysqli_query($con, $sql);
15
16 ?>

```

Figure 12: PHP code for user on Notepad++

Task 3 (Finding a driver/passenger form):

For task 3 of the technical aspect, another simple form was created using HTML and the text editor Notepad++. This form is to find a driver or a passenger in the user's area, the form then searches through the database and matches the records with that of what the user has entered and selected in the form. The form consists of the user selecting a town in which they are looking for a driver/passenger, select whether they are looking for a driver or a passenger by selecting the corresponding button, and then to enter their educational institution.

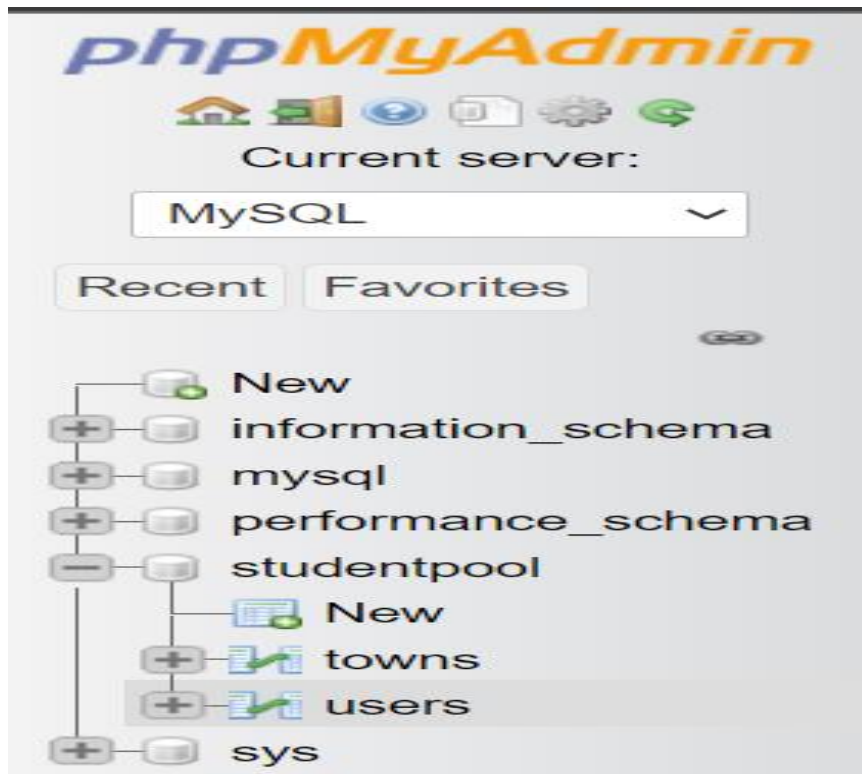


Figure 14: The studentpool database along with the towns table and the users table in PHPMyAdmin.



Figure 15: The users table and their fields.

SELECT * FROM `towns`

Profiling [[Edit inline](#)] [[Edit](#)] [[Explain SQL](#)] [[Create PHP code](#)] [[Refresh](#)]

1 > >> | Show all | Number of rows: 25

Extra options

tname	longitude	latitude
Mullingar	53.53333	-7.35
Arklow	52.79306	-6.14139
Ashbourne	53.51163	-6.39821
Athlone	53.43333	-7.95
Athy	52.99139	-6.98028
Balbriggan	53.61278	-6.18194
Blanchardstown	53.38806	-6.37556
Carlow	52.84083	-6.92611
Carrigaline	51.81167	-8.39861
Castlebar	53.85	-9.3

Figure 16: The towns table and their fields.

Task 5 (User/sign up form):

The overall layout of this form was changed to make it more user friendly. The two fields for the first name and the last name have been changed to represent one field where the user enters both their first and last name now only into one field, place holders were set so that the user doesn't misunderstand. 47 towns in Ireland were hardcoded into the form, more may be added so when a user does select their town that there will be a high chance that their town will be there. 10 universities/colleges were hardcoded to allow the user to choose from when they select their educational institution, more may be added so that there is a high chance the users institution will be there. The user then enters their email address, and a placeholder was added so that there is no misunderstanding.

Also, the PHP code to that the user/sign up form links to had been changed to include the relevant names.

Sign Up

Enter your name below:

Select your town: ▼

Select your educational institution: ▼

Enter your email address below:

We'll never share your email with anyone else.

Select if you are a passenger or a driver:

driver

passenger

Figure 17: user/sign up form.

