

COMP9900 Project Report

Course Name: Computer Science Project/Information Technology
Project

Project Title: Event Management System/EventBooker

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1. Overview

1.1 Background and Project Positioning

Today, attending a wide variety of events has become an integral part of people's lives, socializing, and entertainment. Some companies, teams (or individuals) want to organize events, while others (usually individuals or groups) want to find a platform where they can easily access information about these events and can book tickets to attend them. Our project was created for this need. We are a website named EventBooker that offers three main services:

- Provide a concise browsing and querying function (there may be a recommendation system in the future) of event information, and match events and potential participants as optimally as possible.
- Customers can better manage their bookings (or the events they follow), helping them to better track event information.
- Organizers can better manage the events they create, communicate with potential participants, and provide after-sales service.

Thus, our project is positioned to be an event ticketing website that commercially acts as a middleman role, matching organizer groups and participant groups, and facilitating them to manage their events/tickets.

1.2 Software Architecture

The software architecture we applied in this project is shown below in *Fig 1*. We used the three-tier architecture which is the presentation layer, business layer, and data layer. We will demonstrate our software architecture from the bottom layer to the top layer.

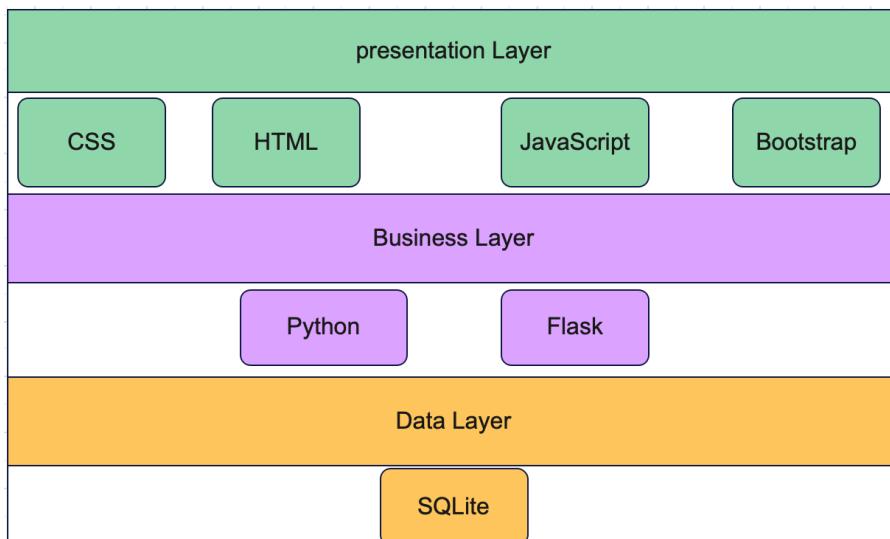


Fig 1. Software Architecture

1.2.1 Data Layer

First, we will talk about the Data Layer. We keep the data that needs to be stored very light. For example, instead of consuming $O(nm)$ space to store the seat information in the database, we use only $O(1)$ to store other information which can result in the same effect as consuming $O(nm)$ space which will be talked about in more detail in the Challenges sections. With these improvements, when we design the schemes of our database. We haven't practiced any fancy technologies, for instance, clouding. Because light database engines like SQLite are enough for our data storing and management. Every time when a piece of data needed to be stored(verified by the Presentation Layer) has been constructed, the Business Layer will send it to the Data Layer and store the data. On the other hand, the business layer only retrieves data from data at the beginning of a new page or data that concerns this page has been changed.

1.2.2 Business Layer

In the Business Layer, *Flask* will construct our WSGI application which will forward requests and other interactions with the web server. We changed some configurations of it mainly for features like password protection and email sending. Then, the `route()` decorator will tell *Flask* what URL will trigger the function we wrote. We prepare the data needed in the frontend in these functions. Another decorator `teardown_appcontext()` is used to safely disconnect from the database.

1.2.2 Presentation Layer

As for the presentation layer, Bootstrap is used for the CSS framework to make the frontend pretty and responsive. The skeleton of the frontend is kept in HTML which is stored in the template folder and will be rendered by Flask with a certain URL. And the self-defined style is written in inline style CSS inside HTML. The dynamics of the presentation layer are achieved by JavaScript. Intermediate data which are not yet verified to the database is managed here. Data generated in the presentation which are verified will be sent to the backend for further interactions with the data layer.

2. Functionalities

This section reports on the functionality of the project and the challenges encountered in its implementation. In the final report, in order to reflect the UserStory of the full process of the project, we merged the boards in the proposal into the USE CASE model (a common model in software engineering). It is divided into 4 sections as shown in *Fig 2* with its corresponding color :

- 1. Authentication (pre-registration/registration/login),
- 2. Common Function (framework functions: viewing, searching, communicating),
- 3. As a Host (host-specific function group),
- 4. As a User (User-specific function group).

By doing so, we will be divided into the functions of the site "who can do what at what time", these sections are relatively independent and pyramidal, which will be of great help to the subsequent expansion of the function of the development, we can only modify a certain function module to complete the upgrade, avoiding a large number of functions associated. The following screenshots show a breakdown of the functions in our proposal (unchanged from the submitted proposal) which is shown in *Fig 3* that may be relocated in different Role-based-Stories. You can quickly locate each function by color.

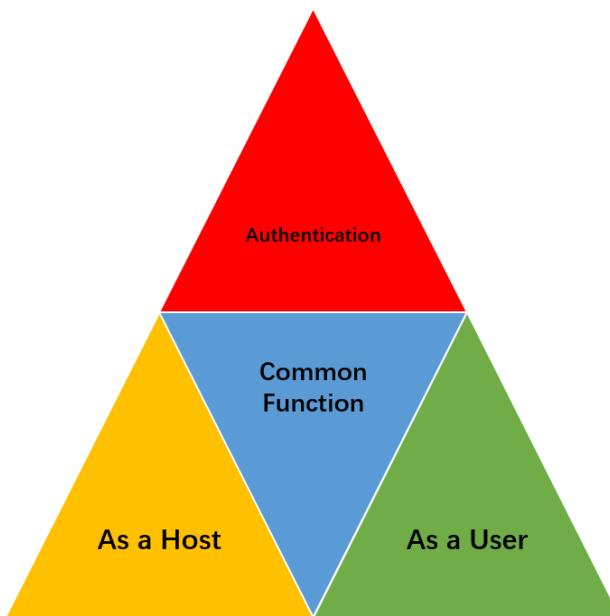


Fig 2. Functional group structure diagram

(Red: Authentication; Blue: Common Function; Yellow: As a Host; Green: As a User).

There are mainly 6 general objectives for this project, authentication, event posting, event viewing, pre-event communication, ticket booking, and post-event communication. All of these objectives have user stories respectively, which are discussed in detail below.[←]

Furthermore, there are two more functions, which are the novel ones, explained with user stories after the 6 general objectives.[←]

←

I. Authentication:[←]

1. Host register and login authentication can be satisfied by the first story and the second story respectively. E.g., “As a host, I want to register an account using the username and password credentials, and the events I own are connected with this account” and “As a host, I want to log in to my account with username and password credentials so that I have access to my account”.[←]
2. Prospective customer authentication can be achieved by the third story, “As a prospective customer, I want to register an account so that I am authorized to do more actions than just viewing events on this website”. Firstly, a customer can register a new account, which can be used to login in later.[←]

II. Event posting:[←]

1. Event posting by hosts can be satisfied by the 4th story, “As a host, I want to post a new event on this website with the information I provided, so it is viewable and purchasable”. Here, the “information I provided” includes the event title, description, type, venue, event start/end date/time, number of tickets available, ticket price, etc.[←]

III. Event viewing:[←]

1. To view a list of events coming up in the next months whose tickets have not been sold out, the prospective customers can use the 5th story, “As a prospective customer, I want to view a list of events coming up in the next month whose tickets have not been sold out so that I can find more details”. One thing to note is that the customers are able to know whether the tickets are sold out or not.[←]
2. Customers can search for events by the title, description, and/or type, which is achieved by the 6th story, “As a customer, I want to search for events by certain parameters so that I can find the events more efficiently”. To be more specific, the “certain parameters” above represent the title, description, and/or type.[←]

IV. Pre-Event communication:[←]

1. Hosts can broadcast a message to all customers who have booked tickets to a given event (e.g., via email). And this can be reflected in the 7th story, “As a host, I want to broadcast a message to all customers that have booked tickets to a given event via email, so that they can have an alternative way to access the tickets they have bought”.[←]
2. Hosts are able to cancel an event not started and they can send a cancellation message to all customers with a booking. Besides, all customers with a booking will get a refund. This objective can be satisfied by the 8th story, “As a host, I want to cancel an event that has not started, and a cancellation message will be broadcast to all customers who have booked tickets to this event and they will get a refund”. One important point is that the messages will be sent to the related customers via email.[←]

V. Ticket booking:

1. A registered customer is able to book a ticket to a listed event. Moreover, they are able to select an available seat as well. This objective is reflected in the 9th story, “As a customer, I want to book tickets with the desired seats for my desired events”. One point to note is that the “desired events” should be one of the listed events. And another important thing is that the “customer” above should be a registered customer.
2. A registered customer can cancel their booking if the event is scheduled to occur at least 7 days into the future. Besides, the customer can get a refund for this booking and this ticket will be freed up for other people. This objective can be achieved by the 10th story, “As a customer, I want to cancel the ticket I have bought for an event if its scheduled date is less than 7 days from now on so that I can get a refund of this ticket and the others are able to buy it”. It is necessary that the “scheduled date is less than 7 days from now on”.

VI. Post-Event communication:

1. Customers can leave a review for the event that they have attended (one review per customer). And this can be satisfied by the 11th story, “As a customer, I want to leave a review for the event I have attended so that other customers can take it into consideration when they are struggling on buying the tickets for this event”.
2. Hosts are able to reply to reviews that have been left by customers for their events, which can be achieved by the 12th story, “As a host, I want to reply to reviews left by customers so that good customer services are provided”.
3. Customers and prospective customers are able to read reviews together with host replies to the reviews for all events. This objective can be satisfied by the 13th story, “As a customer or a prospective customer, I want to read the reviews left by customers and the replies left by hosts, so that I can have other perspectives of these events”.

2.5 Novel Functionality and Elaboration**I. Novel Function 1:**

- A. Functional Role: Potential Participant
- B. Function content: bookmark/follow the organizer, get remaining votes displayed (via Email), get updated event information (via Email)
- C. Scenario description: Some potential participants may find certain sponsors (or events) very attractive, and they hope to pay attention to these events for a long time and get reminded when the next event is held or promoted. Some activities may not have tickets for the time being, but potential participants are eager to participate, so they pay attention to the activities. Once there are remaining tickets or updated information for the event, they can be reminded as soon as possible.
- D. Compared with the existing system: Ticketmaster and Eventbrite systems have the function of favoriting/following the organizer, but they cannot provide more functions such as remaining tickets. In fact, their attention function is just a reminder of some active time.

↳

II. Novel Function 2:

- A. Functional role: event organizer
- B. Functional content: Under the premise of giving the reason, adjust the price of the ticket; display the activity information of the promotion type in the promotion area
- C. Scenario description: Some events may be held soon but there are still remaining tickets or the organizer wants to launch promotional activities for other reasons. At this time, the system will ask the organizer to give the reason (description) and adjust the price. The system will display the event in the promotion area to help the organizer sell faster.
- D. Compared with the existing system: Ticketmaster and Eventbrite systems do not have this function.

Fig 3. Screenshots show a breakdown of the functions in our proposal

2.1 Authentication

Story stream: I just came across a new website that seems to showcase a lot of interesting events, and I'd like to either peruse the event details, and buy tickets, or my band friends would like to host their own concerts there.

User story:

{As a host, I want to register an account using username and password credentials so that the events I own are bound with this account.}

{As a host, I want to log in to my account with username and password credentials so that I have access to my account.}

{As a prospective customer, I want to register an account so that I am authorized to do other actions other than viewing events on this website.}

2.1.1 Backstory

As an event booking website/app, we want to get a steady flow of customers to maintain revenue. For our customers (including potential event ticket buyers and potential event organizers/teams), having their own personal account on the website to manage event organizing/ticketing information is also a common demand on the current internet.

2.1.2 Clear workflow explanations and functional screenshots

a. If the customer is not logged in, the search function, event comment function, ticket buying function, and create event function will be limited and customers will be reminded to register or log in. The home page should have the registration and login buttons prominently displayed.

The image contains two screenshots of the EventBooker website. The top screenshot shows the homepage with a red box around the 'Login Register' button in the top left. Below it, a red box highlights a message: '... Please Login or Register to view more upcoming events! ...'. The middle section is titled 'Upcoming Events' with three event cards. The first card for 'Miss Fiona' has a red box around its 'Detail' button. The second card for 'RLQ' also has a red box around its 'Detail' button. The third card for 'RLOYD'S' has a red box around its 'Detail' button. To the right of these cards, the text 'can't buy' is written in red. The bottom screenshot shows a zoomed-in view of an event page for 'Miss Fiona'. A red box highlights a 'Reminder' message: 'Please login or register an account for further actions.' Below this, a red box highlights the 'Buy' button, which is disabled and grayed out. To the right of the button, the text 'CAN NOT BUY' is written in red. At the bottom of the page, a red box highlights a comment input field containing 'HIS' and a 'Submit' button, with the text 'CAN NOT COMMENT' written in red to its right.

- b. When a customer clicks on the registration page, they will be redirected to this function.

Customers should be able to register with their own email and ID. The email address and ID must be unique. And we remind users to set non-simple passwords, we require users' passwords to be at least 8 digits in length and contain both letters and numbers. We also check the completeness of the Email address format. Customers are required to enter their password a second time to confirm. Clients need to choose whether they are hosts or users when registering.

The figure consists of three side-by-side screenshots of a web-based registration form. Each screenshot shows a header with 'Username' (containing 'Qinstin'), 'Email address' (containing 'Qinstin@'), 'Password' (containing '*****'), and 'Retype Password' (containing '*****'). Below these are radio buttons for 'User' and 'Host'. A red box highlights the 'Email address' field in the middle screenshot, which contains 'Qinstin@'. A yellow warning icon with the text 'Please enter a part following "@".' and 'Qinstin@' is incomplete is shown above the field. The bottom of each screenshot has a blue 'Register' button. The footer of each screenshot displays the text '©2023-2024'.

- c. When a customer completes registration, our database stores the customer's personal information, but the customer's password is encrypted in the database.

	id	email	password	name	picture
		Filter	Filter	Filter	Filter
1	1	aaa@gmail.com	sha256\$lcygxb2\$658229151ecb820a02ab7822dda30f3...	aaa	NULL
2	2	ann@gmail.com	sha256\$J5M0g7hP\$fd3be4472216d9a9756cd6a6decf93...	Ann	NULL
3	3	a@gmail.com	sha256\$XCaRw82U\$e42dfc7d911192307913a55f5905a7c...	aa	NULL
4	4	123@gmail.com	sha256\$L5Xhojal\$034e679b7305a40adf044994919ab08...	123	NULL
5	5	b@gmail.com	sha256\$5kmVrs6o\$59d87e8914a892c0a943acd9db549...	b	NULL
6	6	z@qq.com	sha256\$OluaWzchCT8qZhiU\$9cc1c7238a1b24826db5b...	zena	NULL
7	7	a@qq.com	sha256\$HcS3oDSjwMiuu6XJ\$0fd9b232701ded1a8d48a6...	aaaaa	NULL
8	8	billionanna@gmail.com	sha256\$f0lo0QI7fL5fCuMb\$5f13a441c36a86884b1952f1...	Yuqi	NULL

- d. Users will be able to log in with their own accounts and passwords. The information entered by the customer when logging in will be verified in the database to be in the correct combination. When the customer enters the correct password to log in, subsequent logout operations can be performed.

The figure consists of two screenshots. The left screenshot shows a 'Login' form with 'Email address' and 'Password' fields. A red box highlights the 'Password' field, which contains '*****'. Below the fields is a pink box with the text 'The password is NOT correct. Please try again.'. At the bottom is a blue 'Login' button. The footer says '©2023-2024'. The right screenshot shows a 'EventBooker' interface with a 'Logout' button. It features a search bar and a section titled 'Upcoming Events' with the sub-instruction 'All available events in next month.' Three event cards are displayed, each showing a photo of a dog, the event name (FinalEvent 61, FinalEvent 190, FinalEvent 88), the host ('QAZ'), start and end dates, and location ('Kensington').

2.2 Common Function

Story stream: I signed up for my account so I could browse more information. I went to search for future events that will be held in my city, and I saw a cool event, but I was a little hesitant to attend. I noticed that below the details of the event, I could see that people were asking some questions about the upcoming event, and I wanted to leave a comment to the

organizer to ask if the event was as fun as I thought it would be!

