COMP2411 Database Systems Term Project Final Report

Topic: Tourism

Group 22

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Part 1: Introduction

1.1 Topic

Tourism

1.2 Development Background

Based on the database system designed by our group, our application is a tourism platform, which provides convenience for both users (intended tourists) and administrators. Through our platform, the tourists can have easy access to the information of attractions, accommodation and food, and make a more reasonable and satisfying travel plan of their own. Also, the administrators can manage the user accounts and decide what information to provide them, and also can have access to some basic statistics of the website's overall usage.

1.3 The technologies of this system

MySQL: To interact with database

ERD: Database structure design

HTML: To set up the web pages

PHP: To connect database and HTML

CSS: To design the layout of the web pages

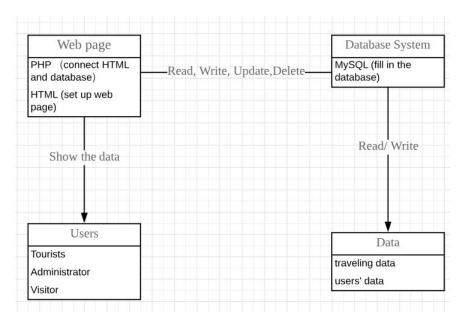
JavaScript: Enable interactive web pages

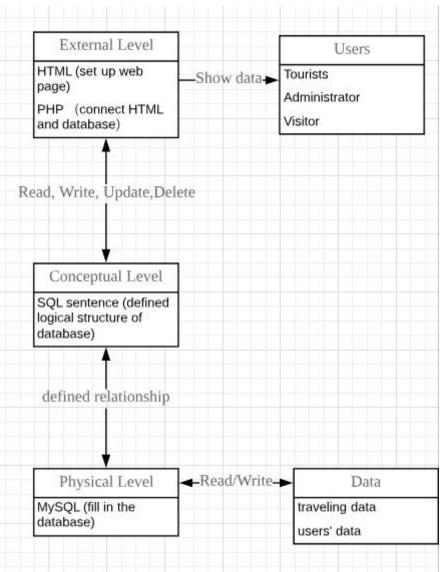
Ajax (belongs to JS): Send and retrieve data asynchronously without interfering with

the display and behavior of the existing page

JQuery (belongs to JS): Display the calendar with retrieved data.

1.4 System Architecture



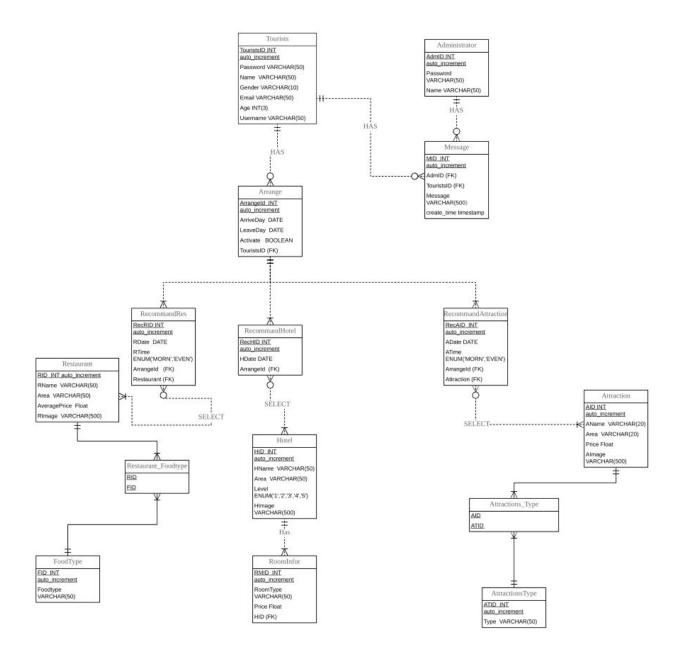


Part 2 Database Design

2.1 Entity Relationship Diagram (ERD)

The following is our ERD design with 15 tables in total.

The name of each table is on the top and all the primary keys are marked with underline.