```

<?php
$hostname = "localhost";
$username = "";
$password = "";
$Uname = $_POST['username'];
$Town = $_POST['towns'];
$Institute = $_POST['institute'];
$Email = $_POST['email'];
$Ustatus = $_POST['status'];

$dbname = "studentcarpool";
//Creating a connection to DB
$con = mysqli_connect($hostname, $username, $password, $dbname);

//Inserting queries from web page to the database
$sql = 'INSERT INTO users (userID,username,town,institute,email,ustatus) VALUES (null,$Uname,$Town,$Institute,$Email,$Ustatus)';

mysqli_query($con, $sql);
?>

```

Figure 18: PHP Code for user/sign up form.

This sign-up screen has been slightly modified to reflect the name of the project/service StudentPool, a user can now if they already have signed up, navigate to the login screen by clicking on the *Login* link located on the top right of the sign up screen. Or if the user wants to navigate back to the StudentPool website they can also do this by clicking the *StudentPool Website* button which is located on the top right of the screen.



Sign Up

Enter your name: First and Last name e.g. Natl

Select your town: Arklow

Select your educational institution: SETU Carlow

Enter your email address: Email

We'll never share your email with anyone else.

Select if you are a passenger or a driver:

driver

passenger

Submit

Figure 19: StudentPool sign-up screen.

Task 6 (Check email form and generating a map):

This form was originally to find a driver/passenger form, it still does find a driver or a passenger but now this is done by checking the email is that of one that is in the database and once this is successful it will then generate a map of the are of the users town with drivers and/or passengers as a pin with their email details there once the pin is clicked.

Check your email with our database

Enter your email address below:

Email

We'll never share your email with anyone else.

Submit

Figure 20: Check email form

This idea of checking the users email against the database as a means of checking if it exists was scrapped as it just seemed inconvenient as once a user has signed up, they can only access the service if the email and password are correct, a user cannot get past the login screen if an email address and password was not used and does not match that of one in the database.

Python was used to generate the map. Within the HTML code, as it is proving to be a challenge, the coordinates of the towns are hardcoded into the code to generate the map.

This will change to not have to hard code the coordinates of the towns but instead loop through them and retrieve them from the database once the user has done the checking of their email. The coordinates for the town of Carlow were hardcoded into the python file and that file was then called to a HTML file which then displayed the area of Carlow and also included a green pin which when clicked on displayed "driver@itcarlow.ie". This will be changed to display different users and their emails will be displayed on these pins.

```
import folium
carlow = folium.Map(location= [52.8365072, -6.9341359], control_scale=True, tiles='stamenterrain')
folium.Marker([52.8365072, -6.9341359], icon=folium.Icon(color="green", icon="flag"), popup = "Driver@itcarlow.ie").add_to(carlow)
carlow.save(outfile="carlow.html")
```

Figure 21: Python code for town coordinates to generate a map.

Task 7 (User being emailed a randomly generated hashed password):

After a user has signed up to this service, the user will then be emailed a randomly generated password. The user will have to check their email account to access this password and copy the password to their clipboard. For demonstration purposes and as a proof of concept, this email will be sent to C00192937@itcarlow.ie (Nathan Calnan's personal college email).

The user will be sent a random hashed email which will look similar to `1aca4eb6afc6f691847d08a045bc49c7`, this is for security reasons. The user must use this random password right after they sign up as they will be brought to a change password screen.

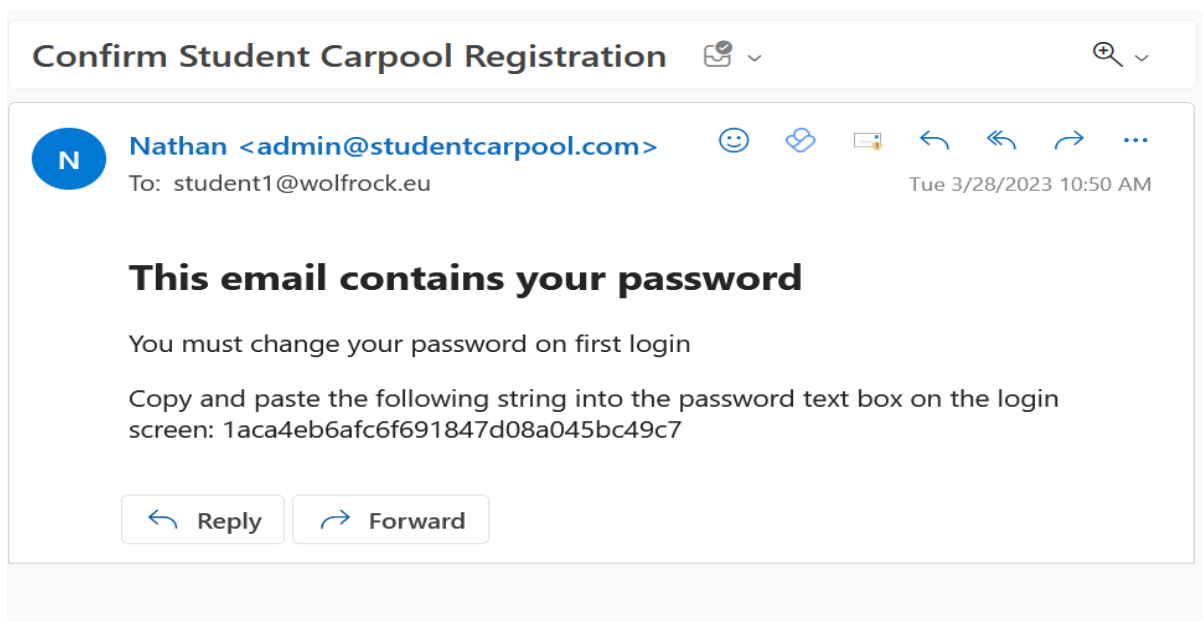


Figure 22: Email containing the random generated password.