User story:

{As a prospective customer, I want to view a list of events coming up in the next month that have not sold out so that I can click for details.}

{As a customer, I want to search for events by certain parameters so that I can find the event more efficiently.}

{As a customer, I want to leave a review for the event, so that other customers can take it into consideration when they are struggling on buying the tickets for this event. }

{As a customer or a prospective customer, I want to read the reviews left by customers and the replies left by hosts, so that I can have other perspectives of these events.}

{As a host, I want to reply to reviews left by customers so that good customer services are provided.}

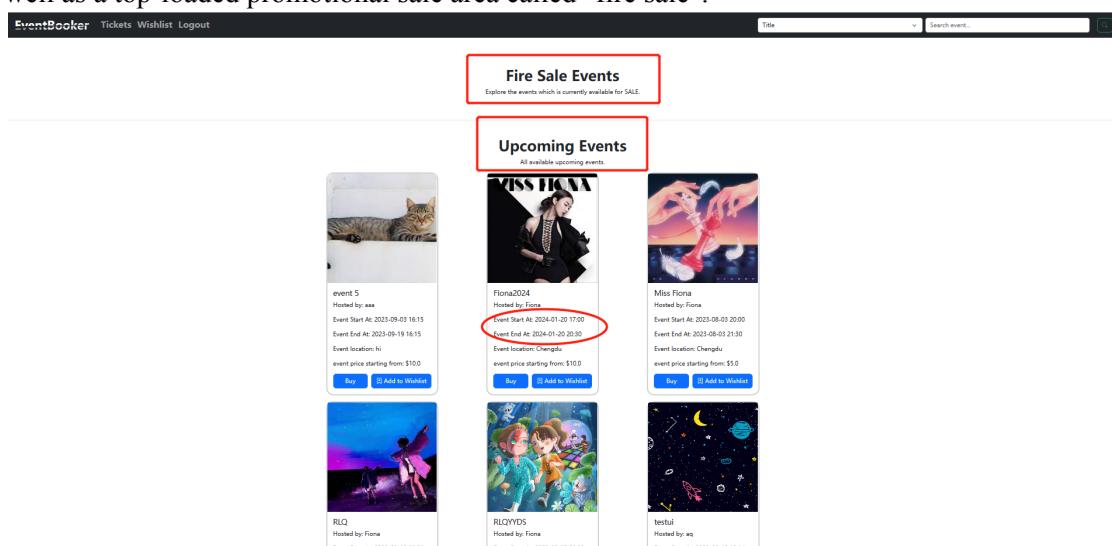
2.2.1 Backstory

The common functionality section is the functionality of the basic functionality group (generally available to USER/HOST accounts), which currently includes search, view, and message/reply functionality. These features allow events to be searched, the USER can ask simple questions to the HOST and the HOST is able to reply. These functions generally require a login to use (some features are limited when not logged in).

2.2.2 Clear workflow explanations and functional screenshots

a. Regarding event viewing, non-logged-in customers can only view events within the next month, and non-logged-in customers can see the details of these events, but cannot comment or purchase them (this is already mentioned in PART-I. Authentication).

When a customer logs in with a USER, its viewing homepage will show all future sales, as well as a top-loaded promotional sale area called "fire sale".



When a client logs in as a HOST, its viewing home page displays the activities it has created, divided into three areas: future upcoming, past events, and canceled events.

The screenshot shows the EventBooker application interface. At the top, there is a navigation bar with links for 'EventBooker', 'Add Events', and 'Logout'. Below the navigation bar, there is a search bar with a placeholder 'Search event...' and a dropdown menu with options: 'Title', 'Title', 'Start Date', and 'Location'. The main content area is divided into several sections:

- Upcoming Events:** A section titled 'Upcoming Events' containing three event cards. The first card is highlighted with a red border. Each card includes a thumbnail image, the event title (e.g., 'concert2077'), host information ('Hosted by: QAZ'), event details ('Event Start At: 2023-06-17 17:17', 'Event End At: 2023-06-19 17:17', 'Event location: NEW YORK', 'event price starting from: \$50.0'), and three buttons: 'Edit', 'Detail', and 'Cancel Event'.
- Cancelled Events:** A section titled 'Cancelled Events' containing two event cards. Each card includes a thumbnail image, the event title (e.g., 'FinalEvent 102' or 'FinalEvent 117'), host information ('Hosted by: QAZ'), event details ('Event Start At: 2023-01-02 20:03', 'Event End At: 2023-01-03 23:00', 'Event location: Central', 'event price starting from: \$0.01' for the first; 'Event Start At: 2023-04-01 18:45', 'Event End At: 2023-04-01 19:58', 'Event location: Green Square', 'event price starting from: \$3.07' for the second), and three buttons: 'Edit', 'Detail', and 'Cancel Event'.
- Past Events:** A section titled 'Past Events' containing three event cards. Each card includes a thumbnail image, the event title (e.g., 'FinalEvent 61', 'FinalEvent 93', 'FinalEvent 152'), host information ('Hosted by: QAZ'), event details ('Event Start At: 2023-06-21 02:02', 'Event End At: 2023-06-21 14:22', 'Event location: Kensington', 'event price starting from: \$49.49' for the first; 'Event Start At: 2023-09-11 06:51', 'Event End At: 2023-09-11 12:40', 'Event location: Kensington', 'event price starting from: \$49.76' for the second; 'Event Start At: 2023-09-11 06:51', 'Event End At: 2023-09-11 12:40', 'Event location: Kensington', 'event price starting from: \$49.76' for the third), and three buttons: 'Edit', 'Detail', and 'Cancel Event'.

- b. For the search function, it is disabled when the client is not logged in. When a customer logs in, the search function is unblocked. The search function has three filters: event title, start time, and location.

The screenshot shows the EventBooker application interface with the search function being used. At the top, there is a navigation bar with links for 'EventBooker', 'Add Events', and 'Logout'. Below the navigation bar, there is a search bar with a placeholder 'Search event...' and a dropdown menu with options: 'Title', 'Start Date', and 'Location'. The main content area is divided into several sections:

- Upcoming Events:** A section titled 'Upcoming Events' containing three event cards. The first card is highlighted with a red border. Each card includes a thumbnail image, the event title (e.g., 'concert2077'), host information ('Hosted by: QAZ'), event details ('Event Start At: 2023-06-17 17:17', 'Event End At: 2023-06-19 17:17', 'Event location: NEW YORK', 'event price starting from: \$50.0'), and three buttons: 'Edit', 'Detail', and 'Cancel Event'.
- Fire Sale Events:** A section titled 'Fire Sale Events' containing two event cards. Each card includes a thumbnail image, the event title (e.g., 'FinalEvent 102' or 'FinalEvent 117'), host information ('Hosted by: QAZ'), event details ('Event Start At: 2023-01-02 20:03', 'Event End At: 2023-01-03 23:00', 'Event location: Central', 'event price starting from: \$0.01' for the first; 'Event Start At: 2023-04-01 18:45', 'Event End At: 2023-04-01 19:58', 'Event location: Green Square', 'event price starting from: \$3.07' for the second), and three buttons: 'Edit', 'Detail', and 'Cancel Event'.
- Upcoming Events:** A section titled 'Upcoming Events' containing three event cards. Each card includes a thumbnail image, the event title (e.g., 'FinalEvent 61', 'FinalEvent 93', 'FinalEvent 152'), host information ('Hosted by: QAZ'), event details ('Event Start At: 2023-06-21 02:02', 'Event End At: 2023-06-21 14:22', 'Event location: Kensington', 'event price starting from: \$49.49' for the first; 'Event Start At: 2023-09-11 06:51', 'Event End At: 2023-09-11 12:40', 'Event location: Kensington', 'event price starting from: \$49.76' for the second; 'Event Start At: 2023-09-11 06:51', 'Event End At: 2023-09-11 12:40', 'Event location: Kensington', 'event price starting from: \$49.76' for the third), and three buttons: 'Edit', 'Detail', and 'Cancel Event'.

The start time filter does not need to be accurate to the exact hour and minute, it will return all events that will be held on a given day, and it supports selecting the time in a calendar format.

Fire Sale Events
Explore the events which is currently available for SALE.

Upcoming Events
All available upcoming events.

FinalEvent 56
Hosted by: Ann
Event Start At: 2023-09-26 17:59
Event End At: 2023-09-27 23:41
Event location: Randwick
event price starting from: \$34.22

Buy **Add to Wishlist**

It is important to note that the search function will return different results for different types of logged-in accounts (USER/HOST). For USER, the search function will search for all future events on sale and return results. For HOST, the search function will return the ones from HOST's own events that match the query conditions.

User's search for "event" Title

Upcoming Events
All available upcoming events.

FinalEvent 5
Hosted by: aaa
Event Start At: 2023-09-01 16:15
Event End At: 2023-09-19 16:15
Event location: N
event price starting from: \$10.00

Buy **Add to Wishlist**

FinalEvent 7
Hosted by: Ann
Event Start At: 2023-12-16 12:51
Event End At: 2023-12-18 19:57
Event location: Kingford
event price starting from: \$11.96

Buy **Add to Wishlist**

FinalEvent 8
Hosted by: Ann
Event Start At: 2023-10-22 12:01
Event End At: 2023-10-22 13:43
Event location: Green Square
event price starting from: \$77.05

Buy **Add to Wishlist**

HOST's search for "event" Title

Upcoming Events
All available events in next month.

FinalEvent 61
Hosted by: QAZ
Event Start At: 2023-08-23 02:02
Event End At: 2023-08-23 14:22
Event location: Kensington
event price starting from: \$49.49

Edit **Detail** **Cancel Event**

FinalEvent 190
Hosted by: QAZ
Event Start At: 2023-09-11 06:51
Event End At: 2023-09-13 12:40
Event location: Kensington
event price starting from: \$49.76

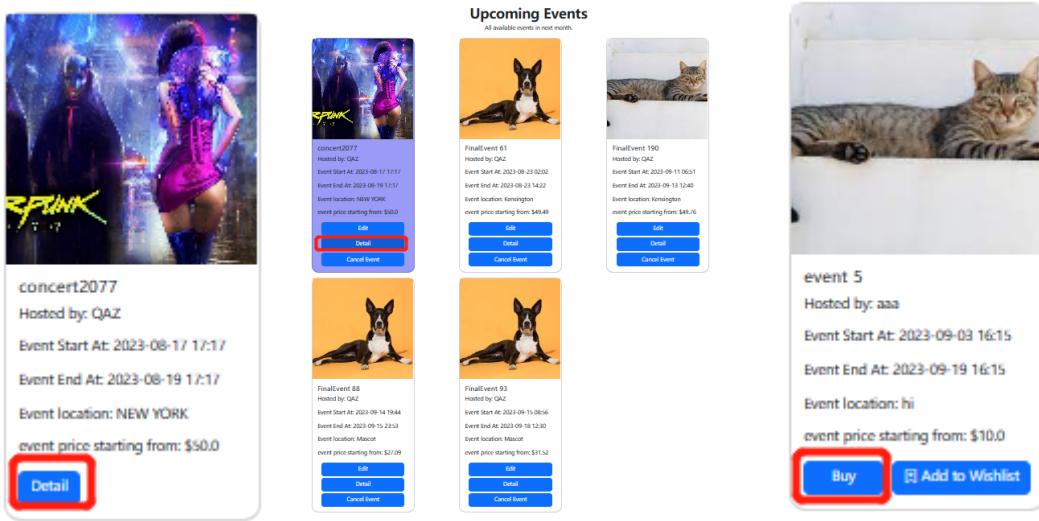
Edit **Detail** **Cancel Event**

FinalEvent 88
Hosted by: QAZ
Event Start At: 2023-09-14 19:44
Event End At: 2023-09-15 23:53
Event location: Mascot
event price starting from: \$27.09

Edit **Detail** **Cancel Event**

FinalEvent 93
Hosted by: QAZ
Event Start At: 2023-09-15 08:56
Event End At: 2023-09-18 12:30
Event location: Mascot
event price starting from: \$31.52

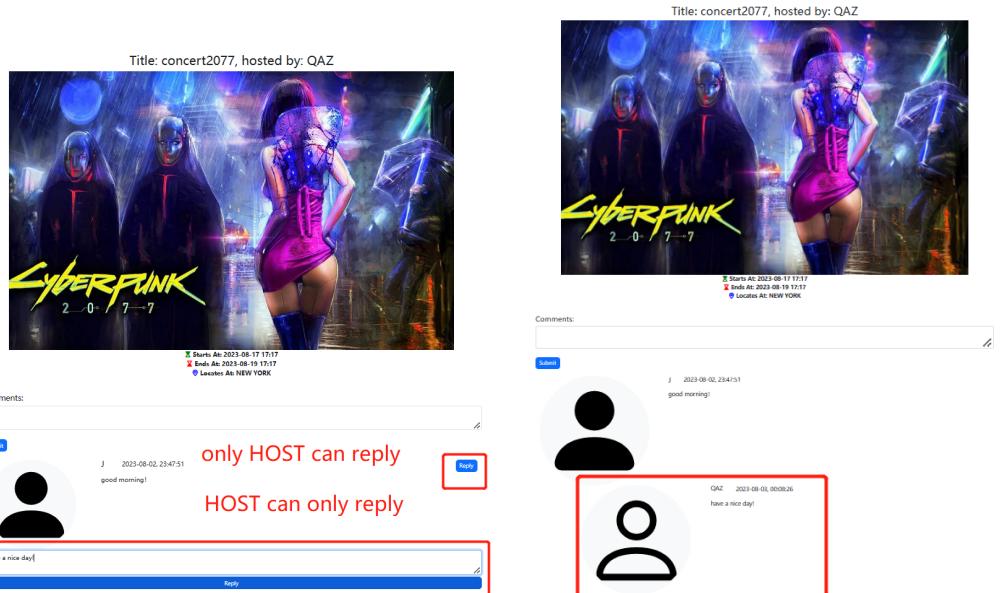
c. In order to facilitate communication between potential EVENT participants and HOST, we have provided a simple posting/replying to inquiries feature. This feature requires a login to post/reply, otherwise, you can only browse other people's conversations. For non-logged-in customers, you can click the "detail" button. For logged-in users, you can click the "buy" button. For logged-in HOST you can click the "detail" button. All three clicks will bring the page to the event detail page. On this page, you can browse to event details, read others' comments, or leave a comment/buy a ticket/reply to a comment (different functions depending on your login status).



For logged in USER, you can comment on the event whether or not you have already purchased a ticket for it, but you cannot reply to others' comments. The goal of our current commenting feature is to allow USERS who have or have not purchased tickets to make simple inquiries about the event, and HOSTs to provide simple answers, but no complex social features are included at this time.

When you are logged in as a HOST, you cannot initiate a comment, you can only reply to other people's comments.

The left screenshot shows a user comment interface. A red box highlights the comment input field. The comment reads: 'Yogi 2023-01-26, 16:32:08 When do we need to arrive?' Below the comment is a user profile icon and the name 'Fiona'. The right screenshot shows a host comment interface. A red box highlights a modal window titled 'Reminder' with the message 'Host can not comment.' Below the modal is a comment input field with the text 'Hi everyone' and a user profile icon.



Based on the commenting mechanism of this advisory board, HOST's replies and questions are one-to-one, which means that each comment can only be replied to once by HOST. By doing this, other people can clearly see each question and the corresponding answer. In addition, once a USER's comment has been replied to by HOST, an email reminder will be sent to the USER to check the comment board.

The screenshot shows an email notification from EventBooker. The subject is 'EventBooker: The Host has replied your comment!'. The message body says 'The host for event "concert2077" has replied your comment. Please check it out.' and ends with 'Best, Event Management System'.

2.3 As a Host

Story stream: We're a band and a friend of mine recommended I check out this site, it seemed like a good starting point for our public performances! I have an account now and I'm going to add our concert events for next month. This is our first event and I'm worried that there might be some unexpected situations, so I'd like to create event information that should be adjustable, such as the time, location, or poster for the event. When I adjust the event information the site should ideally automatically let fans who have bought tickets or are following me know about it. Given how little visibility our band has at the moment, we may also need a promotion to ensure that tickets can be sold. Let's see if the site can do all of this.

User story:

{As a host, I want to post a new event on this website with the information I provided, so it is viewable and purchasable.}

{As a host, I want to broadcast a message to all customers that have booked tickets to a given event via email, so that they have an alternative way to access the tickets they bought.}

{As a host, I want to cancel an event that has not started, so that this message will be broadcast to all customers who have booked tickets to this event and they can get their refund}

of this event.}

{As a host, I would like to have a chance to put the tickets for the events which are very close on sale, so that I can maximize my profit.}

2.3.1 Backstory

Event organizers are one of the main customers of our website, we want to facilitate the organization of their events, management of their events, and better selling of tickets. When a customer registers, they will be asked to select their identity USER/HOST. The host account is in a different functional group than the user account, the host account is mainly used for creating, modifying, and managing their own events for them.

2.3.2 Clear workflow explanations and functional screenshots

a. When a customer logs in, after successful password verification the system will check whether the logger is a HOST or a USER and show them different features. For HOST, their home page will be an overview page of all the events they have created, which will be categorized into upcoming events, past events, and canceled events. The HOST account's feature group will allow them to add new events, which is another difference it compares to USER account, host is easy to find the button to add new events in the entry above the homepage.

Upcoming Events

Cancelled Events

Past Events

Event Title	Hosted by	Event Start At	Event End At	Event Location	Event Status	Event Price
Cyberpunk	QAZ	2023-08-09 18:13	2023-08-16 18:14	Sydney	c	10000.0
complete the code	QAZ	2023-08-10 19:44	2023-08-30 19:50	Sydney	c	1000.0

b. When the host clicks on the add event button, it will be redirected to the event creation page. the host will be asked to enter the event title, start/end time, and location information, select the venue layout and ticket prices for different areas, and upload an event poster image.

The screenshot shows the 'Add Event' form with the following fields:

- Event Title:** concert
- Start Date&Time:** 2023/08/01 15:45
- End Date&Time:** 2023/08/02 15:45
- Location:** Sydney
- Poster:** Upload your poster (file chosen: timg741PUXJA.jpg)
- Seat Layout:** Choose a seat layout (Layout-1 selected, Layout-2 available)
- Prices:** Price for row 1 to row 3 | 100
Price for row 4 to row 6 | 70
Price for row 7 to row 9 | 50
- Buttons:** Add a new event, Layout-1, Layout-2

Add Event

The screenshot shows the 'Add Event' form with the following fields:

- Event Title:** (empty)
- Start Date&Time:** mm/dd/yyyy, --:-- --
- Date Picker:** August 2023 calendar showing the 4th of August selected.
- Time Picker:** PM selected, AM available
- Buttons:** Clear, Today, Layout-1

The start and end dates of the event are accurate to the specific time and minutes and have a reasonableness check, so it is not possible to enter the time of the start of the event before the current time or to make the end time before the start time.

The screenshot shows the 'Add Event' form with the following fields and validation messages:

- Event Title:** (empty)
- Start Date&Time:** mm/dd/yyyy, --:-- --
- End Date&Time:** mm/dd/yyyy, --:-- --
- Location:** (empty)
- Poster:** Upload your poster
- Seat Layout:** Choose a seat layout (Layout-1 selected, Layout-2 available)
- Validation Messages:**
 - Start datetime cannot be a past one!
 - The end datetime cannot be earlier than the start datetime!

When all inputs pass the plausibility check, the new event will be successfully created, displayed, and made public to the general public on the host's home page (USER can also see it on the site's home page). If the poster's IMAGE fails to upload due to network issues or is formatted incorrectly, the poster will not be displayed (we have added a format check). Host can re-edit the event again or upload a new poster.