2.2 Table schemas

BCNF

Tourists (<u>TouristsID</u> INT auto_increment, Password VARCHAR(50), Name VARCHAR(50), Gender VARCHAR(10), Email VARCHAR(50), Age INT(3), Username VARCHAR(50))

Administrator (<u>AdmID</u> INT auto_increment, Password VARCHAR(50), Name VARCHAR(50))

Message (MID INT auto_increment, AdmID*, TouristsID*, Message VARCHAR(500), create_time timestamp)

Arrange (<u>Arrangeld INT auto_increment</u>, ArriveDay DATE, LeaveDay DATE, Activate BOOLEAN, TouristsID*)

RecommandRes (<u>RecRID</u> INT auto_increment, RDate DATE, RTime ENUM('MORN','EVEN'), Arrangeld*, Restaurant*)

Restaurant (<u>RID</u> INT auto_increment, RName VARCHAR(50), Area VARCHAR(50), AveragePrice Float, RImage VARCHAR(500))

Restaurant_Foodtype (RID*, FID*)

FoodType (FID INT auto_increment, Foodtype VARCHAR(50))

RecommandHotel (RecHID INT auto_increment, HDate DATE, Arrangeld*)

Hotel (<u>HID</u> INT auto_increment, HName VARCHAR(50), Area VARCHAR(50), Level ENUM('1','2','3','4','5'), HImage VARCHAR(500))

RoomInfor (<u>RMID</u> INT auto_increment, RoomType VARCHAR(50), Price Float, HID*)

RecommandAttraction (<u>RecAID</u> INT auto_increment, ADate DATE, ATime ENUM('MORN','EVEN'), ArrangeId*, Attraction*)

Attraction (<u>AID</u> INT auto_increment, AName VARCHAR(20), Area VARCHAR(20), Price Float, Almage VARCHAR(500))

Attractions_Type (<u>AID*</u>, <u>ATID*</u>)

AttractionsType (ATID INT auto_increment, Type VARCHAR(50))

(*: foreign key)

2.3 Considerations Made

- Each restaurant possibly contains multiple types of food. In order to avoid deleting anomaly, we separate table restaurant and table food type(both of them have their own primary key), and connect them by another table named Restaurant_Foodtype, then tourists can select restaurant by both restaurant name and food type.
- Each attraction possibly contains multiple types of scenery.
 The solution is similar as above.
- When deleting the data in tables, we need to consider whether attributes as the primary key in this table serves as a foreign key in other tables. Such as, when we are deleting one user as admin, we need firstly delete the Arrange table whose FK is TouristID, since the primary key in Arrange table also serves as FK in other three Recommend tables, we need to delete them first.
- A user may have multiple plans which he/she made before. If we simply delete the plans before, the user can not view the previous plan. So we use the logically deletion. Add an attribute "Activate" to denote if the plan has been done.
- Use surrogate key in the database to simplify the primary key

2.4 Discussion

Rational and trade-off:

Based on BCNF, most of tables contain their own primary key and all attributes in these tables are determined by the primary key.

In order to be normalization and reduce redundancy, we only separate a table into two tables and use another table to connect them.

Part 3: Functional requirement:

3.1 General Functions

1. Welcome Page

• File: index.php

• Elements:

- Navigation bar:

Home -> welcome page

Attraction -> attractions display page

Restaurant -> restaurants display page

Accommodation -> accommodation display page

Plan -> add a new plan page / login page

About -> Developer information page

Login(image) -> tourist login page

- Links:

"Attraction" image card -> attractions display page

"Restaurant" image card -> restaurants display page

"Accommodation" image card -> accommodation display page

2. Registration Page

• File: Registration.php

• Operation:

- Input:

Email, Full Name, Gender, Age, Username, Password (Input password twice to confirm the password)

- Rules:

Two password entered must be the same;

Age and Gender must not be the default option, otherwise the submit button will be invalid;

Length of Username and Full Name must not exceed 16 characters;

The text entered in Email text area must be in email format;

- Output:

(true & false)

If successful, insert the user's information into the database and return the userID to the page for 1 second. Then, jump to the user information page (PersonInfo.php).

Otherwise, it will prompt user to go back to Registration page again

• Implementation: Post tourists' personal information to database sql=insert into Tourists(Email,Password,Gender,Age,Name,Username) values ('\$Email','\$Password','\$Gender',\$Age,'\$Name','\$Username')

3. Search Page

• Search button position:

In the gray bar under the navigation bar in: attraction/restaurant/accommodation pages

- Operation:
 - Input: Keyword the users want to search
 - How the data matched against the input: Use the function "Like" in SQL to match the keyword and Name of Attraction/Hotel/Restaurant
 - Output: The name of Attraction/Hotel/Restaurant and their area and also the picture of it
 - If no result found, output "No result found"

• Implementation:

Use the function LIKE in sql

SQL=select AName, Area, AImage from Attraction join Attractions_Type where Attraction.AID=Attractions_Type.AID AND AName LIKE '%\$Key%'

4. Advanced Search

- File: advancedSearch.php
- Search button position:

In the gray bar under the navigation bar in: attraction/restaurant/accommodation pages

- Operation:
 - Input/parameters:
- 1) Choose the Type(Attraction/Hotel/Restaurant)
- 2) Input the keyword
- 3) Select the Area
- 4) Select the price range
 - Results

The name of Attraction/Hotel/Restaurant and their area and also the picture of it .If no result found,output "No result found".