Task 8 (Change password screen):

Once a user has signed up this service, the user will be brought straight to a change password screen. The user will have to enter their email address they used to sign up with, to enter their current password which is the randomly generated password, then to enter their new password and then to re-enter their new password.

The screenshot shows a 'Welcome' message at the top of a form. Below the message is the instruction 'Please enter your password details below to change your password'. The form contains four input fields: 'Enter your email', 'Current Password:', 'New Password:', and 'Confirm New Password:'. At the bottom of the form is a button labeled 'Change Password'.

Figure 23: The change password screen.

The idea behind this change password screen is that the user can then change their password to whatever they want as trying to remember a password which is a randomly generated hashed password would be too difficult.

If the user wishes to return to the StudentPool website or if they are already a user and mis-clicked the change password button on the login screen, they can navigate to either of these two by clicking the two buttons on the top right of the screen.

Task 9 (Login screen):

After a user has changed their password, the user will automatically be brought to the login screen. On this screen the user will be prompted to enter their username which is their email address they entered while signing up, and their newly changed password.

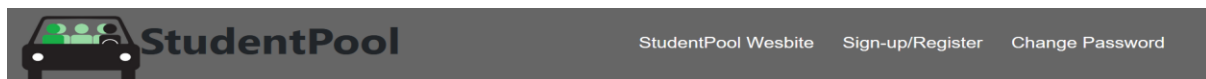
The screenshot shows a 'Welcome' message at the top of a form. Below the message is the instruction 'Please login or register to continue.'. The form has a section titled 'Login' with two input fields: 'Email:' and 'Password:'. At the bottom of the form is a button labeled 'Login'.

Figure 24: The Login screen.

The user also has the options to navigate back to the StudentPool website, to sign up, or to change their password if they click any of the buttons on the top right of the login screen.

If the user enters the wrong details, that is if a user enters an email address and a password that are incorrect the user will not be able to advance to the generating a map screen the fields in which the user entered the details will reset and they will have to enter details again.

Task 10 (Generating a map screen):

Once a user has signed in and all credentials are correct, the user will be brought to a new screen which is a generated map of the area of the town which they specified while signing up. From this the user will see a pin which is either green or red, green specifying that there is another user who is a passenger in that area, and red specifying that there is another user who is a driver in that area. If there are no users in that area that are using this service, then the user will just see a map with no pins.

If a user clicks on one of these pins, then they will see another users email address. It is then up to the user to personally contact the other user via their own personal email.

If a user wants to check another town for, the user has the option to from a dropdown list. The user selects a town from the dropdown list (like the dropdown list when signing up), once the user has selected a town the user clicks the submit button and are then brought to another new screen of the newly generated map of the town.

The user can also navigate to the change password screen, the StudentPool website, or can simply logout from the buttons located on the top right of the screen. If the user clicks the logout button the user will be brought back to the login screen and unable to go back to this screen unless they login again as their session will be terminated.