EventBooker Add Events Logout

The screenshot shows the EventBooker application interface. At the top, there is a navigation bar with the text "EventBooker Add Events Logout". Below the navigation bar, there is a section titled "Upcoming Events" with a sub-instruction "All available events in next month.". A red box highlights a specific event card for "Concert33". The event card includes a thumbnail image of a car at night, the event name "Concert33", host information "Hosted by: QAZ", and event details: "Event Start At: 2023-08-05 10:43", "Event End At: 2023-08-06 10:43", "Event location: Sydney", and "event price starting from: \$100.0". Below the details are three blue buttons: "Edit", "Detail", and "Cancel Event". A yellow arrow points from the text "can re-edit it" to the "Edit" button.

Cancelled Events**Past Events**

- c. Host may find that there is something wrong with the event he created (in rare cases, it may be due to network problems or forcibly uploading files in the wrong format will be rejected), or he may need to re-edit the event information due to external factors. In the event card you can select the edit button to re-edit.

EventBooker Add Events Logout

The screenshot shows the EventBooker application interface. At the top, there is a navigation bar with the text "EventBooker Add Events Logout". Below the navigation bar, there is a section titled "Upcoming Events" with a sub-instruction "All available events in next month.". Two event cards are displayed. The first event card on the left is for "Concert33" and has a similar structure to the one in the previous screenshot. The second event card on the right is for "goood concert" and also includes a thumbnail image, event name, host information, event details, and three blue buttons: "Edit", "Detail", and "Cancel Event". A yellow box highlights the "Edit" button for the "goood concert" event card, and a red arrow points from the text "can re-edit it" to this highlighted button.

Cancelled Events**Past Events**

Edit your Event

Edit your Event

Event Title: Concert33
Start Date&Time: 2024/08/05 10:43
End Date&Time: 2024/08/06 10:43
Location: Sydney

Upload your poster
选择文件 未选择任何文件
Confirm Edit

Event Title: good concert
Start Date&Time: 2023/08/11 10:53
End Date&Time: 2023/08/12 10:53
Location: New York


Upload your poster
选择文件 未选择任何文件
Confirm Edit

Fire Sale!!!
Update the price of the seats!

Row 1 to row 3 Original Price: \$200.0
Current Price: \$ [200.0]
Row 4 to row 6 Original Price: \$150.0
Current Price: \$ [150.0]
Row 7 to row 9 Original Price: \$100.0
Current Price: \$ [100.0]
Fire Sales!

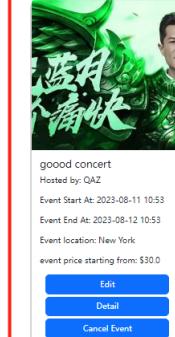
Fire Sale!!!
Update the price of the seats!

Row 1 to row 2 Original Price: \$30.0
Current Price: \$ [30.0]
Row 3 to row 4 Original Price: \$50.0
Current Price: \$ [50.0]
Fire Sales!

When re-editing the event, all the old information will be inherited and displayed, host does not need to repeat the input. Host can modify any information except seat-layout (to protect the rights of customers who have already purchased tickets, we currently restrict host to replace the location must be hosted in the same layout of the venue, because different venues may have different (To protect the rights of customers who have already bought tickets, we currently restrict the host to replace the location with the same layout, because different venues may have different viewing experience)).

Upcoming Events
All available events in next month


Concert33
Hosted by: QAZ
Event Start At: 2023-08-05 10:43
Event End At: 2023-08-06 10:43
Event location: Sydney
event price starting from: \$100.0
Edit
Detail
Cancel Event


good concert
Hosted by: QAZ
Event Start At: 2023-08-11 10:53
Event End At: 2023-08-12 10:53
Event location: New York
event price starting from: \$30.0
Edit
Detail
Cancel Event

fix by re-upload a new poster

Cancelled Events

Past Events

Fire Sales Warning: New price cannot be greater than the current price. Please check the new price for row 1 to row 3!

Edit your Event

Event Title Concert33	Start Date/Time 2023/08/05 10:43
End Date/Time 2023/08/06 10:43	Location Sydney
	
Upload your poster	
<input type="button" value="Confirm Edit"/>	

Fire Sale!!!

Update the price of the seats:


Row 1 to row 3 Original Price: \$200.00
Current Price: \$100.00
Row 2 to row 3 Original Price: \$150.00
Current Price: \$100.00
Row 3 to row 3 Original Price: \$100.00
Current Price: \$100.00
<input type="button" value="Fire Sale!"/>

Additionally, host can lower the price of tickets and trigger a promotional feature. Displaying the event in the "fire sale" section of the USER interface makes it easier to find the event. But HOST was made unable to raise prices (to prevent frequent price adjustments). If all information in the event re-edit passes the test, then the event will be successfully edited. When an event is re-edited, USERs with the event in their wishlist or USERs who have already purchased tickets will receive an E-mail push notification alerting them that the information has been updated. Customers who have already bought tickets will not receive the promotion notification. USERs will also not be notified by email for updates that only change the poster.

Fire Sale Events

 Testing Hosted by me Event Start At: 2023-08-01 18:12 Event End At: 2023-08-02 18:12 Event location: Kensington Event Status: v Event price starting from: 4.9	 NEW CONCERT Hosted by QAZ Event Start At: 2023-08-04 16:00 Event End At: 2023-08-05 16:10 Event location: NEW YORK Event Status: v Event price starting from: 20.0	 X Hosted by QAZ Event Start At: 2028-09-10 17:13 Event End At: 2028-10-08 17:13 Event location: X Event Status: v Event price starting from: 99.0
<input type="button" value="Back"/> <input type="button" value="Reply"/> <input type="button" value="Reply All"/> <input type="button" value="Forward"/> <input type="button" value="Delete"/> <input type="button" value="Delete Permanently"/> <input type="button" value="Display on Top"/> <input type="button" value="Mark as <v>"/> <input type="button" value="Move to <v>"/> <input type="button" value="Reject"/> <input type="button" value="Report"/>		

EventBooker: The event related to you has NEW UPDATE! ⚡

COMP9900H16ASUN

Note: You are a Bcc recipient of this email and thus not displayed in the recipients.

 Emails can be translated to Chinese. [Translate](#)

Dear Customer,

The event "concert2077" has been updated by the host.
 These are the new details:
 The Event Title: "concert2077".
 The StartDate: "2023-08-19".
 The StartTime: "17:17".
 The EndDate: "2023-08-19".
 The EndTime: "17:17".
 The Location: "NEW YORK".
 Thanks for your attention!

Best,
 Event Management System

d. The event may need to be canceled for some reason, and HOST can also find a cancel button on the event card. When an event is canceled, USERs with the event in their wishlist or USERs who have already bought tickets will receive an E-mail push notification alerting them that the event has been canceled, and those who have already bought tickets will receive a refund within a certain period of time.

upcoming events

EventBooker: Your wishlist events have NEW UPDATE! ☆

CO COMP9900H16ASUN

Note: You are a Bcc recipient of this email and thus not displayed in the recipients.

Emails can be translated to Chinese. [Translate](#)

Dear Customer,

The event "concert999" has been cancelled by the host.
Thanks for your attention!

Best,
Event Management System

< Back Reply Reply All Forward Delete Delete Permanently Display on Top Mark as ▾

EventBooker: Event Cancellation! ☆

CO COMP9900H16ASUN To Mine

Emails can be translated to Chinese. [Translate](#)

Dear Customer,

The event "concert500" has been cancelled by the host.
The ticket(s) you have booked will be refunded to your payment card.

Best,
Event Management System

2.4 As a User

Story stream: A band friend of mine just created their concert EVENT for next month on this site and I wanted to buy a ticket on the site to go to the show! I also want to go to another concert but I'm not sure if I'll have time that day yet, I'm going to add it to my wishlist first so I won't miss any new updates on it.

User story:

{As a customer, I want to book tickets so that I can buy the desired seats for my desired events.}

{As a customer, I want to cancel the ticket I buy for an event if its scheduled date is more than 7 days from now on, so that I can get a refund of this ticket and others are able to buy it.}

{As a customer, I would like to add events to my wishlist, so that I have efficient access to it when I have made up my mind.}

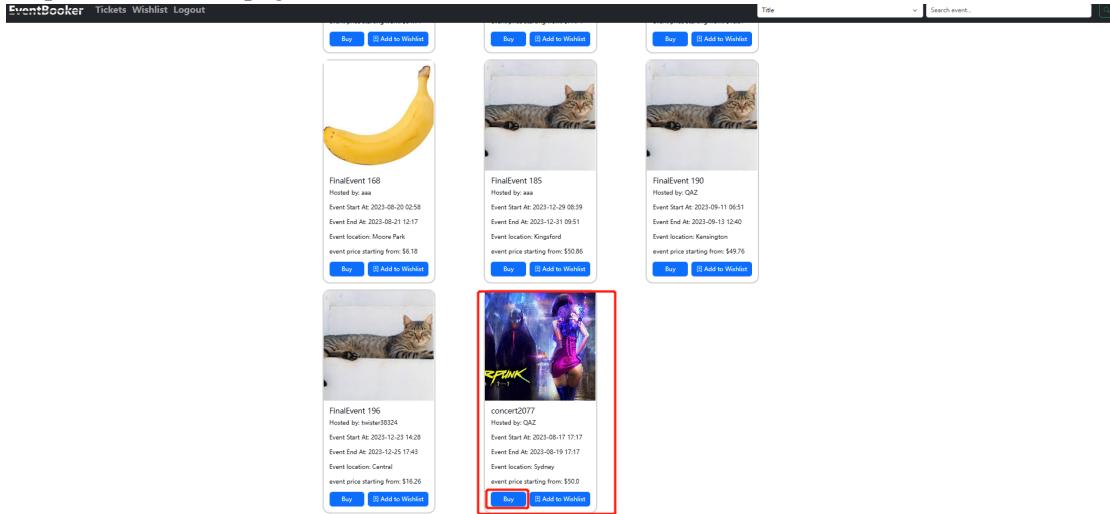
{As a customer, I would like to get notifications via email about the updates of the events I have added to my wishlist so that I don't miss any updates.}

2.4.1 Backstory

Potential event attendees are one of the main customers of our site, and the core function of a USER account is to buy tickets and track events. We want to better bridge the relationship between event organizers and event attendees, and for each event, we group customers who have already purchased tickets and wishlist customers to ensure that they receive timely emails with event content updates, ticket vouchers, and refunds/after-sales service. Additionally, like the HOST account, the USER account will have its own unique feature group and homepage, which will provide quick access to all the ticketing and wishlist information under the account.

2.4.2 Clear workflow explanations and functional screenshots

- a. Once the customer is logged in with USER, the customer will be able to see all future events. for each event card, clicking on the BUY button will take them to the event details and the purchase/review page.



USER can select a seat on the event-buy details page and all available/already selected seats will be dynamically displayed. The seats in red color are already purchased by someone else and the user will not be able to select them (clicking on them is disabled). After selecting an available seat (or multiple seats at once) the current total fare to be paid will be dynamically displayed. Continuing to click on the buy button will bring up the payment window, displaying the information about the seat number the USER has just selected and asking for payment information.

Click on Confirm to finalize the payment, and the previously selected seats will turn red and

be locked. The customer will receive information about the ticket just purchased in his or her email address (in a realistic implementation, we assume that this may contain a digital voucher, such as a QR code for the ticket. The customer can either show the email or take a screenshot/print it to pass the ticket validation for the event, here we use the ticket ID instead).

Title: Fiona2024, hosted by: Fiona

The screenshot shows a booking interface for an event titled "MISS FIONA". At the top, there is a thumbnail image of a woman in a black dress. Below the thumbnail, event details are listed: Starts At: 2024-01-20 17:00, Ends At: 2024-01-20 20:30, and Locates At: Chengdu.

Seats:

A seating chart displays a grid of seats. Some seats are red (Sold), some are green (Available), and one seat in the second row from the bottom is highlighted with a yellow box. This highlighted seat is also circled with a yellow marker in the original image.

Available: **Sold:** **Selected:**

Selected Seats:

Current Total: 0

Buy

On the right side, there is an "EventBooker: Event Tickets Purchase Confirmation!" message. It includes a recipient section (COMP9900H16ASUN To Mine), a note that emails can be translated to Chinese, and a detailed purchase summary.

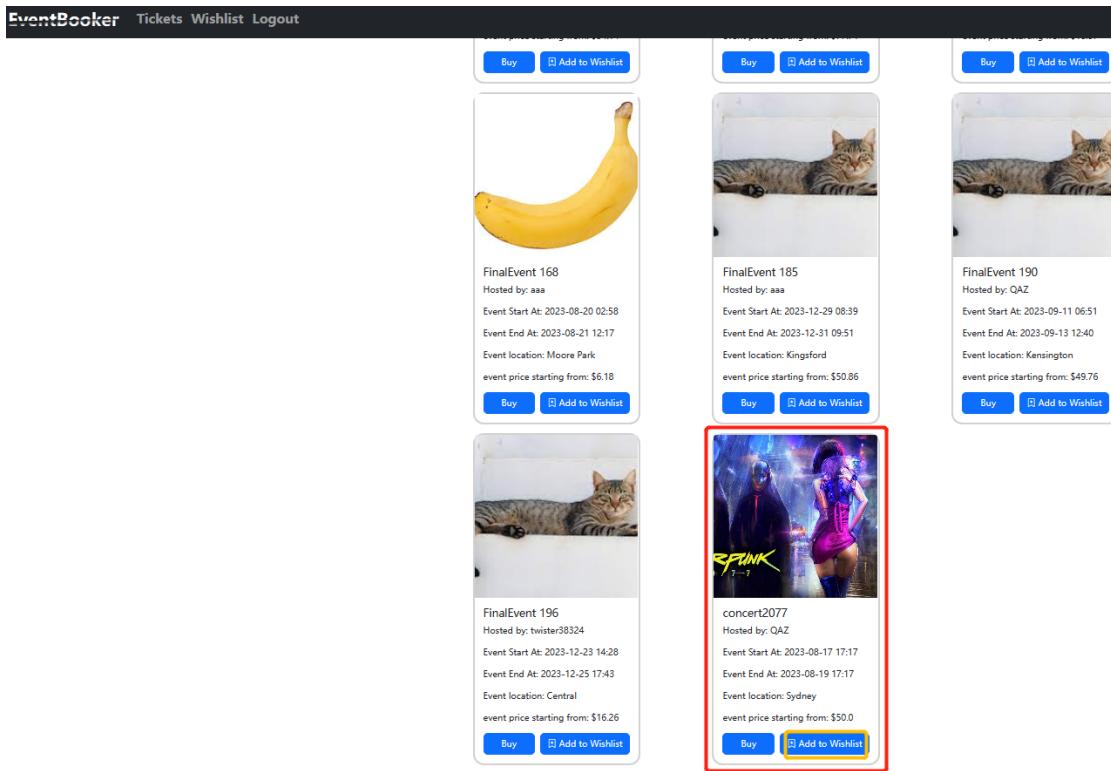
Purchase Details:

- Transaction Id: 60
- Row: 2, Column: 3
- Row: 2, Column: 4

Total cost: \$20

Best,
Event Management System

- b. USER can see the "add to wishlist" button next to the buy button in the event tab after logging in, clicking on the button will add the event to the wishlist, and clicking on it again will remove it from the wishlist.



When HOST updates event information, USERS will be alerted by email if they have already purchased tickets or followed the event (this feature is also explained in HOST-part: when HOST re-edits the event, emails will be pushed to groups of customers).

The screenshot shows an email alert from EventBooker. The subject line is "EventBooker: The event related to you has NEW UPDATE! 🌟". The email body contains the following information:

- From:** COMP9900H16ASUN
- Note:** You are a Bcc recipient of this email and thus not displayed in the recipients.
- Message Content:**

Emails can be translated to Chinese. [Translate](#)

Dear Customer,

The event "concert2077" has been updated by the host.
 There are the new details:
 The Event Title: "concert2077".
 The StartDate: "2023-08-17".
 The StartTime: "17:17".
 The EndDate: "2023-08-19".
 The EndTime: "17:17".
 The Location "NEW YORK".
 Thanks for your attention!

Best,
 Event Management System

c. When a customer is logged in as a USER account, there will be "tickets" and "wishlist" buttons in the top function bar.

The screenshot shows the EventBooker homepage. At the top, there are navigation links: EventBooker, Tickets (highlighted with a red box), Wishlist, and Logout. A search bar at the top right includes fields for Title and Search event... with a magnifying glass icon.

Fire Sale Events
Explore the events which is currently available for SALE.

Upcoming Events
All available upcoming events.

Event details for several upcoming events are listed:

- event 5 Hosted by: aaa
Event Start At: 2023-09-03 16:15
Event End At: 2023-09-19 16:15
Event location: hi
event price starting from: \$10.0
[Buy](#) [Add to Wishlist](#)
- Fiona2024 Hosted by: Fiona
Event Start At: 2024-01-20 17:00
Event End At: 2024-01-20 20:30
Event location: Chengdu
event price starting from: \$10.0
[Buy](#) [Add to Wishlist](#)
- Miss Fiona Hosted by: Fiona
Event Start At: 2023-08-03 20:00
Event End At: 2023-08-03 21:30
Event location: Chengdu
event price starting from: \$5.0
[Buy](#) [Add to Wishlist](#)
- RLQ Hosted by: Fiona
Event Start At: 2023-08-12 20:00
- RLOIYDS Hosted by: Fiona
Event Start At: 2023-08-05 20:00
- testful Hosted by: aa
Event Start At: 2023-08-10 18:14

Clicking on the tickets button will allow you to see all of your ticketing history. On the tickets page, you can browse all of your ticket purchases and click cancel on the right side to refund tickets for events that have not started. Once confirmed, you will be notified via email that your ticket has been successfully refunded, and you will receive a refund accordingly.

The screenshot shows the 'Cancelled Tickets' section of the EventBooker Tickets page. It displays a table of cancelled tickets with columns: Event Title, Start Datetime ~ End Datetime, Row&Column, Transaction Date, Price, and Action (with a 'Cancel' button).