For the Hotel, the user can also get to know the Room type, because in a Hotel ,there are different Room type, which has different price

• Implementation:

First get the striction the user input from Post, and store them in some arrays, because the users will select multiple areas/price, every time, choose one element in the array and use sql to get the information.

sql=SELECT * FROM Attraction WHERE AName LIKE '%\$sname%' AND ((Price>=\$sprice AND Price<=\$upper) or (Price >=\$sprice1 AND Price <\$upper1) or (Price >=\$sprice3 AND Price <\$upper3) or Price>=\$sprice2) AND Area LIKE '%\$sarea%'

3.2 Function for Tourists:

1. Login Page

- File: Login.php
- Operation:
 - Enter the tourist's ID and corresponding password to jump to personal information page
 - Freely switch between Admin login mode and Tourist login mode
- Implementation: compare the tourists ID and password visitor input with the data in database.

SQL:

select count(*) as count from Tourists where TouristsID = \$TouristsID
and Password = \$Password and Username=\$Username;"

2. Manage account information:

- File: PersonInfo.php
- Operation:
 - Read personal information
 - Edit personal information (Click red button "Edit" next to each item, and input information and finally click "confirm" red button.)
 - Logout the account, linking to welcome page

• Implementation:

Get the user ID from session: \$ID = \$_SESSION['login_tourist']; And get the user information of the corresponding user ID:

UPDATE Tourists SET Username='\$uname' where TouristsID='\$ID'; UPDATE Tourists SET Name='\$fname' where TouristsID='\$ID'; UPDATE Tourists SET Gender='\$gender' where TouristsID='\$ID'; UPDATE Tourists SET Age='\$age' where TouristsID = '\$ID'; UPDATE Tourists SET Email='\$email' where TouristsID = '\$ID';

(Edit: Username, Full name, Gender, Age and tour plans)

3. Receive message

- File: PersonInfo.php
- Operation:
 - Read messages on the Notice Board
- Implementation:
 - First get the restriction the user input from Post, and update corresponding database.

eg. for edition of username

\$uname = \$ POST['unameInput'];

\$result = mysqli_query(\$link, "UPDATE Tourists SET
Username='\$uname' where TouristsID ='\$ID'");

 As for reading news, first exact message from database \$sql=" select * from Message WHERE TouristsID = \$ID ORDER BY creat time";

Then, print the corresponding messages on the Notice Board. Due to the number of messages is not fixed, we use while statement to ensure all the messages are extracted.

4. Making travel plan:

- File: insertatr.php, insertres.php, insertacc.php
- Operation:
 - 1)User choose the attraction/restaurant/hotel they like
 - 2)User choose the date and time based on their arrange
 - 3)The backend php insert the choices of the user into corresponding table
 - 4) View the plan (SEE POINT 5)
- Implementation:

1)Show the available choices to users: store the sql result in an array and make each element as available options

```
(echo"<option value='$name[$i]'>--$name[$i]--</option>")
```

- 2)Get the choices of user from the array Post
- 3)Insert into table:

*Get the ArrangeID which belongs to the user and is also activate (A user may have many plans but only one can be activated)
\$sql="SELECT ArrangeId FROM Arrange WHERE TouristsID = '\$USERID' and Activate=0"

*Insert the data

\$sql=INSERT INTO RecommandAttraction (Date, Time, ArrangeId, AID) VALUES('\$day','\$time',\$arrangeid,\$aid)

5. View the travel plan:

- File: addNewPlan.php, plan.php
- Operation:
 - 1) Add a new plan (addNewPlan.php)
 - Input: the arrival date and departure date of their travel plan by selecting the date from the calendar or typing by keyboard.
 - Rule:

Show "success" if selected both dates;

Show unsuccess page that prompting input error and return to the original page if lacking date input.

2) View the plan (plan.php, enter by sidebar)

Tourists can view their customized plan with selected events in "plan schedule" in a calendar form by month, week, day and list.

• Implementation:

1)Add the dates to their arrange:

UPDATE Arrange SET ArriveDay=\$arriveday,LeaveDay=\$leaveday where TouristsID=\$id

2) View the plan:

- Select all the events that users add in to their plan from three tables in database:

\$sql1="SELECT AName, ADate, ATime

FROM RecommandAttraction as RA, Arrange as AR, Attraction as A

WHERE AR.arrangeId = RA.arrangeId AND A.AID = RA.AID AND AR.touristsId = \$USERID;";

\$sql2 is selecting restaurant, which is similar to \$sql1.

