

# 数据库引论 项目报告

## 机票预订系统

课程名称：数据库引论

课程代码：COMP130010.02

姓 名：栗菲

学 号：14300180038

专 业：数学类

## 1 基本信息

项目名称：机票预订系统

作者：14300180038 栗菲

编写时间：2016 年 6 月

运行系统：Ubuntu 14.04 LTS

数据库系统：MySQL 5.5.49

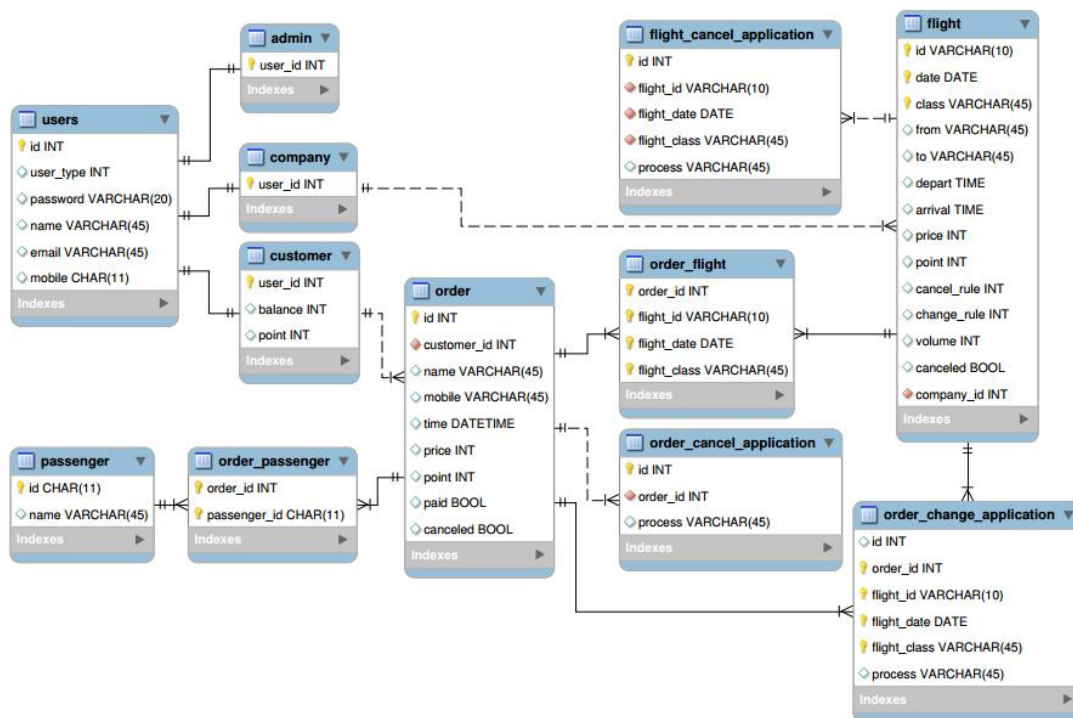
前端语言：HTML JavaScript CSS

后端语言：Python

UI：Daemonite's Material UI

运行环境：安装了 Python Flask 库和 MySQL Sever 的 Ubuntu 系统

## 2 数据库 ER 图



## 3 程序结构及代码说明

- 项目根目录下的 FeiFlight.py 是后端主程序，使用了 Flask 库来实现网站框架构建。
- static 和 assets 文件夹存储了项目所需要的 JavaScript 程序和 CSS 程序，其中大部分为 UI 自带。
- database 文件夹存储了项目所用数据库的 FeiFlight.sql 文件，还有数据生成程序 data\_gen.py。