Event Title	Start Datetime ~ End Datetime	Row&Column	Transaction Date	Price	Action
Fiona2024	2024-01-20 17:00~2024-01-20 20:30	r2c3	2023-08-02	10\$	Cancel
Fiona2024	2024-01-20 17:00~2024-01-20 20:30	r2c4	2023-08-02	10\$	Cancel
concert500	2023-08-04 12:06~2023-08-05 12:06	r2c3	2023-08-03	10\$	Cancel

There is a limitation here, USER can only actively cancel tickets that are at least one week away from the event. If the distance from the event start time is too close, the ticket cancellation function will be disabled.

The screenshot shows the 'My Tickets' section of the EventBooker Tickets page. It displays a table of my tickets with columns: Event Title, Start Datetime ~ End Datetime, Row&Column, Transaction Date, Price, and Action (with a 'Cancel' button). A note at the bottom states: "Note: you cannot cancel a ticket due in 7 days." with a red arrow pointing to the note.

Event Title	Start Datetime ~ End Datetime	Row&Column	Transaction Date	Price	Action
Fiona2024	2024-01-20 17:00~2024-01-20 20:30	r2c3	2023-08-02	10\$	Cancel
Fiona2024	2024-01-20 17:00~2024-01-20 20:30	r2c4	2023-08-02	10\$	Cancel
concert500	2023-08-04 12:06~2023-08-05 12:06	r2c3	2023-08-03	10\$	Cancel

Note: you cannot cancel a ticket due in 7 days.

Cancelled Tickets

Event Title	Start Datetime ~ End Datetime	Row&Column	Transaction Date	Price	Action
Fiona2024	2024-01-20 17:00~2024-01-20 20:30	r4c4	2023-07-16	20\$	Cancelled
Programming	2023-08-09 18:13~2023-08-16 18:14	r4c5	2023-07-16	30000\$	Cancelled
complete the code	2023-08-10 19:44~2023-08-30 19:50	r4c6	2023-07-17	1500\$	Cancelled
concert2077	2023-08-18 17:17~2023-08-19 17:17	r5c6	2023-08-03	70\$	Cancelled
concert999	2023-08-05 11:56~2023-08-06 11:56	r2c5	2023-08-03	50\$	Cancelled
concert110	2023-08-05 11:59~2023-08-07 12:00	r3c1	2023-08-03	90\$	Cancelled



EventBooker: Ticket Cancellation! ☆

COMP9900H16ASUN

Note: You are a Bcc recipient of this email and thus not displayed in the recipients.

To protect your safety, some pictures of this email have not been downloaded.

Emails can be translated to Chinese. [Translate](#)

Dear "J",

The ticket for event "Fiona2024" has been cancelled by you.
The ticket you have booked will be refunded to your payment card.

Best,
Event Management System

Clicking on the wishlist button will quickly filter the event to a list that has been marked as a wishlist. You can quickly go to the event purchase page or remove the event from the wishlist.

The screenshot shows a user interface for managing a wishlist. At the top, there's a navigation bar with links for 'EventBooker', 'Tickets', 'Wishlist', and 'Logout'. On the right side of the bar are search fields for 'Title' and 'Search event...' with a magnifying glass icon. Below the navigation is a section titled 'wishlist' with a sub-header 'Events'. Two event cards are displayed side-by-side:

- Event 1 (Left):** 'complete the code' (Image: Girl with dark hair). Details: Event Start Date: 2023-08-10, Event Start Time: 19:44, Event End Date: 2023-08-30, Event End Time: 19:50, Hosted by: QAZ, Event price starting from: 1000.0. Buttons: 'Buy' (blue), 'Wishlist Remove' (orange).
- Event 2 (Right):** 'concert2077' (Image: Girl in a purple outfit). Details: Event Start Date: 2023-08-17, Event Start Time: 17:17, Event End Date: 2023-08-19, Event End Time: 17:17, Hosted by: QAZ, Event price starting from: 50.0. Buttons: 'Buy' (blue), 'Wishlist Remove' (orange).

3. Third-party functionalities

3.1 Flask

Flask (Flask, 2023) provides configuration and conventions, with sensible defaults, to get started. This section of the documentation explains the different parts of the Flask framework and how they can be used, customized, and extended. Beyond Flask itself, look for community-maintained extensions to add even more functionality.

3.2 Bootstrap

Bootstrap (Bootstrap, 2023) is a powerful, feature-packed frontend toolkit. Build anything—from prototype to production—in minutes.

Bootstrap is a free front-end framework for faster and easier web development.

Bootstrap includes HTML and CSS-based design templates for typography, forms, buttons, tables, navigation, modals, image carousels, and many others, as well as optional JavaScript plugins.

Bootstrap also gives you the ability to easily create responsive designs.

3.3 Werkzeug

Werkzeug (Werkzeug, 2023) is a comprehensive [WSGI](#) web application library. It began as a simple collection of various utilities for WSGI applications and has become one of the most advanced WSGI utility libraries.

Werkzeug doesn't enforce any dependencies. It is up to the developer to choose a template engine, database adapter, and even how to handle requests.

We use the security functionality from this library to hash coded the password input by the users. In this way, we cannot view the real passwords created by the users, which greatly protects the security of their accounts.

4. Implementation challenges

This section focuses on the detailed considerations, challenges, and advanced techniques used during the implementation of the project.

4.1 Authentication part

One of the most important parts of Authentication's security is password protection. We consider the risk of interception of passwords during transmission and theft of passwords from data.

```
from werkzeug.security import
    generate_password_hash, check_password_hash
```

Fig 4. Import third-party library to protect user password

Our solution to this is to encrypt the user's input at the outset using a hash algorithm, specifically by the werkzeug.security library, we use the SHA256 algorithm (which can be found in python's security extension package).

All hash functions (e.g. SHA256) are irreversible, the user's input will be mapped to a hash string, this mapping is a one-to-one correspondence, and we can compare the mapped value to determine whether the user's password input is correct. However, if someone only knows the mapping to try to reverse the original password value is almost impossible to do (requires a huge amount of computation), so far this algorithm is still reliable, and is used in a variety of fields.

```

else:
    user_type = request.form.get('type')
    hashed_password = generate_password_hash(request.form['password'], method='sha256')
    if user_type == 'host':
        db.execute('insert into Users (email, name, password, is_host) values (?, ?, ?, ?)', [
            request.form['email'],
            request.form['username'],
            hashed_password,
            True
        ])
        db.commit()
        session['emailaddress'] = request.form['email']
        session['is_host'] = True

```

Fig 5. Screenshot of how to hash user's password

We have hash encryption at the very beginning of the customer user's password entry as shown in *Fig 5*, which means that the password is completely encrypted before it is transmitted to the backend, so that even if the website's database is lost, the original password will still not be stolen.

4.2 Common Function part

The relationship between the reply and comment is one-to-one. So, the problem is raised when the host is trying to reply to a comment without knowing the id of that comment. Our solution is to send this information to the frontend and store it in the id tag of HTML elements as shown in *Fig 6*. Hence, after the host finishes replying the comments, the id information will be sent along with the reply string to the backend to store in the database without further interaction with the database to get the id of the corresponding comment.

```

{% if session['is_host'] %}


<button type="button" class="btn btn-sm btn-primary" style="float: right;" onclick="reply(this.id)" id="{{ comments[i]['id'] }}">
        <!-- <p onclick="reply(this.id)" class="zoom" style="color: blue;" id="{{ comments[i]['id'] }}>reply</p> -->
    </button>


{% endif %}

```

Fig 6. Screenshot of comment id storing in id tag

4.3 Host part

When implementing the Cancel Event function, we added a confirmation popup window to prevent the client from clicking the button by mistake, the client must click the confirmation button to cancel the event, but if we follow the traditional practice of implementing the confirmation popup window for each event in the front-end code, this will cause code redundancy problems.

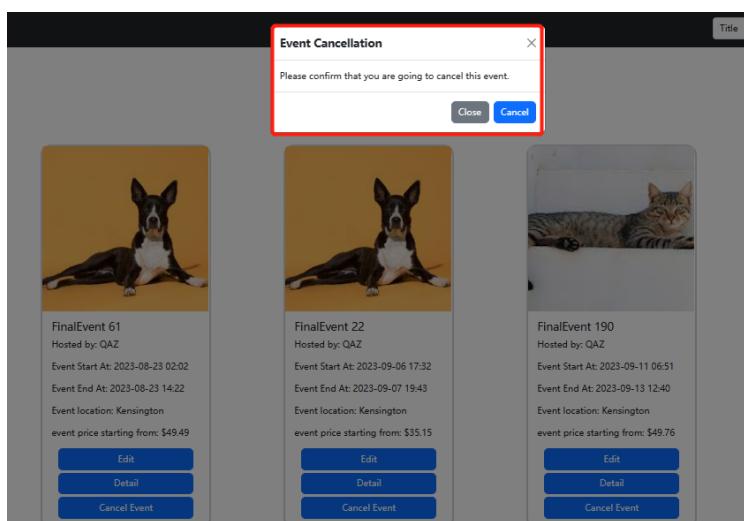


Fig 7. Screenshot of modals

We are now applying the dynamic modal technique so that when the client clicks the cancel button on each event card as shown in *Fig 7*, its eventID will be uploaded to the front-end popup (which will know which event the client wants to cancel), and we only need to implement a popup element in the front-end code. By doing so, we have greatly simplified the code and avoided bloated code.

Moreover, In the mail feature, we need to push some messages to multiple accounts' mailboxes. We found two potential problems: one is that some of the cc's end recipients will see the email addresses of all the people being mass-mailed, which will expose the email addresses of our other customers and cause privacy issues. The other issue is that we have found that some mailers' firewalls may block certain protocols or email addresses (e.g., universities' firewalls), which would prevent them from receiving our outgoing mail.

```
def send_email(senderName, title, message, recipients=None, bcc=None):
    #app = Flask(__name__)
    app.config['MAIL_SERVER'] = 'smtp.gmail.com' # Server address
    app.config['MAIL_PORT'] = 465 # Server port number
    app.config['MAIL_USE_TLS'] = False # Encryption method: not TLS
    app.config['MAIL_USE_SSL'] = True # Encryption method: SSL
    app.config['MAIL_USERNAME'] = 'COMP9900H16ASUN@gmail.com' # Address of our official email
    app.config['MAIL_PASSWORD'] = 'flujakacaqjpqeob' # Password of our official email: COMP9900H16ASUN@gmail.com
    mail = Mail(app)

    with app.app_context():
        msg = Message(title, sender=(senderName, app.config['MAIL_USERNAME']), recipients=recipients, bcc=bcc)
        msg.html = message
        mail.send(msg)
```

In order to maintain the privacy of our users, as well as to ensure that our users are diverse, we have tried many different protocols and have finally settled on the bcc email delivery method. Blind cc is a method of sending mail (abbreviated as bcc method), by which we make it possible for a customer to receive mail without knowing the e-mail addresses of other people who are receiving the mail at the same time. This method also makes it possible for as many different groups of customers as possible to receive the mail (although some schools may not be able to receive the mail due to their firewalls).

4.4 Host part

In our implementation of dynamic seat selection, we found that storing each event as a KEY in the database with the purchase status of all the seats it owns would result in too many variables being stored in the event table and affect performance (selecting seats dynamically may require multiple queries). Therefore, we only store the seat-layout for each event, which is very easy to store since each venue-layout has a fixed number of rows and columns. When we want to dynamically query the seat selection status, we do this by querying the eventID for all sold tickets and passing them back to the front-end to display in conjunction with the layout. We only store the sold tickets (seat numbers) in the database, and the layout can be extrapolated to find the unsold tickets. In this way, the database query burden is greatly reduced.

5. Future Work

This section focuses on potential future expansion and improvement of the project.

5.1 Authentication part

As it is a project demo, we did not add the authenticity verification of the email address in the registration session. In the future, we can refer to the common practice in the industry: send a verification email and ask the customer to enter the verification code or click the verification link to complete the whole registration process. This way we can reduce the number of invalid or illegal users in the database and reduce the possibility of server attack.

5.2 Common Function part

We may upgrade the common feature group in the future, which may include: displaying more details about the event (long text description), and allowing the organizer to post some information proactively (informational announcements). Allow multiple replies. Allow customization of avatars and creation of profile information. Deleting or modifying comments, controlling restrictive and sensitive vocabulary. Liking comments, sorting comments.

This is one of the reasons why we have listed the common function groups separately: if we are going to significantly expand our program someday, this will allow us to be very flexible in our development. Instead of having separate feature implementations for USER and HOST, we can just upgrade the common function group.

5.3 Host part

- a. We have fewer seat-layout styles for our hosting locations and this feature is more difficult to implement, so it's not flexible at the moment. In the future, we might consider binding the layout to the event location since most event venues have a fixed layout and a check on whether the location exists on the map. Alternatively, we could allow hosts to customize them, which may require more complex code to implement.
- b. In the future, we may introduce a statistical system so that hosts can see the number of tickets sold and the number of views for each event, helping organizers to better manage their events.
- c. We may improve the event details in the future so that the organizer can have some long text additional details (some textual description) of the event.

5.4 User part

For customers, the recommendation performance of a commodity Web site may be an important factor for users to choose it. Unfortunately, the current version of the site does not have enough information (e.g., category labels of events, customer ratings of events, long textual descriptions of events, etc.) to support a robust recommendation system. In the future, we may be expanding more of the base modules (details are in the future enhancements to the CommonFunction-part), and we may have enough information to implement a good recommender system to recommend content that may be of interest to customers.

6. Project Setup and User Manual

6.1 Project Setup

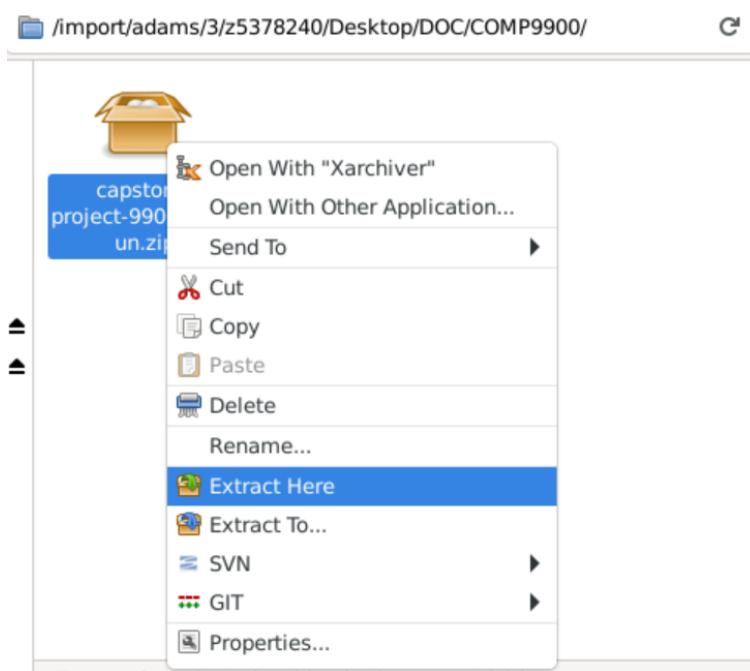
This part will lead you to set up the whole project in a few simple steps. Besides, all the functionalities will be illustrated with detailed steps.

Environment: CSE vlab machines

Note: Please use Google Chrome to have the best experience.

Here are the steps to setup the whole project in the CSE vlab machines:

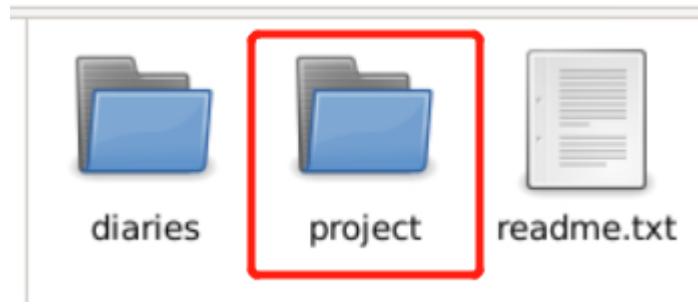
1. Change to the folder including the file “capstone-project-9900h16asun.zip”
2. Right click the “capstone-project-9900h16asun.zip” and choose “Extract Here”



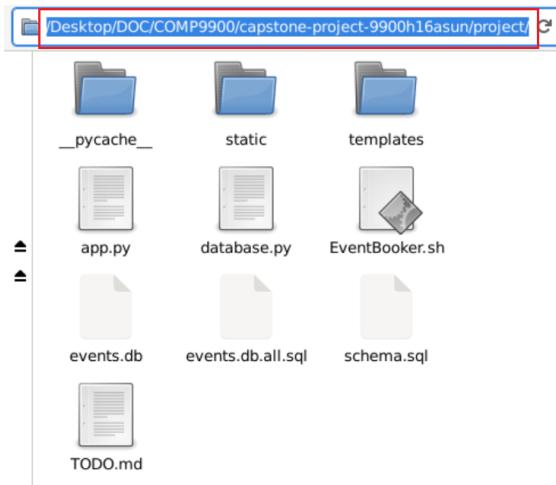
3. Double click the extracted file:



4. Then double click the “project” file:

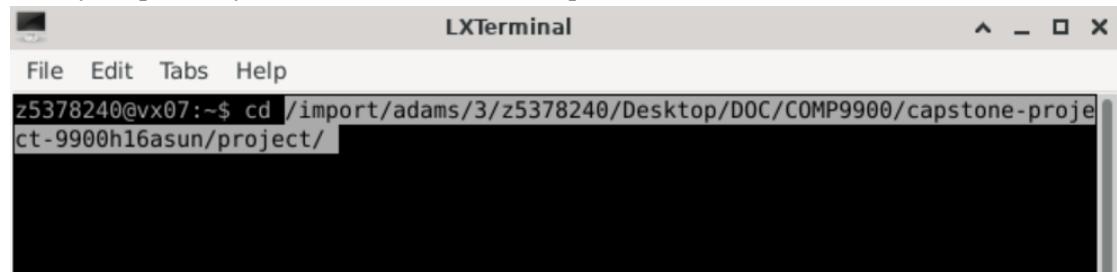


5. Copy the current path and open the terminal by pressing Ctrl + Alt + T:
Note: your path may be different from the example below

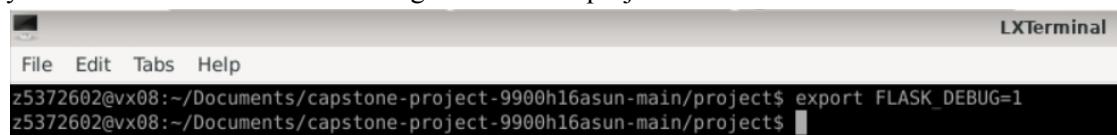


6. Type “cd ” in the terminal and paste the path behind the “cd ” by pressing Ctrl +Shift + V

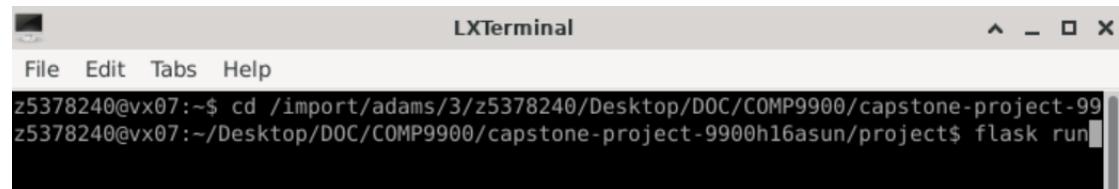
Note: your path may be different from the example below



7. [Optional] Press the “Enter” key and type in “export FLASK_DEBUG=1” if you would like to turn on the debug mode of this project.