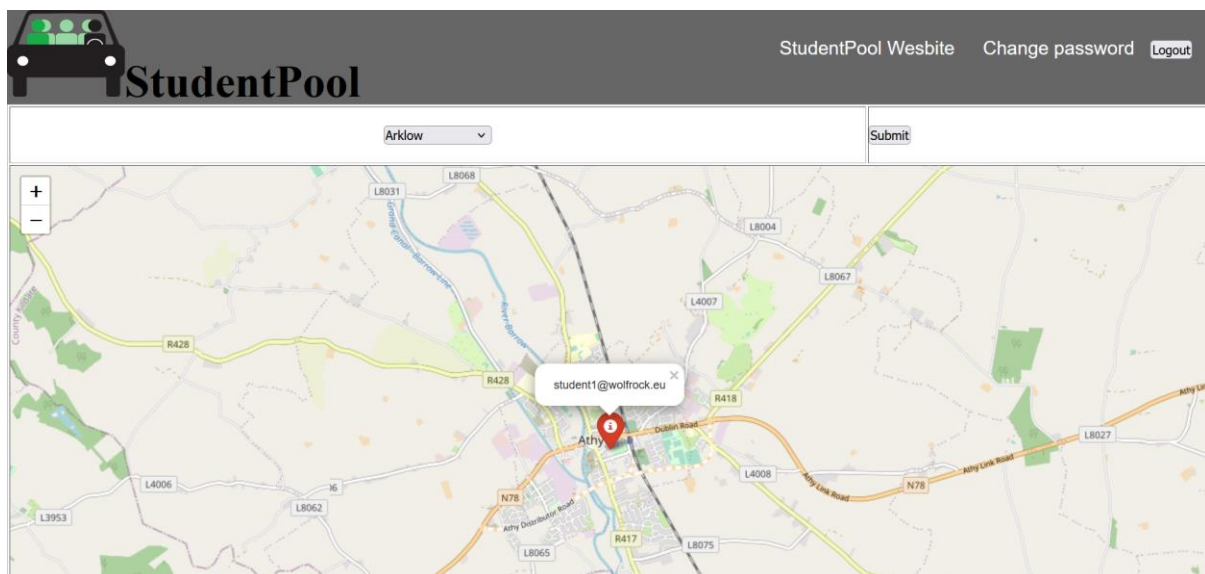


Figure 25: The generated map of a town screen with a pin of driver with the email address student1@wolfrock.eu.

Analysis/Evaluation section

This section evaluates all the technical aspect tasks/requirements and the scoring system for each of the task is as follows:

- 0 – no support
- 1 – minimal support
- 2 – some support
- 3 – satisfactory support
- 4 – comprehensive support

Task 1 (Creating a mock database): This has a scoring of 1 because this task was only in place as a means of creating a mock database that would eventually be deleted just for testing purposes.

Task 2 (Creating a user form): This has a scoring of 1 because this form was eventually discarded, and the new sign-up form was created to replace this form. Although, some of the fields this form has was carried over to the sign-up form.

Task 3 (Find a driver/passenger form): This has a scoring of 0 because this form was completed discarded as the login form done exactly what this form was intended to do but more efficiently.

Task 4 (Setting up the database): This task has a scoring of 4 as a database is the only place to store details for users and also retrieve the users details, without the database none of the forms would work, and no maps could be generated.

Task 5 (Sign up form): This task has a scoring of 4 as the users could access the service once they have signed up and could avail of the carpooling service. If a user signs up and avails of this service, they would be contributing to helping the environment and also reducing their costs of travel.

Task 6 (Check email form): This task has a scoring of 0 as this form was discarded. It was replaced by the simple login form which already checks if the user exists by allowing the user to continue if they're already registered.

Task 7 (User being emailed their hashed password): This task has a scoring of 3 as this task provides the user with their password in a secure manner. The user cannot access the service unless they are given a password.

Task 8 (Change password screen): This task has a scoring of 2 as a user is required to change their password to something they can remember, and they cannot continue unless they do so.

Task 9 (Login screen): This task has a scoring of 4 as a user has to login to avail of the service and generate a map of the town in which they are searching for drivers or searching for passengers.

Task 10 (Generating a map screen): This task has a scoring of 4 as a user must be able to see a map of the town they specify, as this screen enables the user to find potential drivers or find potential passengers.

Summary/Conclusions

StudentPool if used by students can help to significantly reduce the number of privately owned vehicles on the road which in turn will help make the environment more green friendly by reducing the emissions that are produced by these privately owned vehicles. A student can also greatly reduce the cost of commuting to and from their college/university if they avail of StudentPool. In conclusion, this service can have huge benefits on a students life while they attend their third level education, and this service can aid in Ireland's fight to improve the environment.

Future Directions:

Continuing this service for future use, the payment system will be updated to allow users to pay the once time fee after they have signed up. Also, improvements will be made to allow the users to be emailed their random hashed password to their personal email instead of C00192937@itcarlow.ie. More towns and villages will be added to the town list when signing up to expand to more remote rural areas of Ireland. As well as that, the screens will be updated to be more user friendly.

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