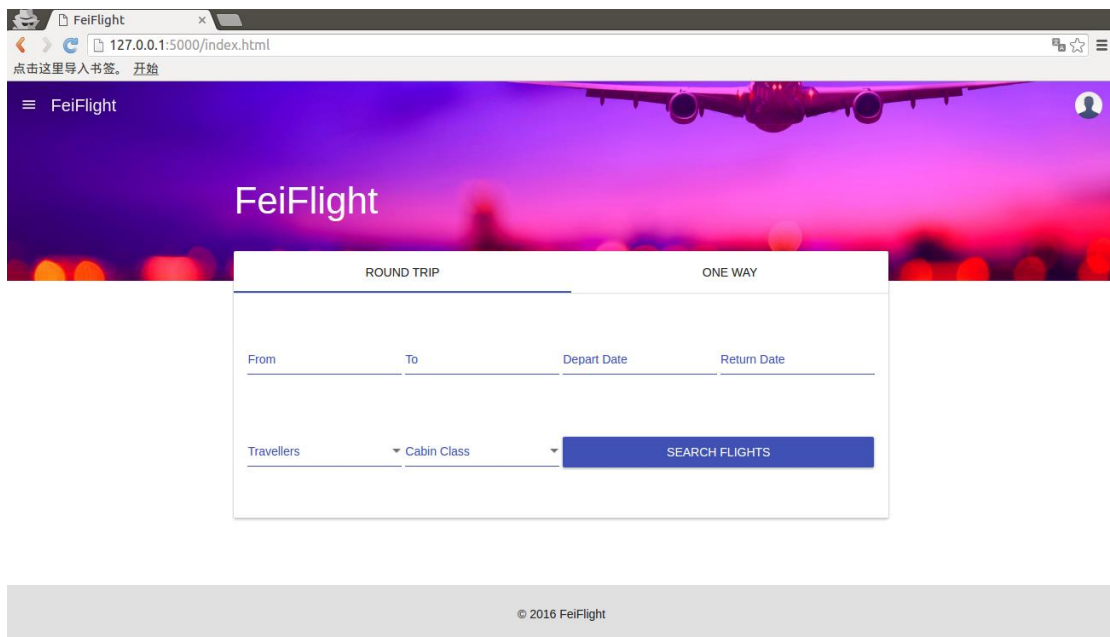
- templates 文件夹存储了所有 HTML 文件，具体为：
  - ◆ index.html 项目主页，用于搜索机票
  - ◆ sign-up.html 用户注册页面
  - ◆ login.html 用户登录页面
  - ◆ profile.html 用户基本信息页面，可修改个人资料
  - ◆ my-trips.html 用户账户信息及订单列表页面
  - ◆ order.html 订单详细信息及状态页面
  - ◆ company-portal.html 航空公司控制面板
  - ◆ flight.html 航班详细信息及状态页面
  - ◆ admin-portal.html 管理员控制面板
  - ◆ user-orders.html 管理员所查询用户的订单列表
  - ◆ about-us.html 项目信息页面

## 4 功能演示

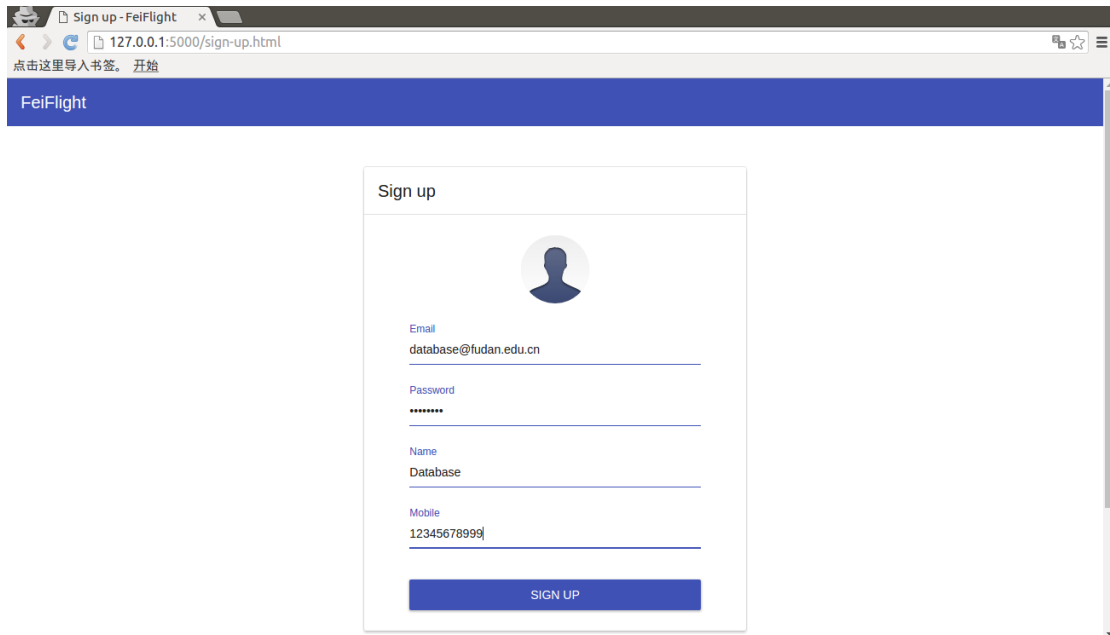
- 运行 FeiFlight.py。

```
lifei@lifei-ThinkPad-X220: ~/Database16/Project/FeiFlight
lifei@lifei-ThinkPad-X220:~$ cd Database16/Project/FeiFlight
lifei@lifei-ThinkPad-X220:~/Database16/Project/FeiFlight$ python FeiFlight.py
* Running on http://127.0.0.1:5000/ (Press CTRL+C to quit)
```