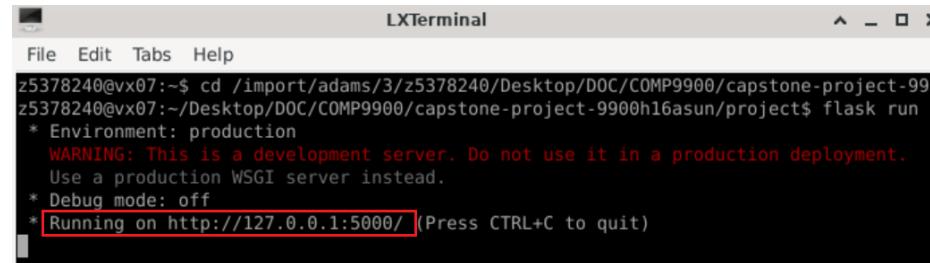


8. Press the “Enter” key and type in “flask run”:



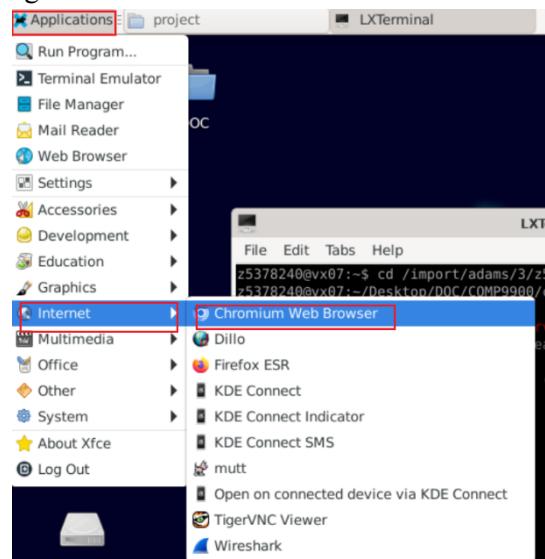
```
LXTerminal
File Edit Tabs Help
z5378240@vx07:~$ cd /import/adams/3/z5378240/Desktop/DOC/COMP9900/capstone-project-99
z5378240@vx07:~/Desktop/DOC/COMP9900/capstone-project-9900h16asun/project$ flask run
```