RH.HID AND AR.touristsId = \$USERID;";

\$sql3 = "SELECT HName, HDate FROM RecommandHotel as RH, Arrange as AR, Hotel as H WHERE AR.arrangeId = RH.arrangeId AND H.HID =

- Put the query result in JQuery functions and display in the calendar.

3.3 Function for Administrators:

1. Login Page:

- File: Login.php
- Operation:
 - Enter the administrator's ID and corresponding password to jump to administration page
 - Freely switch between Admin login mode and Tourist login mode
 - Admin account is pre-assigned in advance
 - (ID:6 Password: 00000006;
 - ID:7 Password:00000007;
 - ID:8 Password:00000008;
 - ID:9 Password:00000009)
- Implementation:compare the administrator ID and password visitor input with that in database. if correct, login successfully.

SQL: select count(*) as count from Administrator where AdmID = \$AdmID and Password = \$Password;

2. Search and manage user:

- File: deleteuser_form.php; delete_user.php edituser form.php; edit user.php
- Operation:

User information is displayed on the interface

Choose delete / edit / deactivate

- delete: Input the id to delete the user
- edit: Input the id and information you would like to revise
- deactivate: set active/non-active of the users
- Implementation:
- 1. delete
- 1) Since TouristsID serves as many foreign key in other tables, we need to delete the tables who contains it as FK firstly.
- 2) \$se1="SELECT * FROM RecommandRes WHERE ArrangeId = '\$ArrangeId' ";
- 3) use if(mysqli_affected_rows(\$link)>0) to check whether this table contains TouristsID (for every TouristsID has at least one ArrangeId) if so, delete it. "DELETE FROM RecommandAttraction WHERE ArrangeId = ' \$ArrangeId"
- 4) after going through RecommandRes, RecommandHotel, RecommandAttraction,

Arrange: "DELETE FROM Arrange WHERE TouristsID='\$TouristsID'"

- 5) Message: "DELETE FROM Message WHERE TouristsID='\$TouristsID"".
- 6) Tourists itself: "DELETE FROM Tourists WHERE TouristsID = '\$TouristsID'".
- 2. Edit
- 1) "UPDATE Tourists SET Username='\$Username', Age='\$Age', Gender =

- '\$Gender', Email= '\$Email' WHERE TouristsID='\$TouristsID'"
- 2) use "mysqli affected rows(\$link)==0" to check whether there finds a record;
- 3. Deactivate: If the leave day in plan is before the current date then set the plan as non-activate.
- sql=update Arrange SET Activate=1 WHERe Arrange.LeaveDay<\$date

3. Manage data: CRUD:

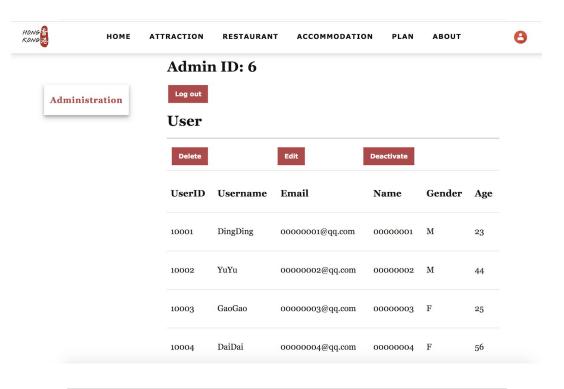
- File: addattr_form.php; add_attr.php; addres_form.php; add_res.php; addhotel_form.php; add_hotel.php; editattr_form.php; edit_attr.php; editres_form.php; edit_res.php; edithotel_form.php; edit_hotel.php; deleteattr_form.php; delete_attr.php; deleteres_form.php; delete res.php; delete hotel.php;
- Operation:
 - 1. You could first choose the bottom under Attraction, Hotel and Restaurant
 - 2. Add new data to database by filling in the a form
 - 3. Edit the existing data by filling in the a form
 - 4. Physically delete data by enter the ID
 - 5. View all the data by enter the keyword ("Search for data" bottom)
 - 1) choose a type you would like to see the data
 - 2) enter the keyword of the name to search
- Implementation:
- 1. Add
- 1) "insert into Attraction (AName, Area, Price) values ('\$AName', '\$Area', '\$Price')";
- 2) use \$AID = mysqli_insert_id(\$link) to store the autoID;
- 3) get the Attraction type id from another table using "select ATID from AttractionsType where Type='\$Type' ";
- 4) "insert into Attractions Type (AID, ATID) values ('\$AID', '\$ATID')";
- 2. Edit
- 1) "UPDATE Attraction SET AName='\$AName', Area='\$Area', Price='\$Price' WHERE AID='\$AID'"
- 2) use "mysqli_affected_rows(\$link)==0" to check whether there finds a record;
- 3) use similar procedures to updated data in several tables.
- 3. Delete
- 1) "DELETE FROM Attractions_Type WHERE AID='\$AID'" delete physically from the table where AID is a foreign key first.
- 2) use "mysqli affected rows(\$link)==0" to check whether there finds a record;
- 3) if so, "DELETE FROM Attraction WHERE AID='\$AID'" delete physically from the table where AID is a primary key.
- 4. Search the information by using keyword
- 1) "SELECT * FROM Hotel WHERE HName LIKE '%\$name%'" and use "mysql_affected_rows(\$link)==0" to check whether there finds a record;
- 2) use while(\$row = mysql_fetch_array(\$result)) to print the data in multiple tables whose procedure is similar to the add function.
- 3) we need to consider the condition that one hotel have multiple room types, we could use \$count to record, if have more than 1 set, make the information