- 在浏览器中打开主页 127.0.0.1:5000/index.html

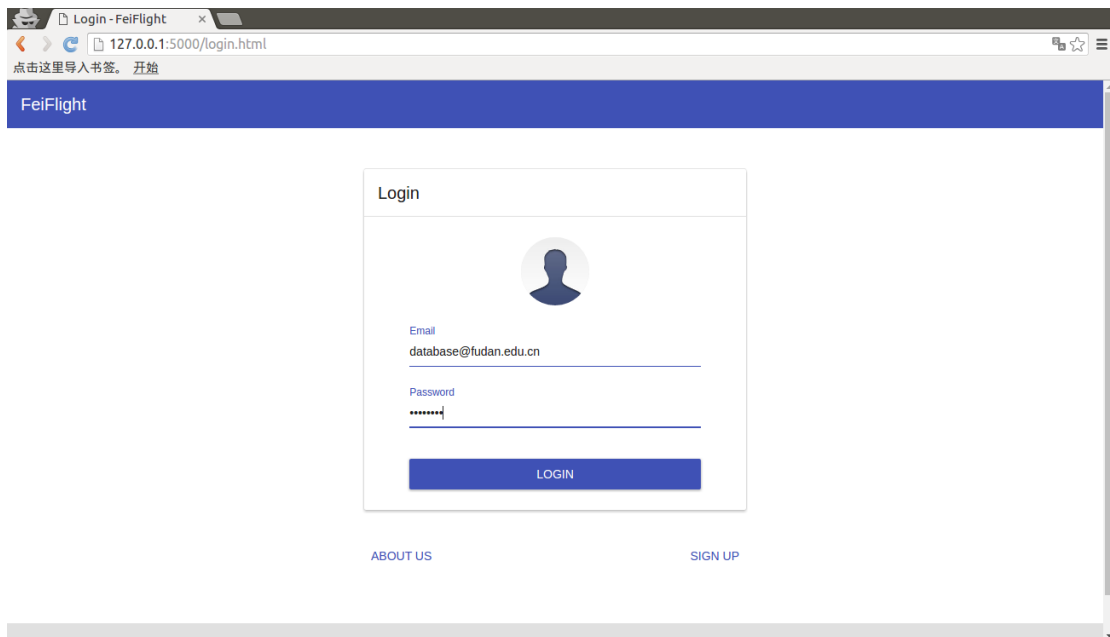


- 点击主页右上角头像弹出导航下拉框，点击 Sign up 按钮跳转至注册页面，输入个人信息注册为用户。



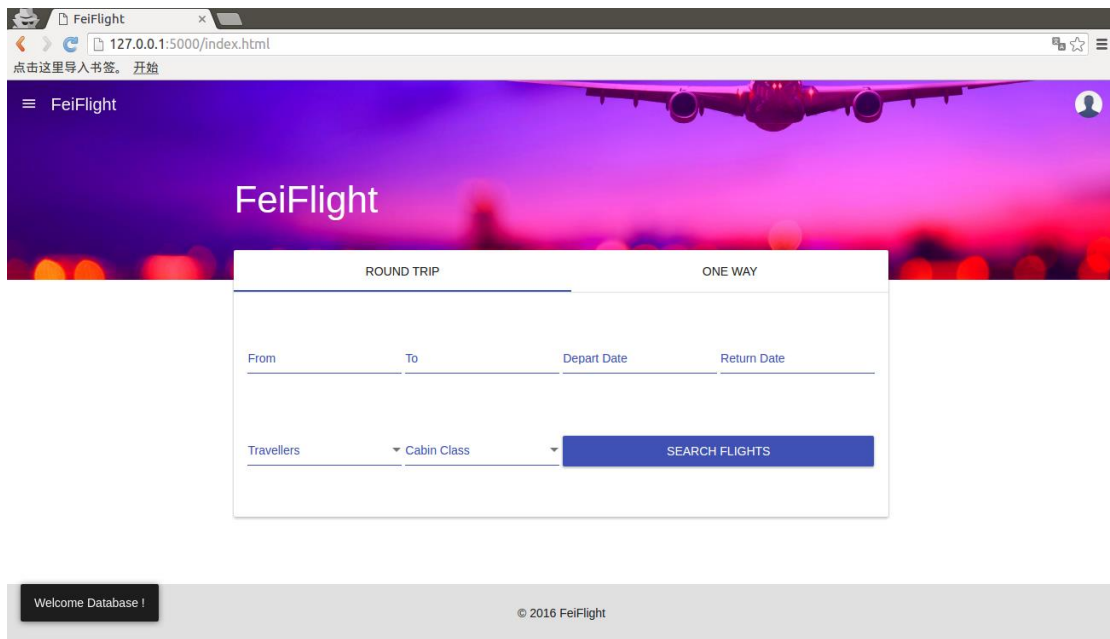
The screenshot shows a web browser window with the title "Sign up - FeiFlight". The address bar shows the URL "127.0.0.1:5000/sign-up.html". The page has a blue header with the text "FeiFlight". Below the header, there is a "Sign up" form. The form includes a profile picture placeholder, and input fields for "Email" (containing "database@fudan.edu.cn"), "Password" (containing "\*\*\*\*\*"), "Name" (containing "Database"), and "Mobile" (containing "12345678999"). A blue "SIGN UP" button is at the bottom of the form.