9. Press the “Enter” key again and the project is running from now on:

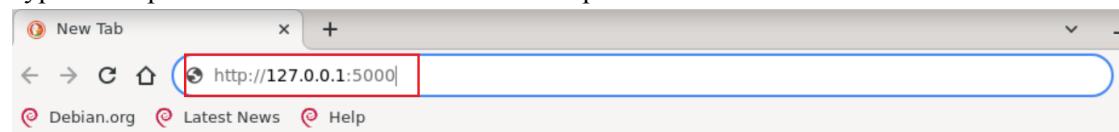


```
LXTerminal
File Edit Tabs Help
z5378240@vx07:~$ cd /import/adams/3/z5378240/Desktop/DOC/COMP9900/capstone-project-99
z5378240@vx07:~/Desktop/DOC/COMP9900/capstone-project-9900h16asun/project$ flask run
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

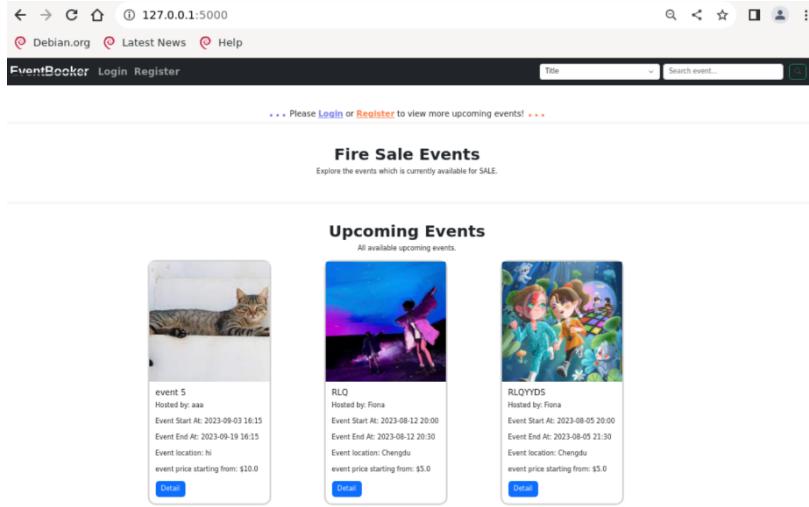
10. Next open a Google Chromium Web Browser:



11. Type in “<http://127.0.0.1:5000/>” as the URL and press “Enter”:



12. Congratulations! You can view the website now :)



13. You can use the incognito window of the Chrome Web Browser to simulate login of 2 different users.

6.2 User Manual

6.2.1 Prospective Users

If you do not want to login as a user or host, you can still view the website and the Upcoming Events, including fire sale events, whose start date is in the upcoming 1 month and tickets have not been sold out.

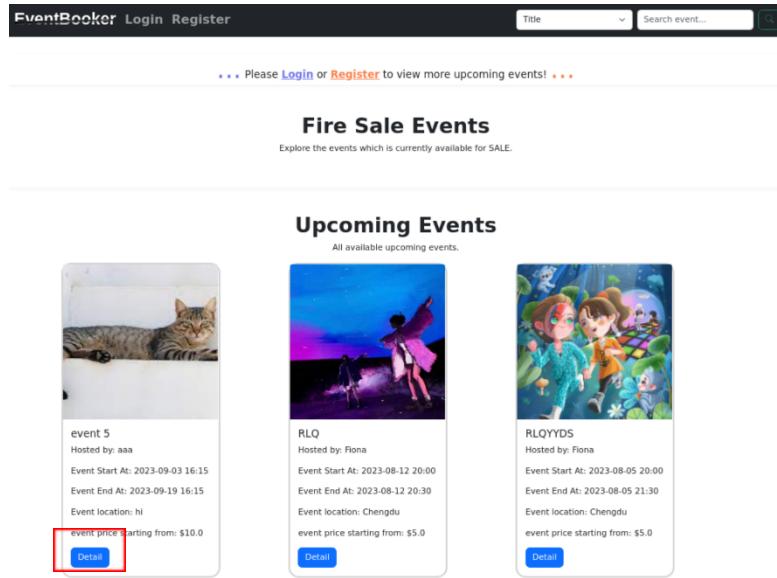


Fig 8. Home page - for prospective users,

You can click on the “Detail” button to view the event details, including the seat details, ticket price, current seat availability and comments of this event.

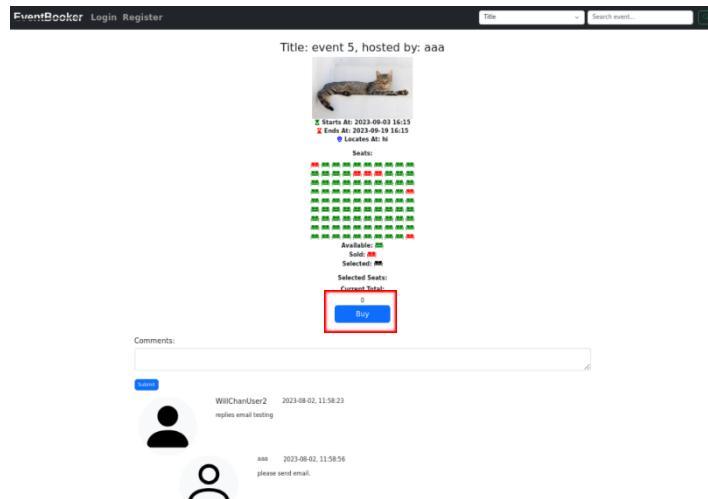


Fig 9. Event page for prospective users

However, you are not able to buy any tickets or leave any comments if not logged in. For example, if you click on the “Buy” button, you will be asked to login first.

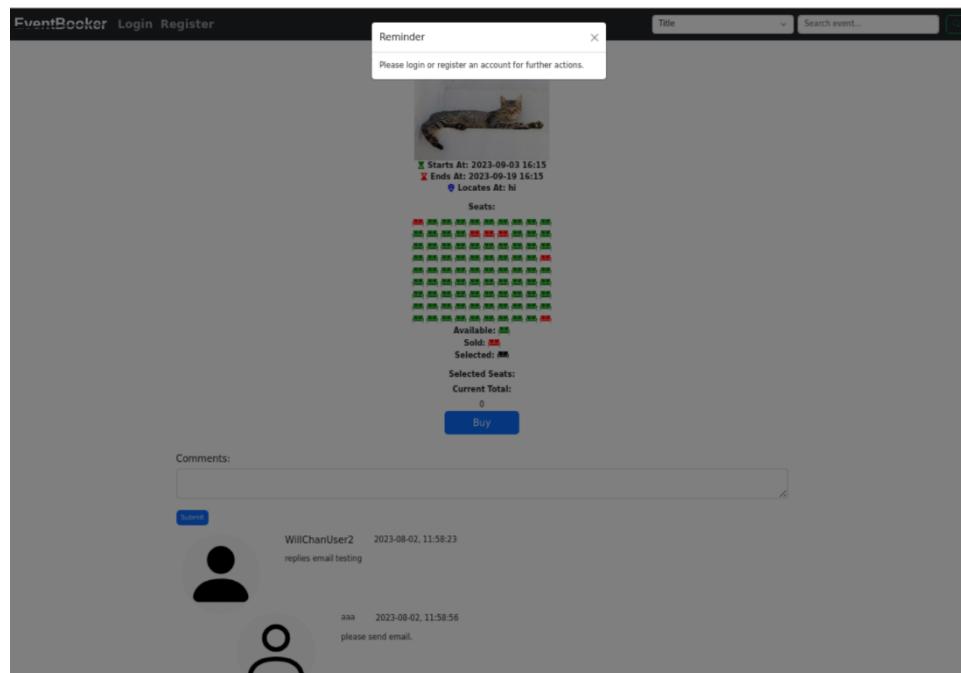


Fig 10. Event page for prospective users - buy ticket

And this will be the same for the “Submit” button, which is for the comments. Besides, the Event Search function is disabled for prospective uses as well.

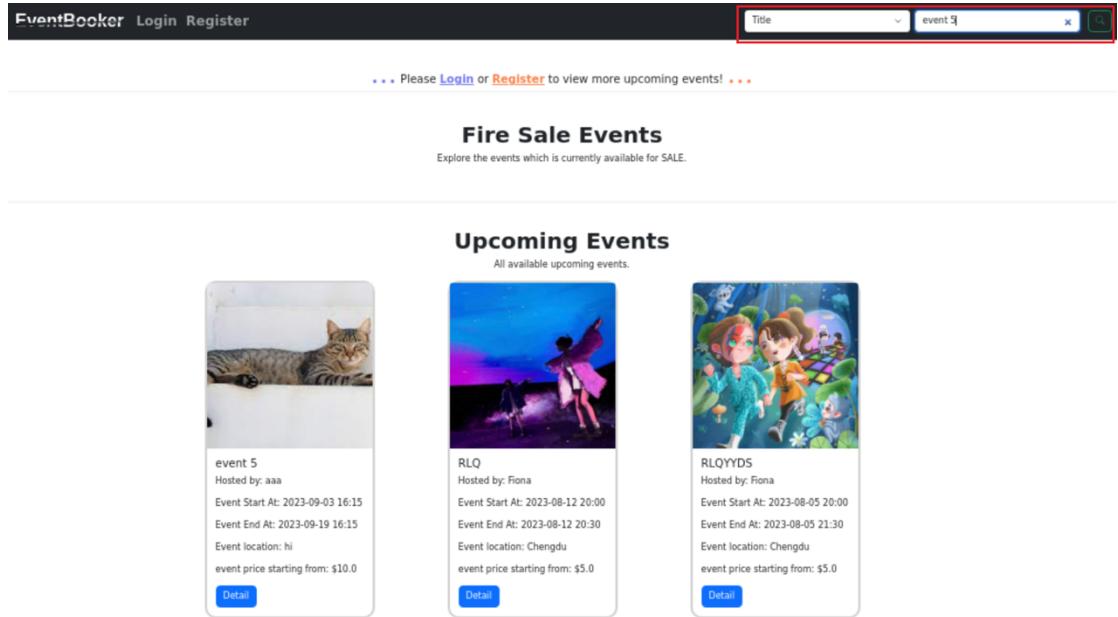


Fig 11. Home page for prospective users - search function

If you perform a search on the title, such as “event 5”, you will be asked to login first.

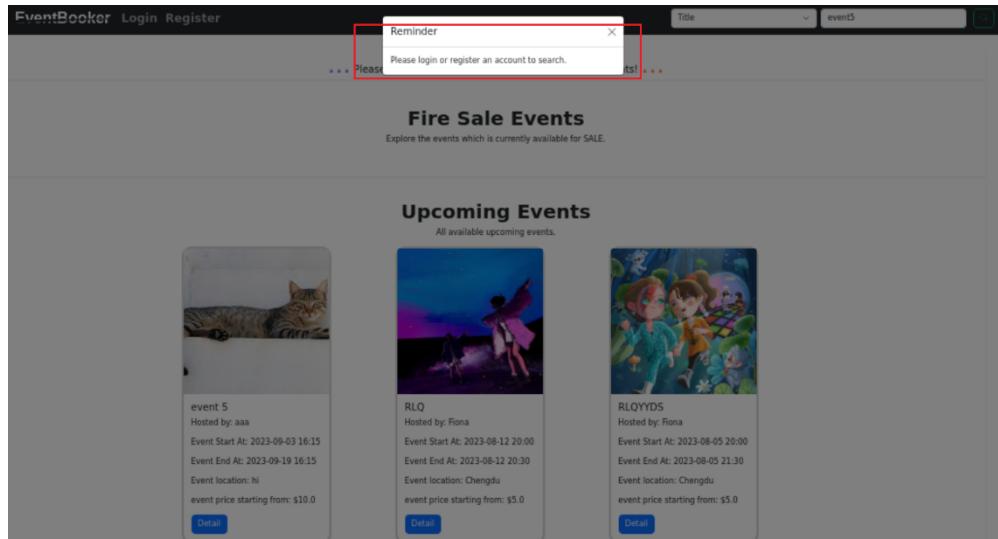


Fig 12. Home page for prospective users - warning message

6.2.2 Users

As a registered user, you can view all upcoming events, including all upcoming fire sale events, regardless of the availability of tickets.

6.2.2.1 Authentication

If you would like to experience extra features in this website, you can register a user account.

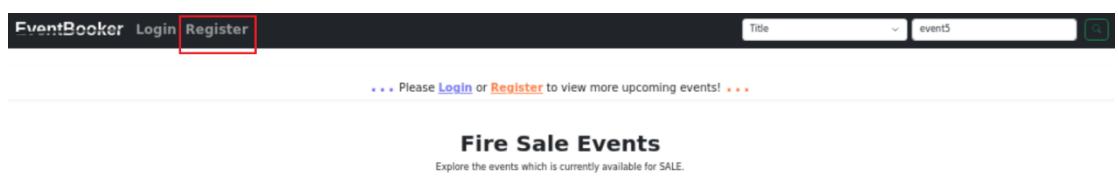
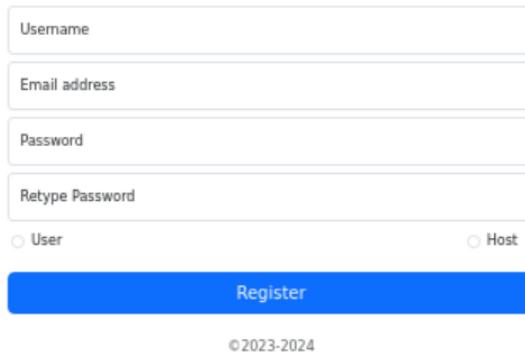


Fig 13. Home page - register



The image shows a registration form with four input fields: 'Username', 'Email address', 'Password', and 'Retype Password'. Below the fields are two radio buttons: 'User' (selected) and 'Host'. A large blue 'Register' button is at the bottom, and a copyright notice '© 2023-2024' is at the very bottom.

Fig 14. Register page

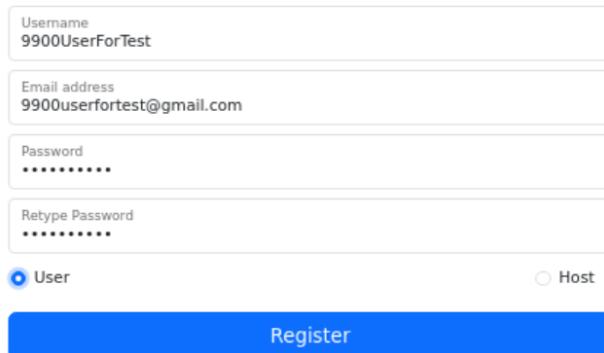
Please type in the information required. And it's advised to use a genuine **Google Email address** as you will need it to receive emails from the website.

If you do not have any genuine Google Email addresses, we've created one for testing purpose:

Email address: 9900userfortest@gmail.com

Password: Abc123456!

You can use this account to register on our website :)



The image shows a registration form with the following values entered: 'Username' is '9900UserForTest', 'Email address' is '9900userfortest@gmail.com', 'Password' and 'Retype Password' both show masked input (*****). The 'User' radio button is selected. A large blue 'Register' button is at the bottom, and a copyright notice '© 2023-2024' is at the very bottom.

Fig 15. Register page - as a User

After clicking the "Register" button, your user account will be created, and you will be led to the home page.

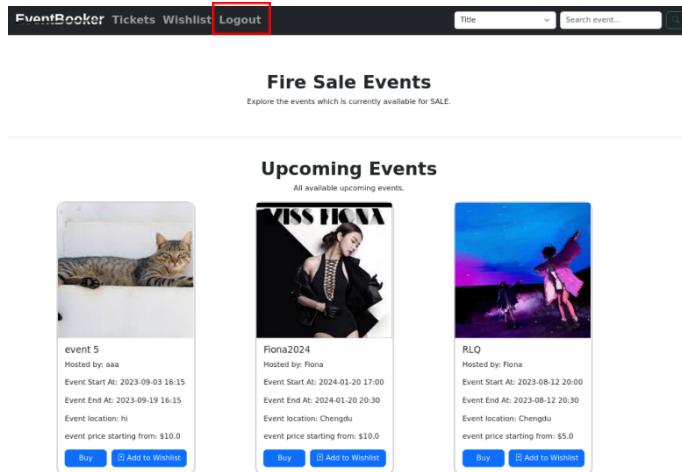


Fig 16. Home page - as a User

Now let's check if you can login with your new account. To do this, please click the "Logout" first. Next, click the "Login" button:

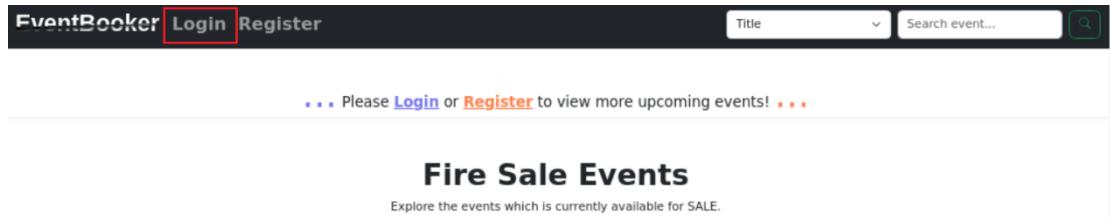


Fig 17. Home page

And input the Email address and password you've used before, i.e., 9900userfortest@gmail.com and Abc123456!

Fig 18. Login page

If you are led to the home page again, congratulations! You have a new user account on our website!

6.2.2.2 Search Events

As a user, you can use the event search functionality. To be more specific, you can search by title, start-date, and location.

By Title:

Choose the Title option and you can type the title that you would like to search for:

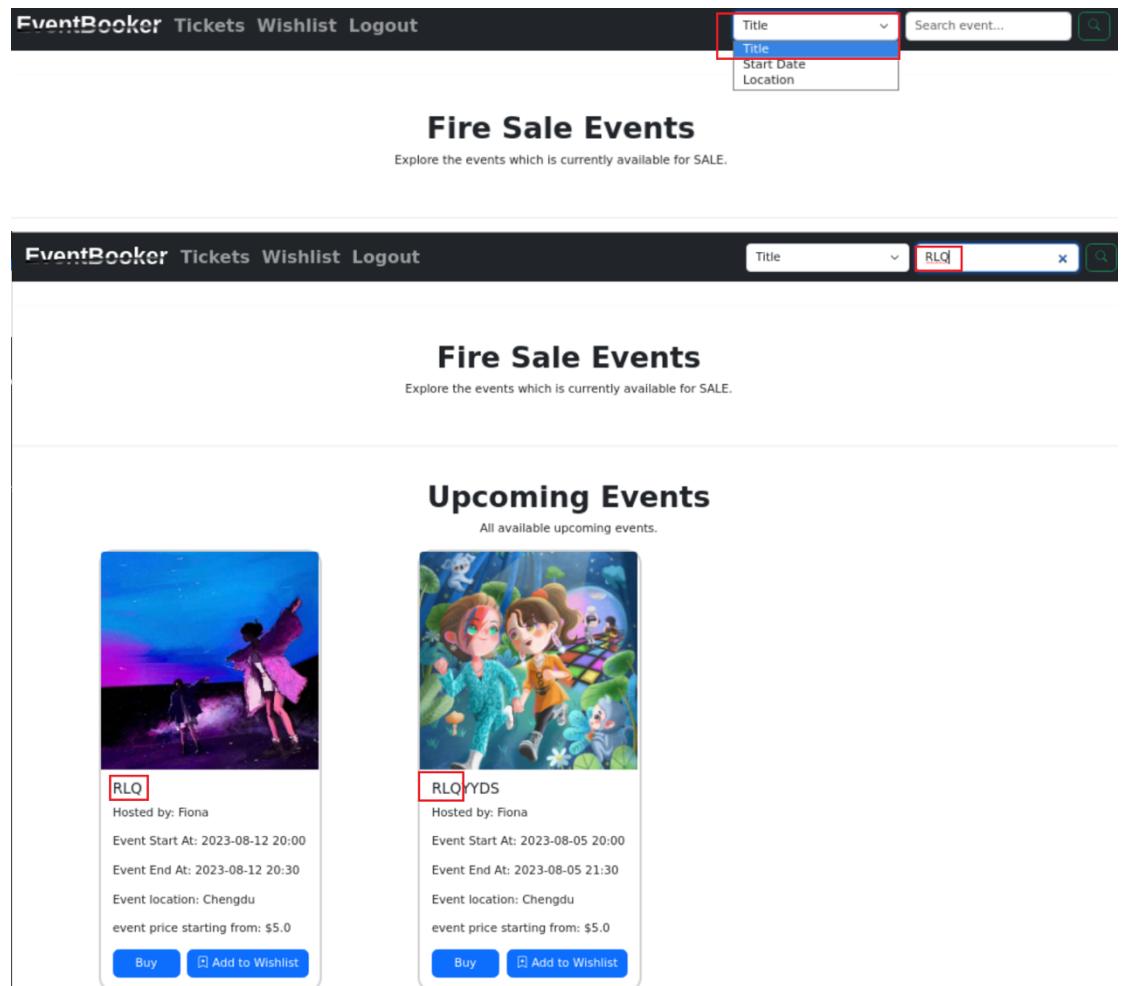
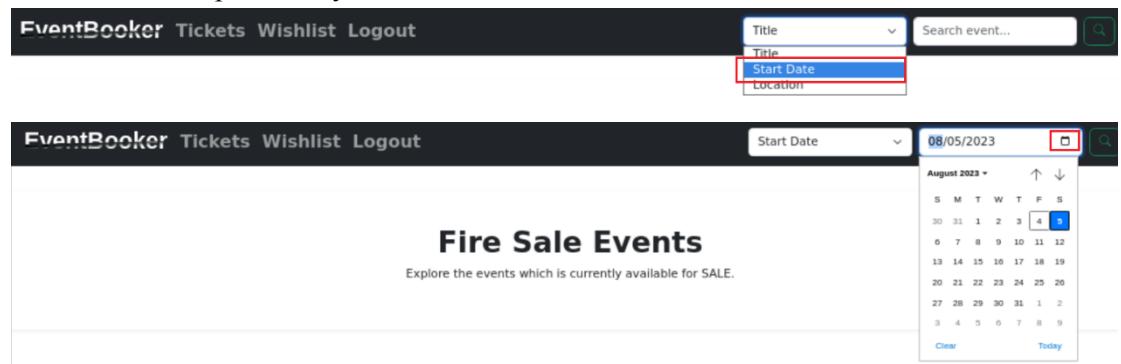


Fig 19. Search by title

By Start Date:

Choose the “Start Date” option and you can click the calendar icon to choose a date:



And click the “search” icon on the left:



Fig 20. Search by Start Date

The desired event will be filtered out:

The screenshot shows the EventBooker homepage with a search bar at the top. Below the search bar, there are two main sections: "Fire Sale Events" and "Upcoming Events". The "Upcoming Events" section is titled "Upcoming Events" and subtitle "All available upcoming events." It displays three event cards. The first event card, titled "RLQYYDS", has its start date, "Event Start At: 2023-08-05 20:00", highlighted with a red box. The other two events are "Fiona2024" and "RLQ". Each event card includes a thumbnail image, the event title, host information, start and end times, location, price, and two buttons: "Buy" and "Add to Wishlist".

Fig 21. Home page - search result of Start Date

By location:

This is the same as “By Title”, please follow the steps mentioned above.

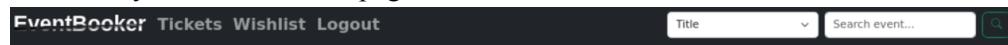
6.2.2.3 Wishlist

As a user, you can add any valid events into your wish list in the homepage.

The screenshot shows the EventBooker homepage with a search bar at the top. Below the search bar, there are two main sections: "Fire Sale Events" and "Upcoming Events". The "Upcoming Events" section is titled "Upcoming Events" and subtitle "All available upcoming events." It displays three event cards. The first event card, titled "event 5", has its "Add to Wishlist" button highlighted with a red box. The other two events are "Fiona2024" and "RLQ". Each event card includes a thumbnail image, the event title, host information, start and end times, location, price, and two buttons: "Buy" and "Add to Wishlist".

Fig 22. Home page - add to wishlist

After clicking the “Add to Wishlist” button, this event will be added to your Wishlist, and you can remove it at any time in the Homepage.



Fire Sale Events

Explore the events which is currently available for SALE.

Upcoming Events

All available upcoming events.

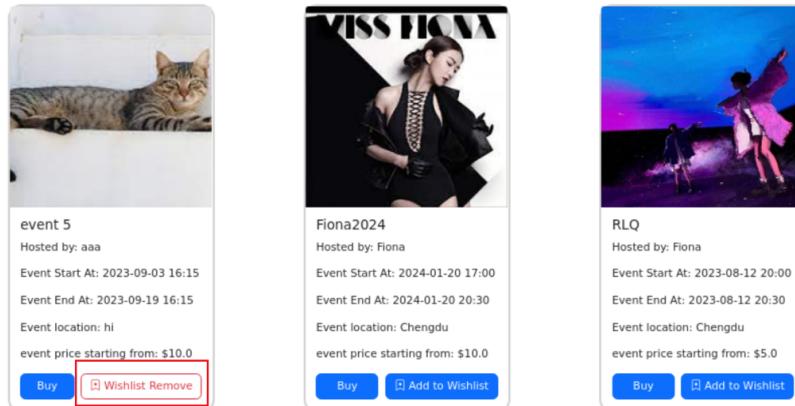


Fig 23. Home page - remove Wishlist

Besides, you can view your Wishlist by clicking the “Wishlist” button in the navigation bar:



Fig 24. Navigation bar - Wishlist

You can remove the event in your Wishlist as well:



wishlist

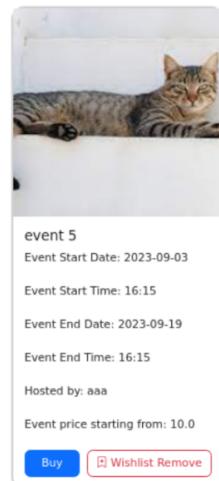


Fig 25. Wishlist page - remove wishlist

6.2.2.4 Tickets Buying

You can buy the tickets from any valid events by clicking the “Buy” button:

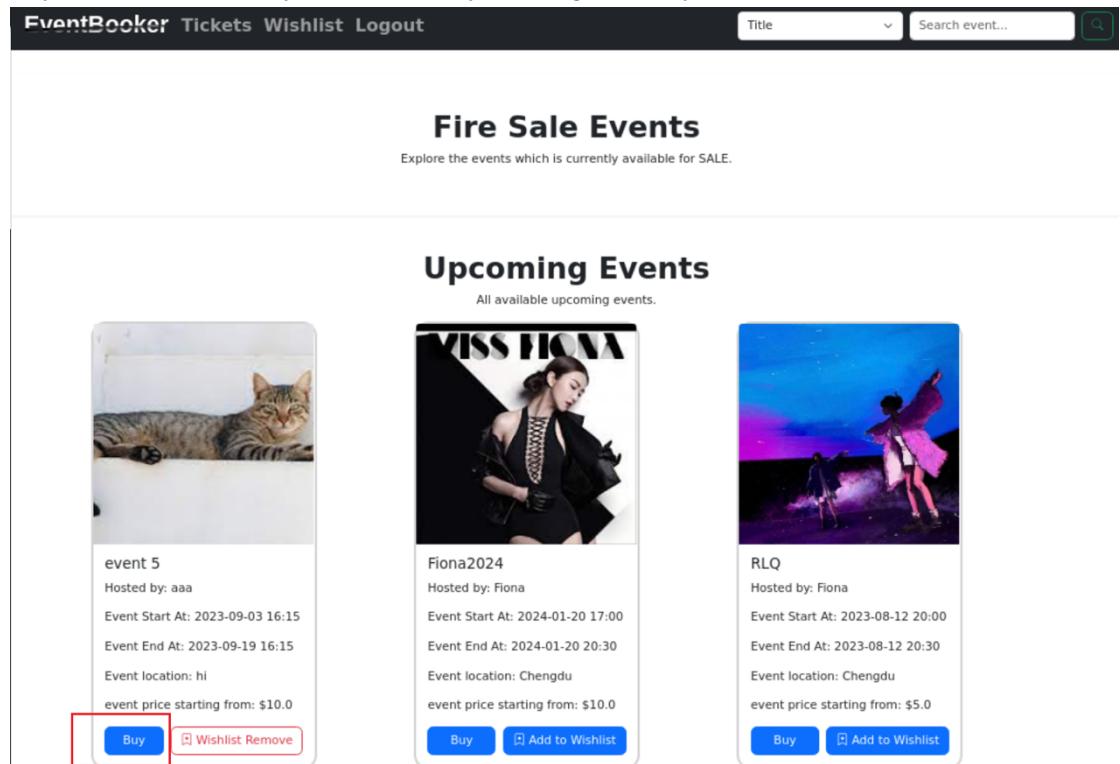


Fig 26. Home page - buy ticket

After clicking the button, you will be led to the purchasing page to select the desired seats:

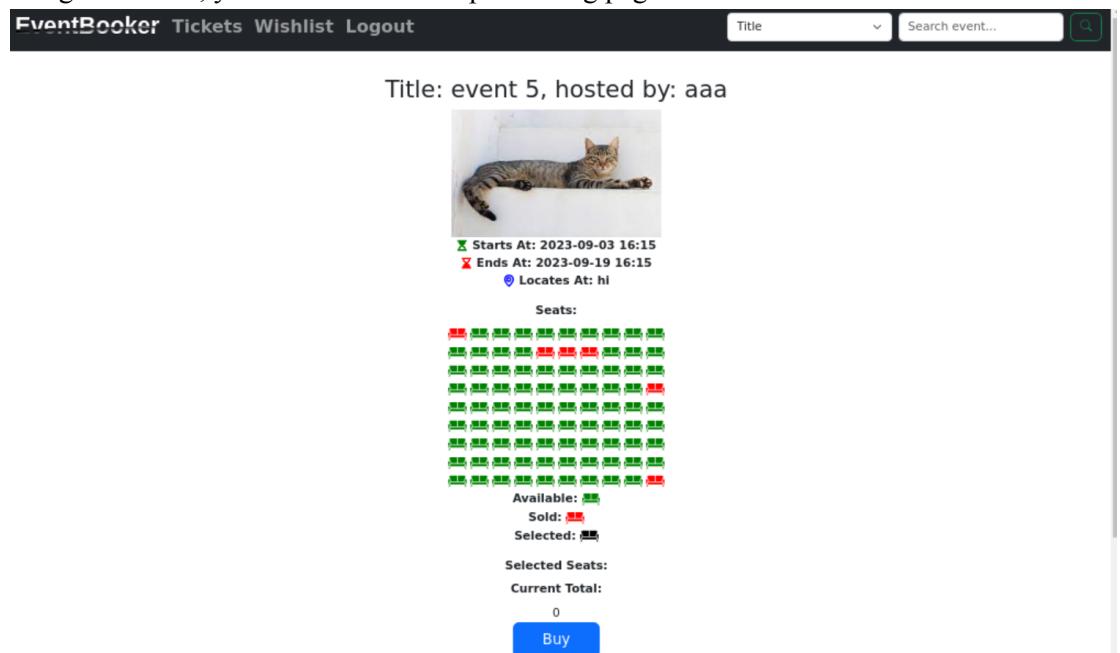


Fig 27. Event page

You can click any green seats (which are available) and view the selected seats and current total price at the below:

Title: event 5, hosted by: aaa



Fig 28. Event page - select seats

Furthermore, you can click the selected seats (which are in black) again to make them unselected.

Next, click the “Buy” button to continue your purchase, and you will be asked to input your payment information.

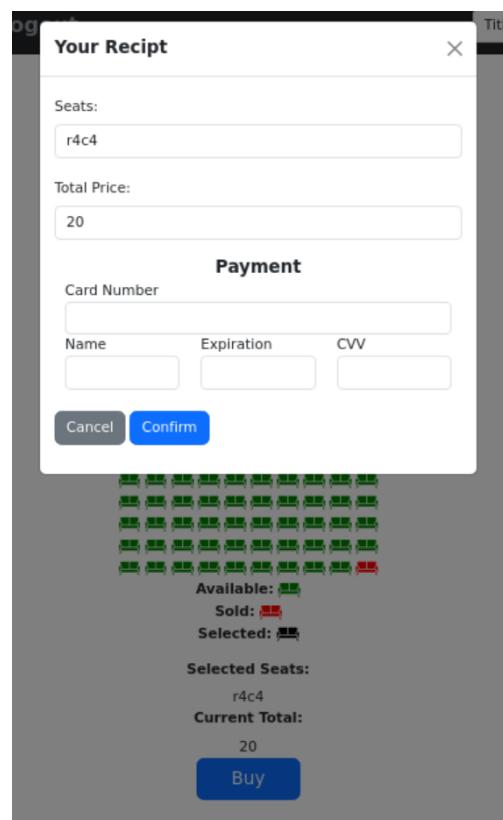


Fig 29. Buy ticket - confirm payment

The current “Payment” part is a pseudo one, so there is no need to worry about the correctness of your card information. And you can type in any information in this part.

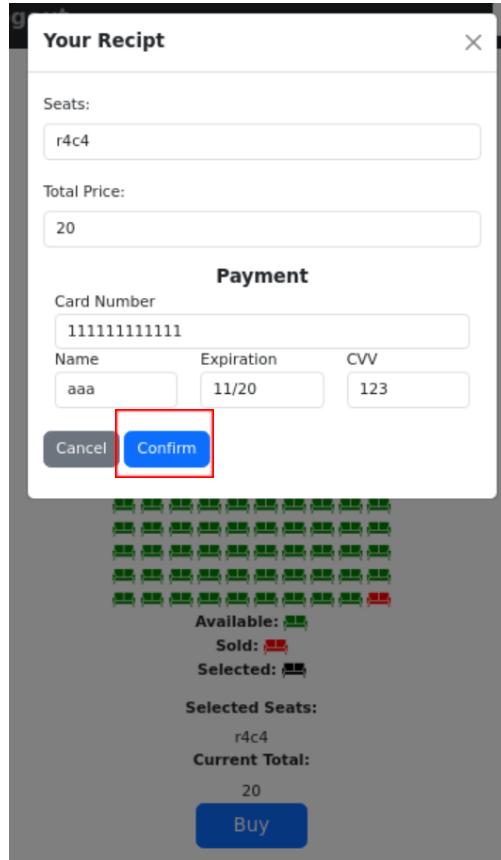


Fig 30. Buy ticket - filled in random payment details

And you can click the “Confirm” button to confirm your purchase, which may take a few seconds.

After the purchase is completed, you can check your email inbox (9900userfortest@gmail.com in this example) to find the confirmation email.

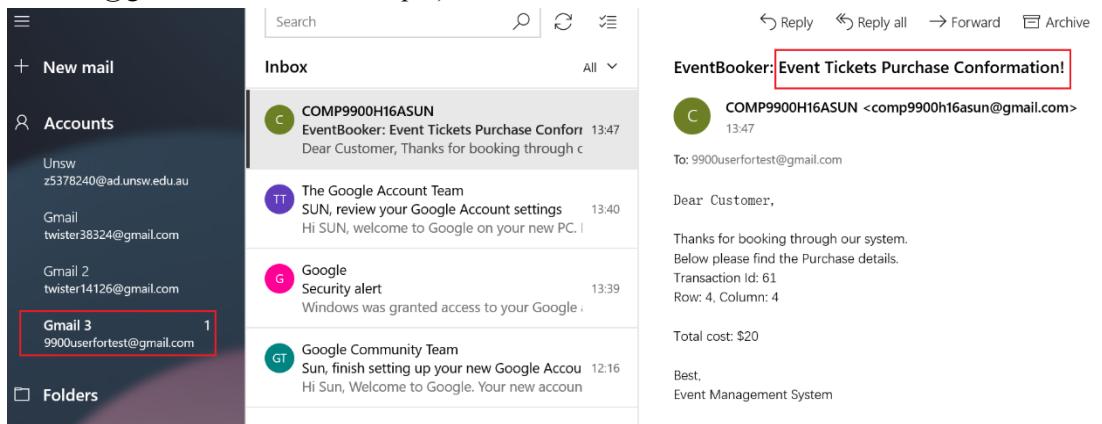


Fig 31. Email - Purchase Confirmation

At this moment, you can click the “Tickets” button in the navigation bar to check all your tickets:

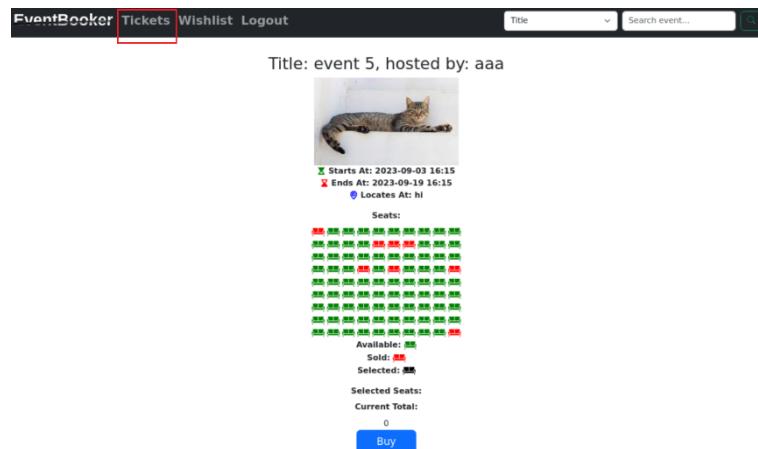


Fig 32. Check purchase records

You can find your purchase records in “Tickets”.

If you would like to cancel a ticket, just click the “Cancel” button:

The screenshot shows the 'My Tickets' section of the EventBooker Tickets page. A single ticket is listed for 'event 5' with details: Start Datetime ~ EndDatetime: 2023-09-03 16:15 ~ 2023-09-19 16:15, Row&Column: r4c4, Transaction Date: 2023-08-04, Price: 20\$. The 'Action' column contains a blue 'Cancel' button, which is highlighted with a red box. Below the table, a note states: 'Note: you cannot cancel a ticket due in 7 days.' Further down, sections for 'Cancelled Tickets' and 'Past Tickets' are visible.

Fig 33. Tickets page - cancel ticket

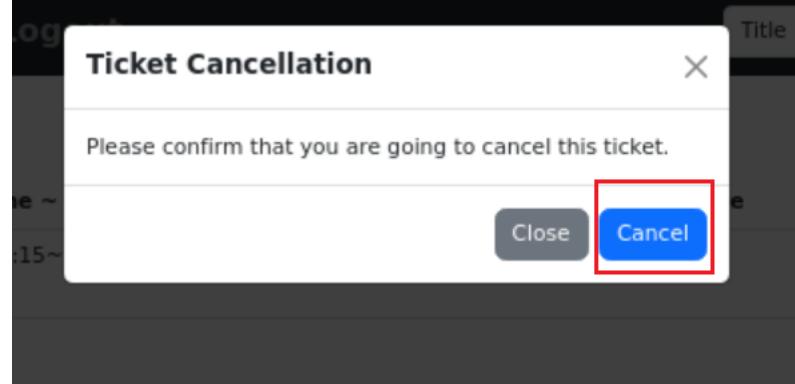


Fig 34. Tickets page - confirm ticket cancellation

And click the “Cancel” again to confirm. After a few seconds, your ticket will be canceled, and you will get the refund into your payment card.

My Tickets

Note: you cannot cancel a ticket due in 7 days.

Cancelled Tickets

Event Title	Start Datetime ~ EndDatetime	Row&Column	Transaction Date	Price	Action
event 5	2023-09-03 16:15~2023-09-19 16:15	r4c4	2023-08-04	20\$	Cancelled

Past Tickets

Fig 35. Tickets page - canceled tickets

Furthermore, you can also check your mailbox for the “Ticket Cancellation” email:

The screenshot shows a Gmail inbox with several messages. The top message is from 'EventBooker' with the subject 'Ticket Cancellation!'. The body of the email reads: 'Dear "9900UserForTest", The ticket for event "event 5" has been cancelled by you. The ticket you have booked will be refunded to your payment card.' Below this message are other emails from 'COMP9900H16ASUN', 'The Google Account Team', and 'Google Security alert'.

Fig 36. Email - Ticket cancellation

Note: you cannot cancel a ticket due in 7 days!

My Tickets

Event Title	Start Datetime ~ EndDatetime	Row&Column	Transaction Date	Price	Action
RLQYYDS	2023-08-05 20:00~2023-08-05 21:30	r2c3	2023-08-04	5\$	Cancel

Note: you cannot cancel a ticket due in 7 days.

cur date

Fig 37. Tickets page - cannot cancel a ticket due in 7 days

You will find the “Cancel” button is disabled in this case.

6.2.2.4 Comments

You can leave your comments on the events. To start, you can click the “Buy” button to see the comment part of the event:

Fire Sale Events
Explore the events which is currently available for SALE.

Upcoming Events
All available upcoming events.

- event 5**
Hosted by: aaa
Event Start At: 2023-09-03 16:15
Event End At: 2023-09-19 16:15
Event location: hi
event price starting from: \$10.0
Buy **Wishlist Remove**
- Fiona2024**
Hosted by: Fiona
Event Start At: 2024-01-20 17:00
Event End At: 2024-01-20 20:30
Event location: Chengdu
event price starting from: \$10.0
Buy **Add to Wishlist**
- RLQ**
Hosted by: Fiona
Event Start At: 2023-08-12 20:00
Event End At: 2023-08-12 20:30
Event location: Chengdu
event price starting from: \$5.0
Buy **Add to Wishlist**

Fig 38. Home page - leave comments

And you will find the comment part below the seat selection part:

Title: event 5, hosted by: aaa

Starts At: 2023-09-03 16:15
Ends At: 2023-09-19 16:15
Locates At: hi

Seats:

Available: 100
Sold: 0
Selected: 0

Selected Seats:
Current Total: 0
Buy

Comments:
Please input your comments!
Submit

WillChanUser2 2023-08-02, 11:58:23
replies email testing

Fig 39. Event page - comments

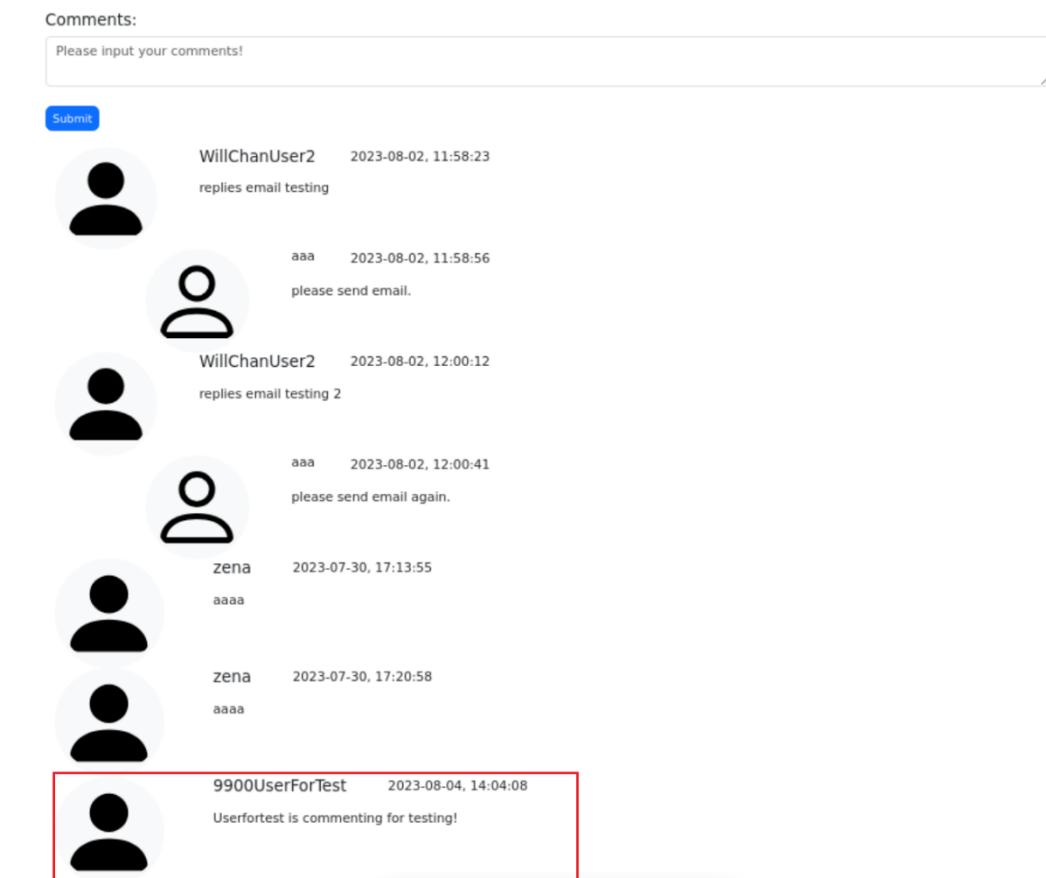
You can type in your comments in the text field, and click “Submit” button:

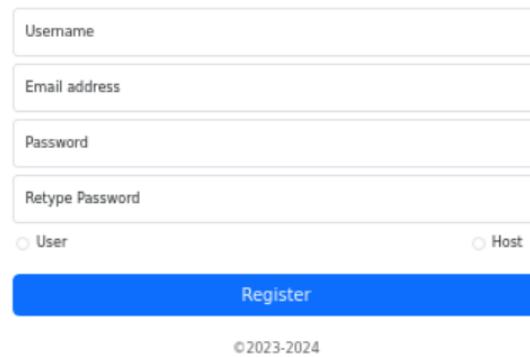
Comments:

Userfortest is commenting for testing!

Fig 40. Event page - posting comments

And after submitting, you can find your comment at the bottom:





The image shows a registration form with the following fields:

- Username:
- Email address:
- Password:
- Retype Password:
- User Host
- Register**

At the bottom right of the form area, there is a small text: ©2023-2024.

Fig 43. Register page

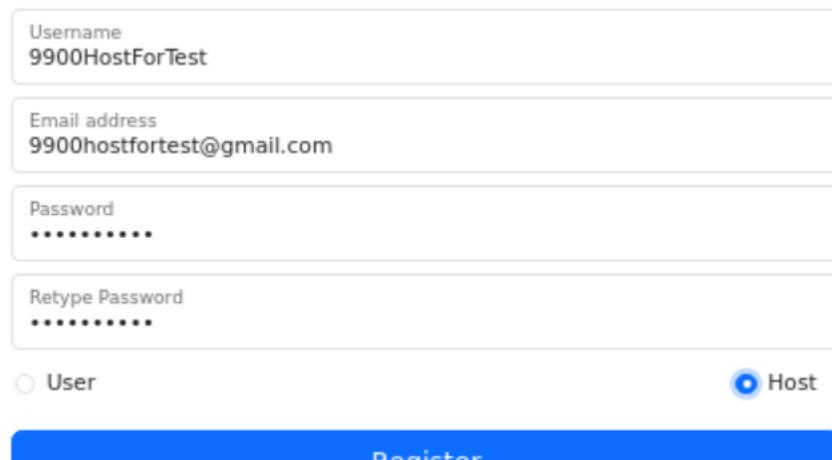
Please type in the information required. And it's advised to use a genuine **Google Email address** as you will need it to receive emails from the website.

If you do not have any genuine Google Email addresses, we'll provide you one:

Email address: 9900hostfortest@gmail.com

Password: Abc123456!

You can use this account to register on our website :)



The image shows a registration form with the following fields:

- Username: 9900HostForTest
- Email address: 9900hostfortest@gmail.com
- Password: *****
- Retype Password: *****
- User Host
- Register**

At the bottom right of the form area, there is a small text: ©2023-2024.

Fig 44. Register page - as a Host

After clicking the “Register” button, your host account will be created, and you will be led to the home page as a host.

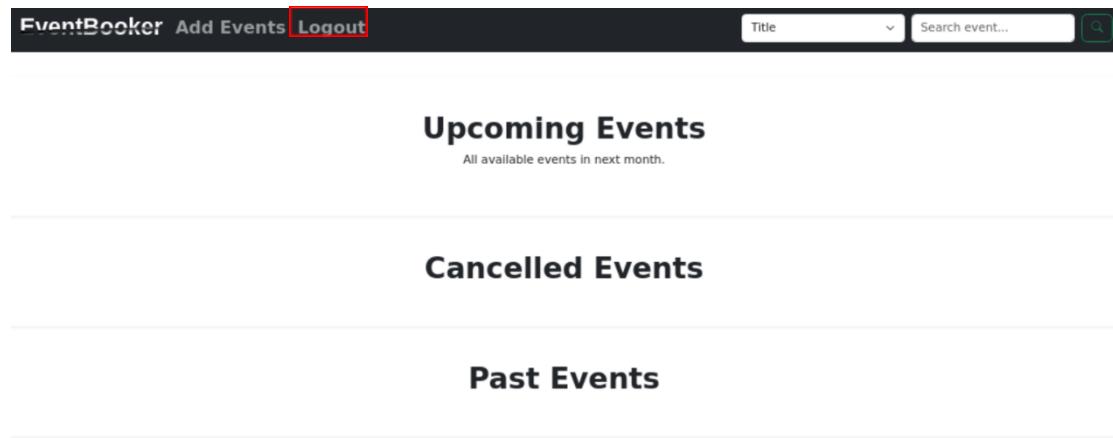


Fig 45. Home page - as a Host

Now let's check if you can login with your new account. To do this, please click the "Logout" first.

Next, click the "Login" button:

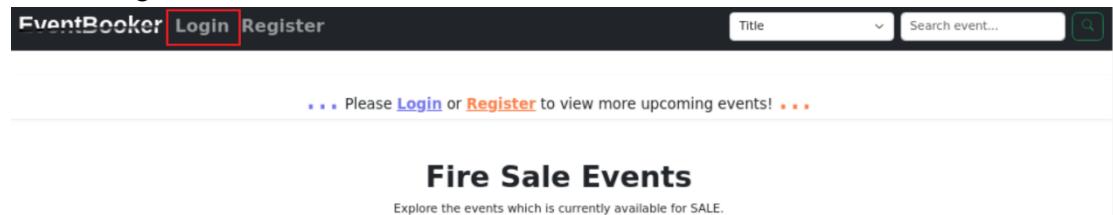


Fig 46. Home page

And input the Email address and password you've used before, i.e., 9900hostfortest@gmail.com and Abc123456!

Fig 47. Login page

If you are led to the home page again, congratulations! You have a new host account on our website!

6.2.3.2 Event Management

If you would like to post a new event, please click the "Add Events" button in the navigation bar:



Fig 48. Navigation bar - Add Events

And you will be led to the “Add Event” page:

Add Event

Event Title Test
Start Date&Time mm/dd/yyyy, --:-- -- <input style="float: right;" type="button" value="Choose"/>
End Date&Time mm/dd/yyyy, --:-- -- <input style="float: right;" type="button" value="Choose"/>
Location Mascot
Upload your poster
<input style="float: left; margin-right: 5px;" type="button" value="Choose File"/> cat.jpeg <input style="float: right;" type="button" value="Remove"/>
Choose a seat layout
<input type="radio"/> Layout-1 <input type="radio"/> Layout-2

Fig 49. Add Event page

Please fill in the required information:

Add Event

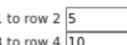
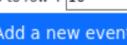
Event Title Test
Start Date&Time 08/11/2023, 02:38 PM <input style="float: right;" type="button" value="Choose"/>
End Date&Time 08/12/2023, 02:38 PM <input style="float: right;" type="button" value="Choose"/>
Location Mascot
Upload your poster
<input style="float: left; margin-right: 5px;" type="button" value="Choose File"/> cat.jpeg <input style="float: right;" type="button" value="Remove"/>
Choose a seat layout
<input checked="" type="radio"/> Layout-1 <input type="radio"/> Layout-2    
Price for row 1 to row 2 <input type="text" value="5"/> Price for row 3 to row 4 <input type="text" value="10"/>
<input style="width: 100%;" type="button" value="Add a new event"/>

Fig 50. Add Event Page - filled

Note: for the poster images, if you do not have any image currently, we have provided several images for you:

1. Click the “Choose File” button.
2. Find the “capstone-project-9900h16asun” folder and double click it.

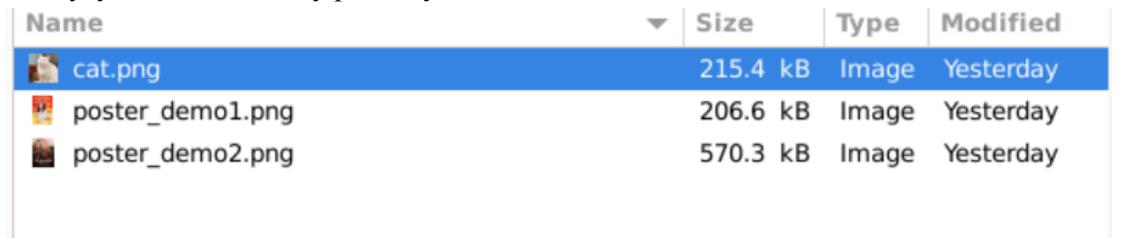
Name	Size	Type
 capstone-project-9900h16asun		

3. Double click the “project” folder.

4. Double click the “static” folder.



5. Finally, you can choose any picture you want.



After the input of the information, you can click the “Add a new event” button to post this event:

Add Event

Event Title Test
Start Date&Time 08/11/2023, 02:38 PM
End Date&Time 08/12/2023, 02:38 PM
Location Mascot
Upload your poster <input type="file"/> Choose File No file chosen
Choose a seat layout <input checked="" type="radio"/> Layout-1 <input type="radio"/> Layout-2 
Price for row 1 to row 2 <input type="text" value="5"/> Price for row 3 to row 4 <input type="text" value="10"/>
Add a new event

Fig 51. Add Event page - filled

You can find the newly added event in “All of my events”:

All of my events

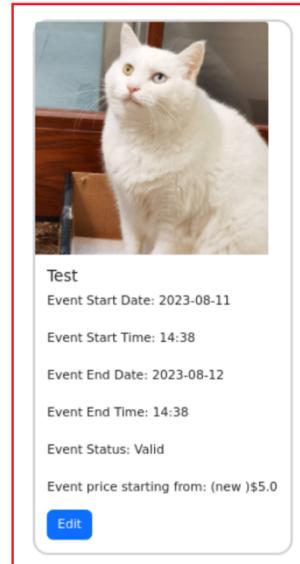


Fig 52. Add Event page - all of my events

To edit the event information, you can click the “edit” button in the “All of my events”:

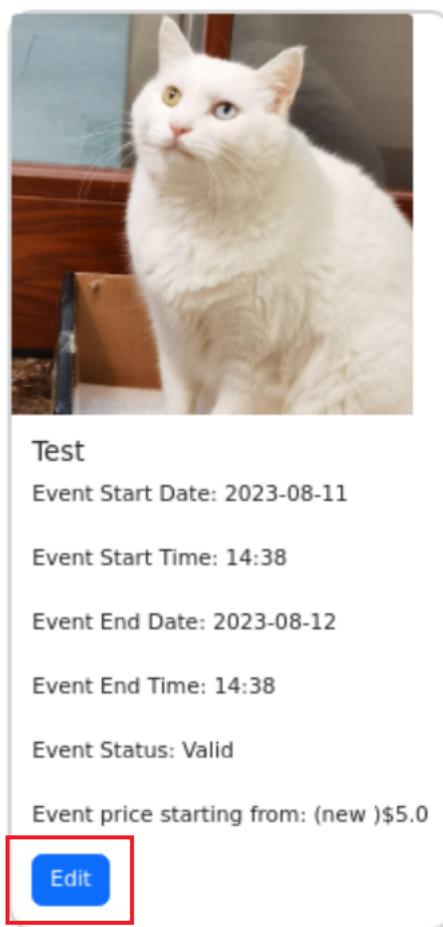


Fig 53. Add Event page - all of my events

Or in the home page:

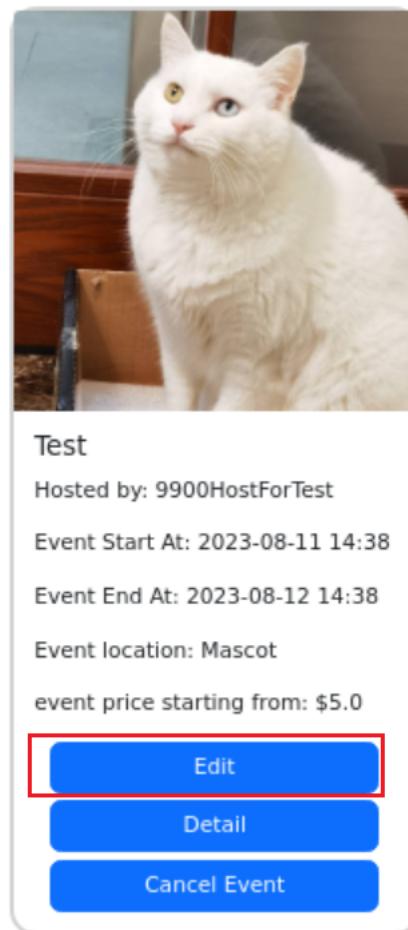


Fig 54. Home page - edit event

This will lead you to the “Edit” page. For example, you can edit the Location to “Sydney”:

Edit your Event

The image shows a form titled "Edit your Event". It contains four input fields. The first field is for "Event Title" with the value "Test". The second field is for "Start Date&Time" with the value "08/11/2023, 02:38 PM". The third field is for "End Date&Time" with the value "08/12/2023, 02:38 PM". The fourth field is for "Location" with the value "Sydney". A red rectangular box highlights the "Location" field, and a blue rectangular box highlights the entire row containing the "Location" field.

Fig 55. Edit page - change location of an event

And click the Confirm Edit button, the change will be updated.

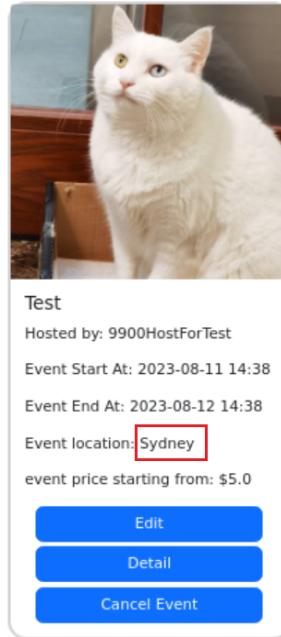


Fig 56. Home page - event after location update

Besides, users who have purchased tickets **for this event** (or have added this event into the wishlist) will receive an email telling them the updated information:

EventBooker: The event related to you has **NEW UPDATE**

Dear Customer,

The event "Test" has been updated by the host.

There are the new details:

- The Event Title: "Test".
- The StartDate: "2023-08-11".
- The StartTime: "14:38".
- The EndDate: "2023-08-12".
- The EndTime: "14:38".
- The Location "Sydney"**

Thanks for your attention!

Fig 57. Email - updated information for wishlist customer

To cancel an event, you can click the “Cancel Event” button in the home page:

Fig 58. Home page - cancel event

And please confirm the cancellation:

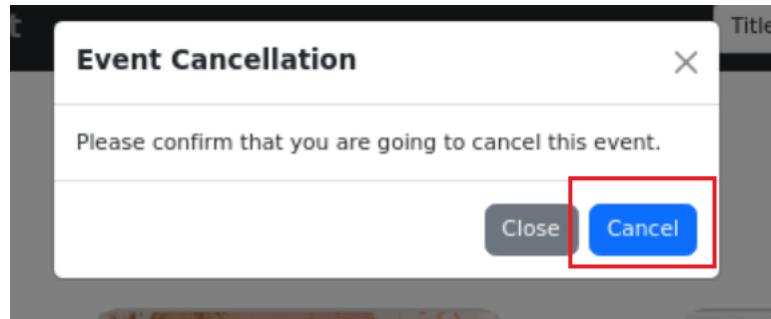


Fig 59. Pop up screen for confirming event cancellation

After a few seconds, this event will be canceled, and you can find it in the “Cancelled Events” part:

Fig 60. Home page - cancelled events for host

Furthermore, users who have bought tickets **for this event** (or have added this event into the wish list) will receive an email, which informs them the cancellation of the event:

Fig 61. Email - cancellation email to ticket holders

The screenshot shows an email inbox with the following messages:

- COMP9900H16ASUN** EventBooker: Your wishlist events have NEW L 15:15 Dear Customer, The event "Test" has been can
- COMP9900H16ASUN** EventBooker: Event Cancellation! 15:15 Dear Customer, The event "Test" has been can
- COMP9900H16ASUN** EventBooker: The event related to you has NE 15:10 Dear Customer, The event "Test" has been upc
- COMP9900H16ASUN** > EventBooker: Event Tickets Purchase Confor 15:08 Dear Customer, Thanks for booking through c

Fig 62. Email - cancellation email to wishlist customers

As a host, you can also use the Event Search functionality for all the events created by you (and the procedure is the same as the user search):

The screenshot shows the EventBooker home page with two sections:

Upcoming Events

All available events in next month.

Event ID	Event Name	Hosted by	Event Start At	Event End At	Event location	Event price starting from	Action Buttons
d	杭州西湖	9900HostForTest	2023-08-12 14:48	2023-08-26 14:48	t	\$5.0	Edit Detail Cancel Event
t	Cat	9900HostForTest	2023-08-18 14:59	2023-08-25 14:59	m	\$5.0	Edit Detail Cancel Event

Cancelled Events

All available events in next month.

Event ID	Event Name	Hosted by	Event Start At	Event End At	Event location	Event price starting from	Action Buttons
Test	Cat	9900HostForTest	2023-08-11 14:38	2023-08-12 14:38	Sydney	\$5.0	Edit Detail Cancel Event

Fig 63. Home page - search result for Host

Finally, you can set an event as a fire sale by clicking the “Edit” button:



Fig 64. Home page - Edit event

This will lead you to the “Edit” page, and you can find the “Fire Sale” part at the bottom:



Fig 65. Edit page - Fire Sale

You can change the prices as you wish and click the “Fire Sales!” button:

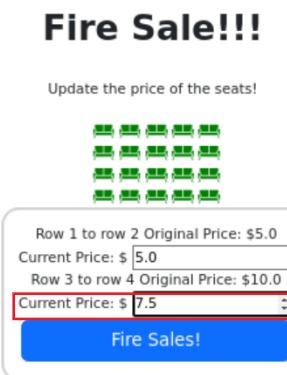


Fig 66. Edit page - update price using Fire Sale

And if you login as a **user**, you can find that this event is labeled as “fire sale”:

The screenshot shows the EventBooker homepage for a user. At the top, there is a navigation bar with links: EventBooker, Tickets (which is highlighted with a red box), Wishlist, and Logout. To the right of the navigation bar are search fields for 'Title' and 'Search event...' with a magnifying glass icon.

The main content area has a title 'Fire Sale Events' and a subtitle 'Explore the events which is currently available for SALE.' Below this, there are two event cards. The first event card on the left is for 'Mr. Miss 2022 梦幻小姐' with the title '枕边狂想曲' (BEDSIDE FUGUE). It shows a photo of a man and a woman in a tropical setting. The event details are: Hosted by: 9900HostForTest, Event Start At: 2023-08-12 14:48, Event End At: 2023-08-26 14:48, Event location: t, and event price starting from: \$5.0. There are 'Buy' and 'Add to Wishlist' buttons. A red box surrounds the entire event card. To the right of the first card is a note: 'Note: This is the homepage for a user!' in red text.

Fig 67. Home page - as a User - Fire Sale events

Or as a prospective customer, you can also find the “fire sale” events:

The screenshot shows the EventBooker homepage for a prospective customer. At the top, there is a navigation bar with links: EventBooker, Login, Register, Title, and Search event... with a magnifying glass icon. Below the navigation bar is a message: '... Please [Login](#) or [Register](#) to view more upcoming events! ...'

The main content area has a title 'Fire Sale Events' and a subtitle 'Explore the events which is currently available for SALE.' Below this, there are two event cards. The first event card on the left is for 'Mr. Miss 2022 梦幻小姐' with the title '枕边狂想曲' (BEDSIDE FUGUE). It shows a photo of a man and a woman in a tropical setting. The event details are: Hosted by: 9900HostForTest, Event Start At: 2023-08-12 14:48, Event End At: 2023-08-26 14:48, Event location: t, and event price starting from: \$5.0. There is a 'Detail' button. To the right of the first card is a note: 'This is the homepage for a prospective customer!' in red text. The second event card on the right shows a photo of a cat lying down. The event details are: Hosted by: 9900HostForTest, Event Start At: 2023-08-18 14:59, Event End At: 2023-08-25 14:59, Event location: m, and event price starting from: \$5.0. There is a 'Detail' button.

Fig 68. Home page - as a prospective customer - Fire Sale events

Besides, users who have added this event into the wish list will receive an email telling them that this event is on the fire sale:

The screenshot shows an email inbox with several messages. On the left, there is a sidebar with links: + New mail, Accounts, and a list of accounts including Unsw, Gmail, Gmail 2, Gmail 3, and Gmail 4. The main area shows an inbox with the following messages:

- EventBooker: Fire Sales!**: The event in your wishlist is on sale!

Dear Customer,
The price of the event "event 5" has been updated by the host.
Below please find the updated price:
Row 1 to row 3: \$0.0
Row 4 to row 6: \$0.0
Row 7 to row 9: \$1
Thanks for your attention!
- EventBooker: Fire Sales!**: Your wishlist events have NEW L

Dear Customer, The event "Test" has been car...
- EventBooker: Event Cancellation!**

Dear Customer, The event "Test" has been car...
- EventBooker: The event related to you has NE**

Dear Customer, The event "Test" has been up...
- EventBooker: Fire Sales!**: The event in your wishlist is on sale!

Dear Customer,

Fig 69. Email - Fire Sale notification to wishlist customer

6.2.3.3 Comments

You can reply to any comments in the events hosted by you. To start with, you can click the “Detail” button:

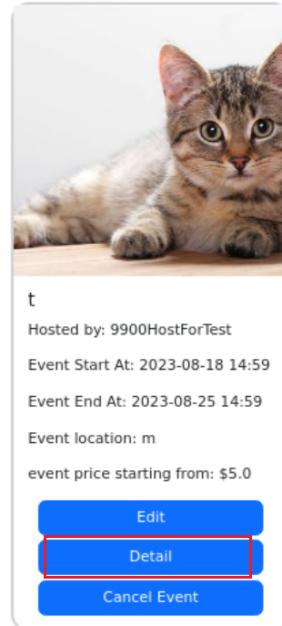


Fig 70. Home page - Detail

And you can click the “Reply” button:

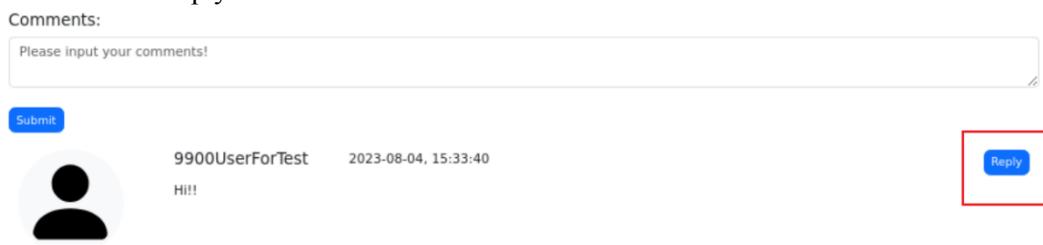


Fig Event page - open the reply text box

And you can type in some comments to reply:



Fig 71. Event page - posting reply

You can see your reply, and the “Reply” button for this comment will disappear, for we just want the host to reply once for each comment:

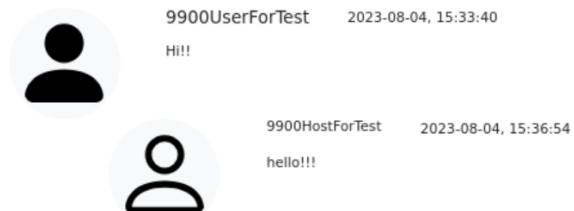


Fig 72. Event page - after posting reply

That's all for the Host part, hope you enjoy using our website :)

7. Reference

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<https://getbootstrap.com/docs/5.3/getting-started/introduction/>

Flask. (2023) *Flask's documentation*. Retrieved from
<https://flask.palletsprojects.com/en/2.3.x/>

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