in front of them blank.

ID	name	area	level	roomtypeID	roomType	price
1	Tai Hing Hotel	Mong Kok	2			
				1	Single room	225.5
2	Mirador Hotel	Tsim Sha Tsui	2			
				2	Single room	400
3	Palazzo Holiday Hotel	Causeway Bay	2			
				3	Double room	265
4	Regal Oriental Hotel	Hung Hom	3			
				4	Single room	600
5	Harbour Plaza Metropolis	Hung Hom	4			
				5	Single room	700
6	Bridal Tea House Hotel	Homantin	3			
				6	Double room	450
9	Iclub Sheung Wan Hotel	Victoria Peak	3			
				9	Double room	1000.55
10	Rosedale Hotel	Causeway Bay	3			
				10	Single room	800.54
				13	Double room	850.99

4. Summary of information:

- File: Admin.php
- Operation:
 - Login as Administer and then he/she can view the data
 - 1)All the users
 - 2) Number of active users
 - 3)3 most active users
 - 4)Hot attraction/Hot hotel/Hot restaurant
- Implementation:
 - 1)SELECT count(DISTINCT TouristsID)as User FROM Tourists
 - 2)SELECT count(DISTINCT TouristsID)as AUser FROM Arrange where Activate=0
 - 3)SELECT Arrange.TouristsID as I,Username,count(ArrangeID) as c FROM Arrange join Tourists WHERE Arrange. TouristsID = Tourists. TouristsID GROUP BY Arrange.TouristsID order by c limit 3



Summary

Total No of Users:

6

No of Users Currently in HK:

 ϵ

No of Users with Plans:

10001	Dashan	Times: 1
10005	QinQin	Times: 1
10002	YuYu	Times: 1

Hot choices:

Attraction: Disnyland Hotel: Tai Hing Hotel

Restaurant: Disney Restaurant

• Logout

Part 4: Non-functional requirement:

4.1 Basic security issue:

For tourists:

- Register:
- 1) Ask tourists to input their password twice in case tourists have some spelling mistake;
- 2) The user should input the correct format of email;
- 3) The user cannot leave the text areas blank, otherwise they will not be able to submit the information;
- Login: only tourists with corresponding tourists ID and password can login
- Account Information: The user will not be able to get access to the Account Information page using url without logging in, and in that condition the page will automatically jump to login page.

For administrator:

- Login: only administrator with corresponding administrator ID and password can login and manage data
- Personal information of tourists: administrator can not view tourists password
- Administration: The user will not be able to get access to the Administration page using url without logging in, and in that condition the page will automatically jump to login page.

4.2 Website layout and design and Simple User Manual









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 Navigation bar (topnav.php/topnav)Home -> welcome page Attraction -> attractions display page Restaurant -> restaurants display page Accommodation -> accomodation display page Plan -> add a new plan page / login page About -> Developer information page Login(image) -> tourist/admin login page

- Search bar (topbaratt.php/topbarres.php/topbaracc.php)
 Search by keyword entering -> results display page
 Advanced search -> advanced search page
- Side bar: Refine/filter the item displaying
- main body
- footer indicating copyright (footer.php)

4.3 Usability and feasibility

Database system:

Usability:

- This database system can apply to various kinds of SQL and Oracle system
- Update data is convenient in SQL and Oracle system

Feasibility:

• In case of anomaly, this is an BCNF database system. So each table relatively independent. Update data is safety.

Web page:

Usability:

- Using HTML, PHP and CSS to set up the web pages is convenient to apply to other similar web page.
- PHP in this system can connect the data and web page from SQL and Oracle system.

Feasibility:

• Each web page is relatively independent, so it is safe to update web page.