- 同样在右上角导航下拉框中可点击 Login 按钮跳转至登录界面，输入注册邮箱和密码登录。

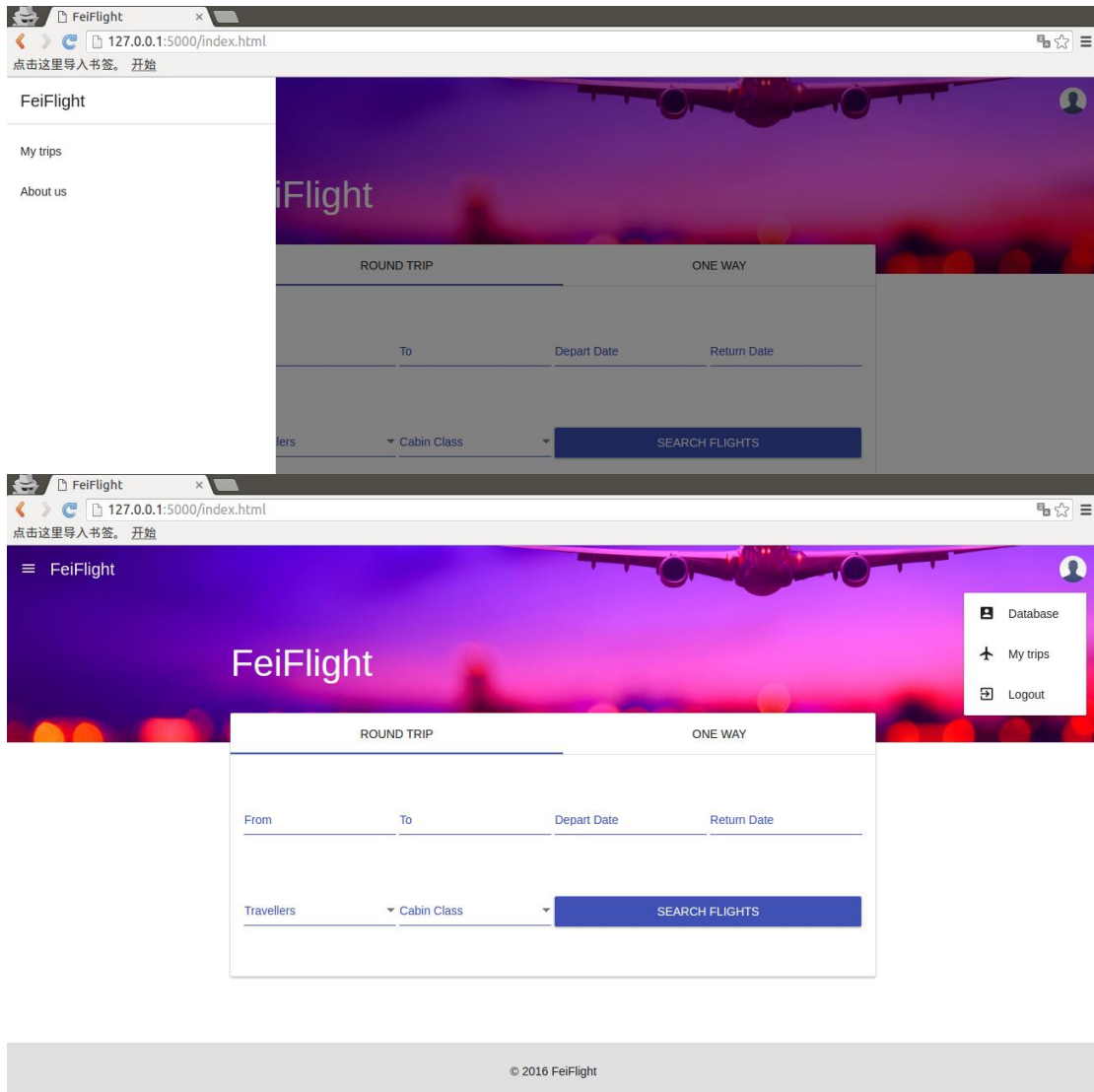


The screenshot shows a web browser window with the title "Login - FeiFlight". The address bar shows the URL "127.0.0.1:5000/login.html". The page has a blue header with the text "FeiFlight". Below the header, there is a "Login" form. The form includes a profile picture placeholder, and input fields for "Email" (containing "database@fudan.edu.cn") and "Password" (containing "\*\*\*\*\*"). A blue "LOGIN" button is at the bottom of the form. At the bottom of the page, there are two links: "ABOUT US" and "SIGN UP".

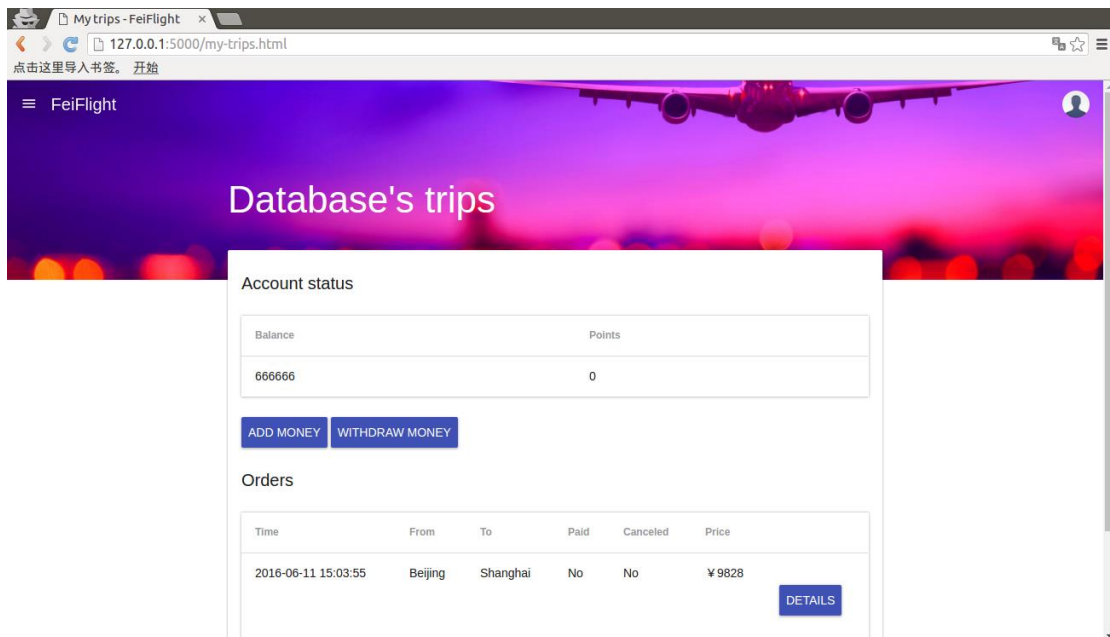
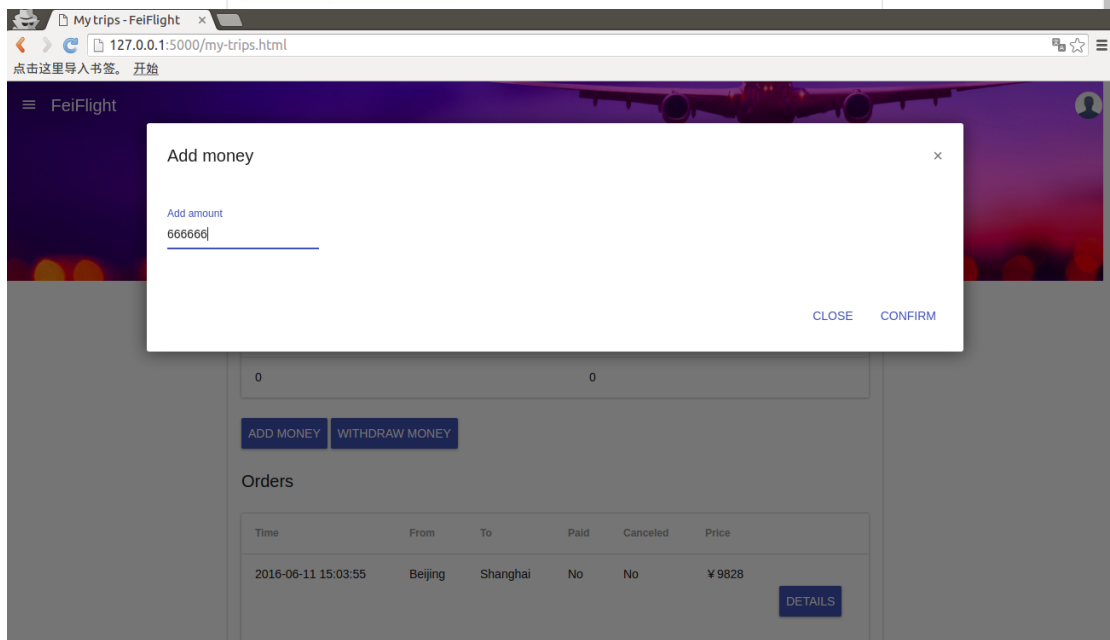
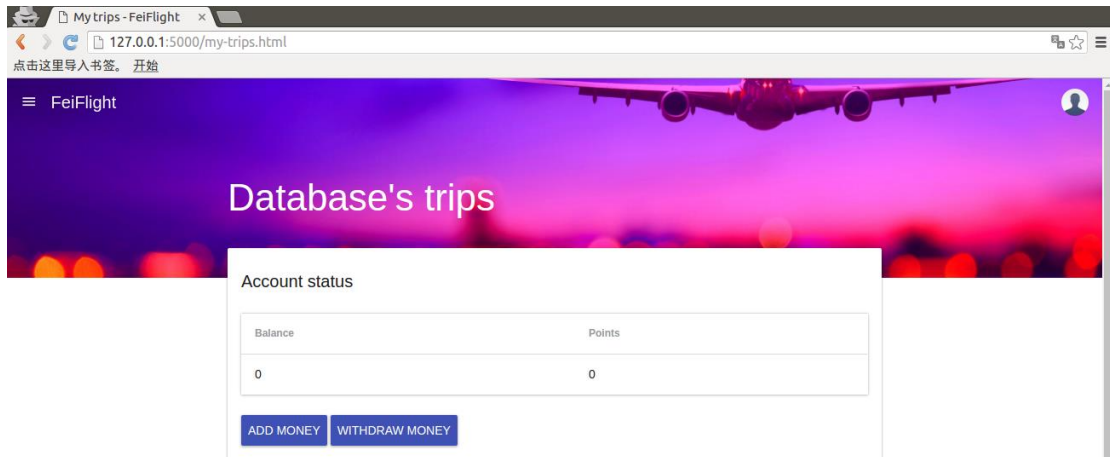
- 登陆成功，左下角弹出提示框。