Part 5: Future development:

- Provide more type of choice, like ticket.
- Book restaurant, ticket or hotel online.
- Recommend the most famous attraction, restaurant and accommodation.
- Provide comment zone.
- Discussion zone for tourists to publish their traveling dairy.

Part 6: Reference:

1. https://fullcalendar.io/

Appendix:

Attachment: ERD diagram; source code; database script

Appendix Part 1: Simple User Manual

• Chrome is recommended to open web pages

Step 1: Open Explore HK Welcome page:







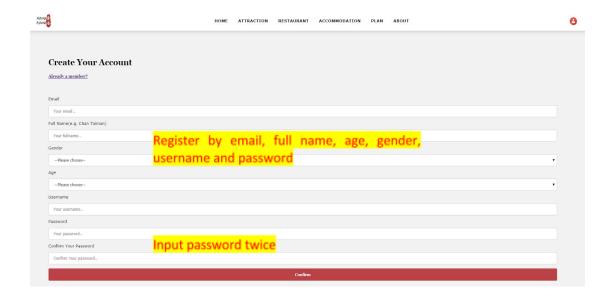


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As for visitor: Jump to Step 6 As for new user: go to Step 2 As for user: go to Step 3

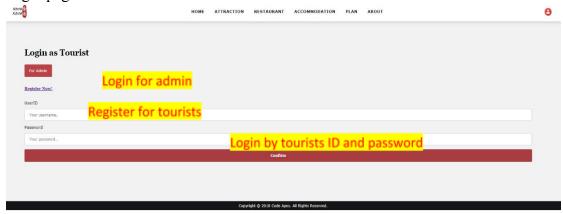
As for administrator: juup to Step 11

Step 2: Register for tourists



Step 3: Login for tourists

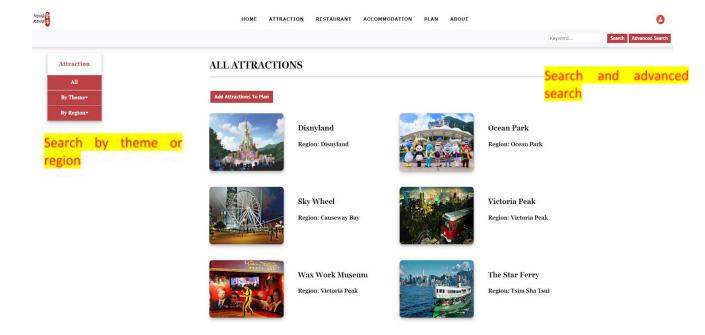
Login page for tourists:



Step 4: check tourists personal information and read message

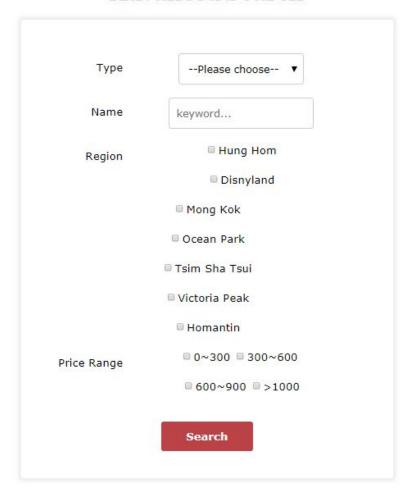
HONG KONG	HOME ATTRACT	ON RESTAURANT ACCOMMODATION PLAN ABOUT	6
Personal Account		Account Information	
Personal Information	User ID:	10001	
Read News	Username:	DingDing	Edit
	Email:	00000001@qq.com	Edit
	Full name:	00000001	Edit
	Gender:	М	Edit
	Age:	23	Edit
	My Plan	(Click here to view and edit)	
		Log out	
click "Read News"	to see message:	Log out	
		Log out	
-		Notice Board	
You have successfully	added to your plan. ON 2018	:-12-05 17:09:58	
Step 5: edit tourists	personal information a	and click "confirm" to save	
Username:	DingDing		Confirm

Step 6: viewing all attraction, hotel and restaurant or search by keyword and advanced search

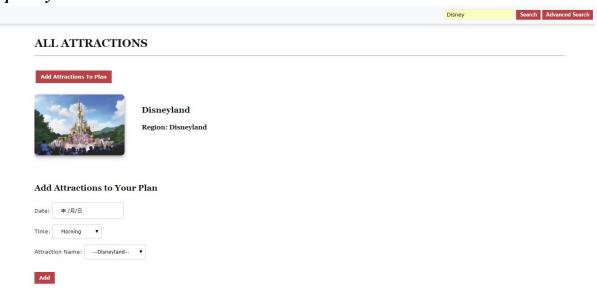


Click "Advanced Search" at right top corner:

Advanced Search



input keyword in search bar and click "search":

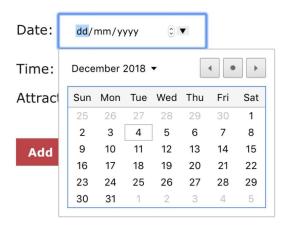


Step 7: Add attraction, hotel and restaurant to your plan: visitor can not add to plan

Add Attractions to Your Plan

Date: dd/mm/yyyy			
Time: Morning \$	input from c	select ndar	date
Attraction Name:Disnyland			
Add			

Add Attractions to Your Plan



Add Attractions to Your Plan

Date:	01/02/2019	
Time: (Afternoon \$	
Attracti	ion Name:Disnyland	
Add		

Add Attractions to Your Plan



Add Attractions to Your Plan

Date: dd/mm/yy	уу
Time: Afternoon \$	
Attraction Name	✓Disnyland
Add	Ocean ParkSky WheelVictoria PeakWax Work MuseumThe Star FerryLangham PlaceHong Kong PolyuVictoria Harbour

Step 8: View your plan: click "PLAN" button click "Add New Plan" select arrival and departure date to set up a new plan





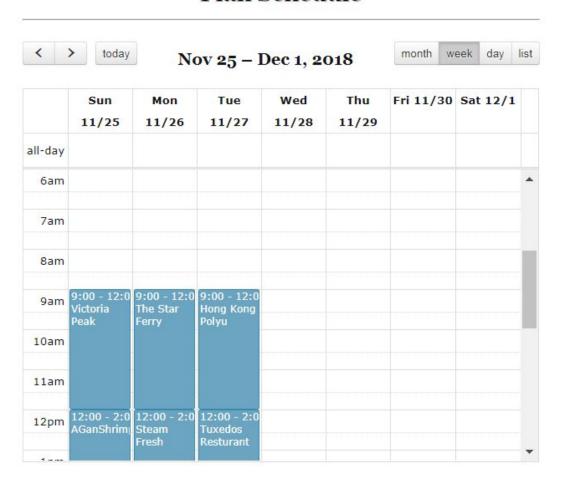
Click "My Plan" to show your plan: By month:

| None |

Plan Schedule

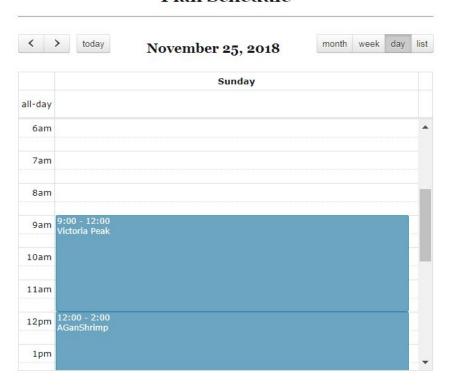
By week:

Plan Schedule



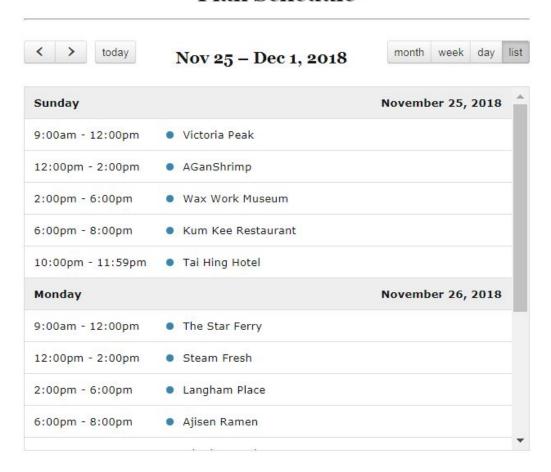
By day:

Plan Schedule

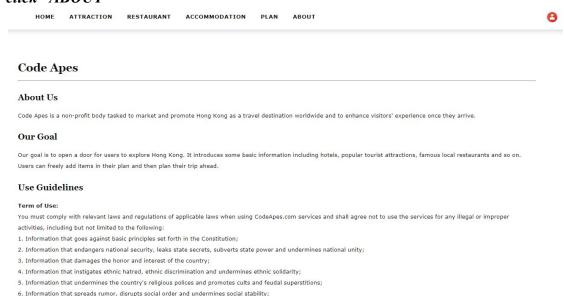


By list:

Plan Schedule



Step 9: view introduction of company click "ABOUT"