- 网站有左右 2 个导航栏



- 在右上角点击 My trips 进入用户账户信息，可进行充值和提现。



- 在首页可搜索往返机票和单程机票，输入起降地、日期、乘客数和仓位等级查询，此处使用 AJAX 来显示查询结果。

Shanghai Beijing 18/Jun/2016 30/Jun/2016

Travellers: 2 Cabin Class: First Class SEARCH FLIGHTS

Airline	Flight	Date	Depart	Time	Arrival	Time	Price
Hasi	HA237	2016-06-18	Shanghai	20:20	Beijing	22:15	¥2487
Emirates	EK667	2016-06-30	Beijing	14:10	Shanghai	16:05	¥2372
							¥4859
ORDER							
Emirates	EK668	2016-06-18	Shanghai	18:50	Beijing	20:45	¥2542
Emirates	EK667	2016-06-30	Beijing	14:10	Shanghai	16:05	¥2372
							¥4914
ORDER							
Emirates	EK666	2016-06-18	Shanghai	10:20	Beijing	12:15	¥2592

- 点击要购买的机票的 order 按钮，在弹出的对话框中输入乘客信息，再点击 order 下订单。

Passenger Info

Name ID

Alice 11111

Name ID

Bob 22222

CLOSE ORDER

Airline	Flight	Date	Depart	Time	Arrival	Time	Price
Hasi	HA237	2016-06-18	Shanghai	20:20	Beijing	22:15	2372/ ¥114/ ¥46/First Class ¥2487
Emirates	EK667	2016-06-30	Beijing	14:10	Shanghai	16:05	2644/ ¥102/ ¥55/First Class ¥2372
							¥4859

- 跳转到订单详细信息页面。

Order - FeiFlight

127.0.0.1:5000/order.html

点击这里导入书签。 开始

FeiFlight

Order #49

Flight Info

Airline	Flight	Class	Date	From	Time	To	Time	Point/Cancel/Change	Price per person
Hasi	HA237	First Class	2016-06-18	Shanghai	20:20	Beijing	22:15	2372/¥ 114/¥ 46	¥ 2487
Emirates	EK667	First Class	2016-06-30	Beijing	14:10	Shanghai	16:05	2644/¥ 102/¥ 55	¥ 2372

Passenger Info

Name	ID
Alice	11111
Bob	22222

- 下拉到底部点击 Pay now 支付订单。

Order - FeiFlight

127.0.0.1:5000/order.html

点击这里导入书签。 开始

FeiFlight

Passenger Info

Name	ID
Alice	11111
Bob	22222

Order Info

Name	Mobile	Point	Price	Time	Paid	Canceled
Database	12345678999	10032	¥ 9718	2016-06-11 15:10:45	No	No

PAY NOW

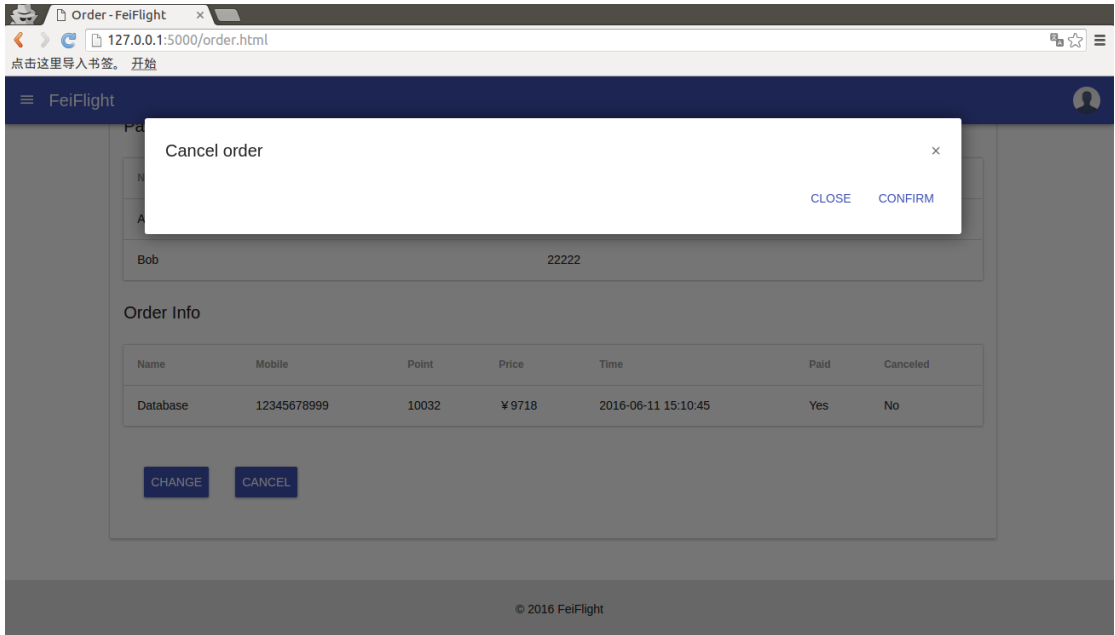
CHANGE

CANCEL

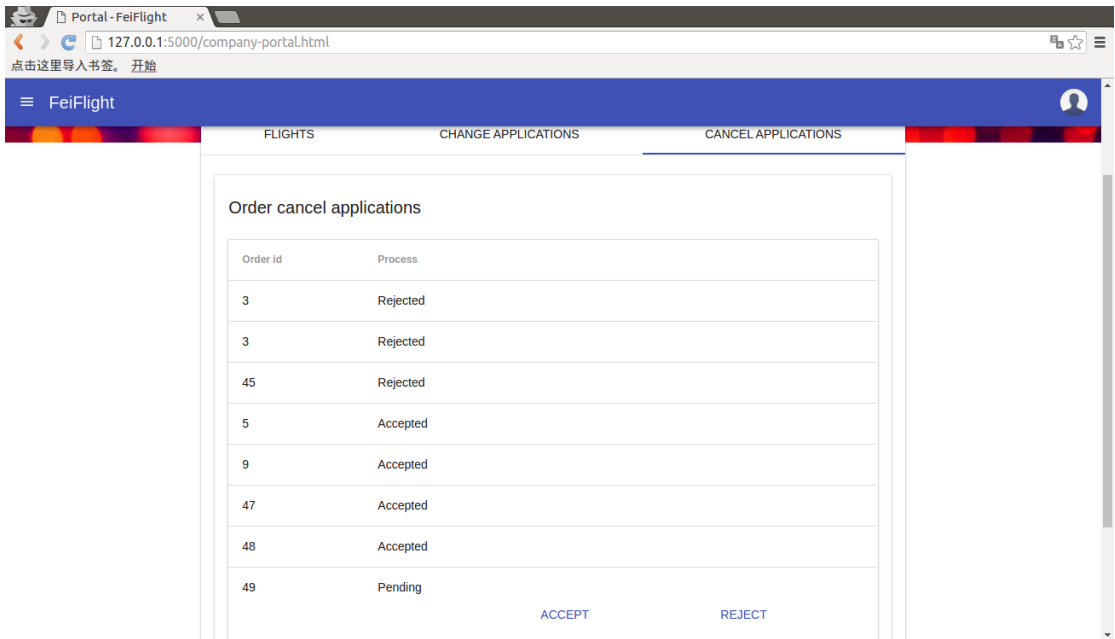
© 2016 FeiFlight



- 支付后可以点击 Cancel 并在弹出窗口点击 Confirm 取消订单，但需要航空公司批准。



- 航空公司对于客户的取消订单申请可以选择批准和拒绝。



- 下面再订一张单程机票用于演示改签，点击 Change 改签。

The screenshot shows the FeiFlight web application interface. The browser address bar displays "127.0.0.1:5000/order.html". The page title is "Order - FeiFlight". The main content area is titled "Flight Info" and contains three sections: "Flight Info", "Passenger Info", and "Order Info".

**Flight Info**

Airline	Flight	Class	Date	From	Time	To	Time	Point/Cancel/Change	Price per person
Hasi	HA223	Economy	2016-06-24	Shanghai	8:50	Guangzhou	11:20	513/ ¥ 111/ ¥ 50	¥ 832

**Passenger Info**

Name	ID
ZZZ	5555

**Order Info**

Name	Mobile	Point	Price	Time	Paid	Canceled
Database	12345678999	513	¥ 832	2016-06-11 15:41:43	No	No

At the bottom of the "Order Info" section, there are three buttons: "PAY NOW", "CHANGE", and "CANCEL".

- 在弹出的对话框中填写要改签的航班信息并点击 Confirm 确认，由于尚未付款，改签直接生效。