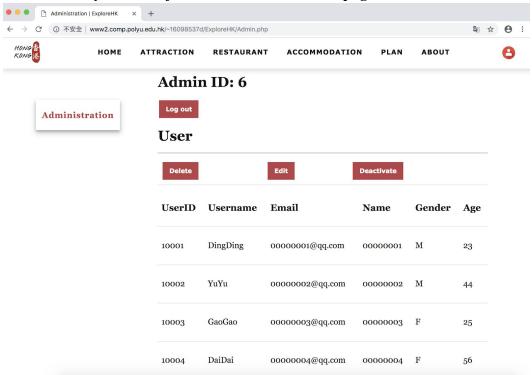
Step 10: logout

Log out

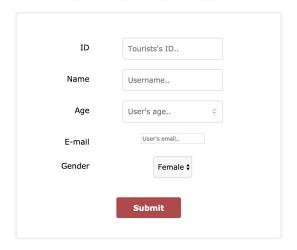
Step 11:Login for administrator:



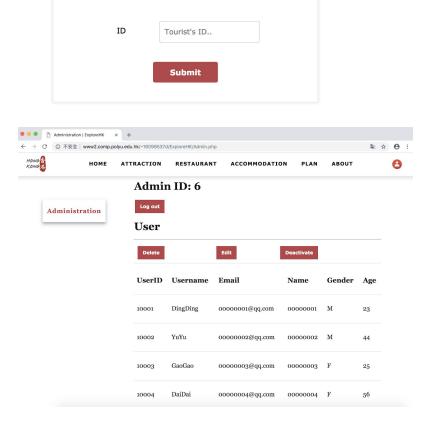
Show summary, users' information and data in this page:

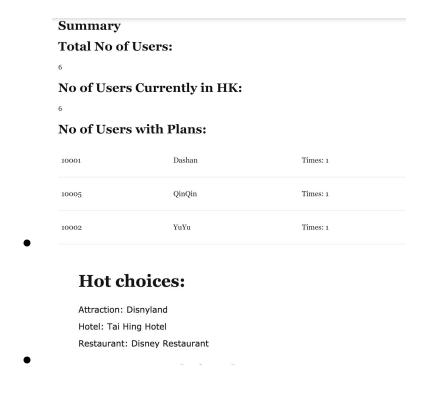


Edit User Information

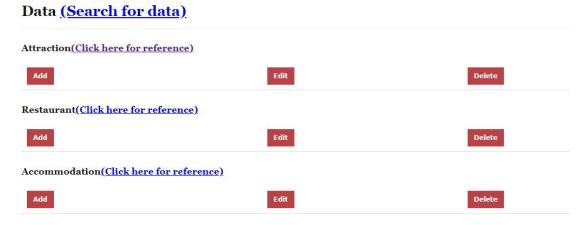


Delete user information



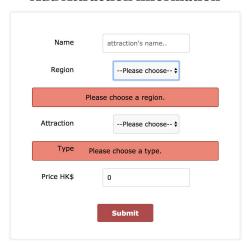


Admin manage other data:



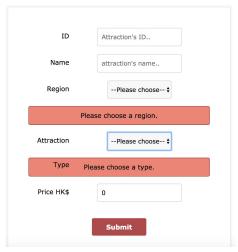
Add data:

Add Attraction information



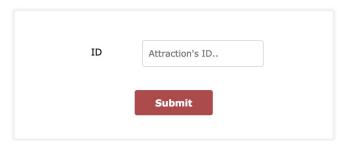
Edit data:

edit Attraction information



Delete data:

delete Attraction information



Appendix Part 2: Contribution of Team members

17082316d	Ding Dashan	Team Leader + frontend html + backend php
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16098537d	Yu Jing	frontend html + backend php
17081973d	Dai Yimin	backend php + database design
17083686d	Xia Jialu	backend php + database design
17081996d	Gao Haorui	backend php + database design
17082705d	Qin Yaxue	frontend html + backend php

Appendix Part 3: Checklist

- Support tourists and administrator to login
- Support tourists to register
- Search by keyword
- Advanced search by selecting parameters
- Sort out the data after searching
- After tourists login:

read/edit/update their personal information read message and news read and search travel plan history view travel plan Search the data and add them to his plan

• After administrator login:

Edit/delete/update tourists account Summary information of tourists and other data Add/edit/insert/delete data

Appendix Part 4: URL

http://www2.comp.polyu.edu.hk/~16098537d/ExploreHK/

Appendix Part 5: Installation guide

- 1. Open Google Chrome Browser
- 2. Run following link (install.php) to install all tables in our database: (username: 16098537d, password: "iqdobdiy")

http://www2.comp.polyu.edu.hk/~16098537d/ExploreHK/php/install.php

3. Open the welcome page:

http://www2.comp.polyu.edu.hk/~16098537d/ExploreHK/