The screenshot shows the FeiFlight web application interface with a "Change order" dialog box open. The browser address bar displays "127.0.0.1:5000/order.html". The page title is "Order - FeiFlight". The main content area is titled "Flight Info" and contains three sections: "Flight Info", "Passenger Info", and "Order Info".

**Change order dialog box**

Flight number	Date	Cabin Class
HA235	2016-06-22	Business

At the bottom right of the dialog box, there are two buttons: "CLOSE" and "CONFIRM".

**Flight Info**

Airline	Flight	Class	Date	From	Time	To	Time	Point/Cancel/Change	Price per person
Hasi	HA235	Business	2016-06-22	Shanghai	15:30	Beijing	17:25	1243/ ¥ 88/ ¥ 47	¥ 1016

**Passenger Info**

Name	ID
ZZZ	5555

**Order Info**

Name	Mobile	Point	Price	Time	Paid	Canceled
Database	12345678999	1243	¥ 1016	2016-06-11 15:41:43	No	No

At the bottom of the "Order Info" section, there are three buttons: "PAY NOW", "CHANGE", and "CANCEL".

- 若在付款后改签，则需要经过航空公司批准，如左下角的消息框所示。

Order - FeiFlight

127.0.0.1:5000/order.html

点这里导入书签。 开始

FeiFlight

Change order

Flight number	Date	Cabin Class
HA223	2016-07-09	Economy

CLOSE

CONFIRM

Order #50

Flight Info

Airline	Flight	Class	Date	From	Time	To	Time	Point/Cancel/Change	Price per person
Hasi	HA235	Business	2016-06-22	Shanghai	15:30	Beijing	17:25	1243/ ¥ 88/ ¥ 47	¥ 1016

Passenger Info

Name	ID
ZZZ	5555

Order Info

Please wait for the permission from flight company

Name	Mobile	Point	Price	Time	Paid	Canceled
------	--------	-------	-------	------	------	----------

- 航空公司在控制面板上批准后，用户订单改签成功。

Portal - FeiFlight

127.0.0.1:5000/company-portal.html

点这里导入书签。 开始

FeiFlight

Portal

FLIGHTS CHANGE APPLICATIONS CANCEL APPLICATIONS

Order change applications

Order id	Flight number	Date	Cabin class	Process
3	HA235	2016-06-10	Economy	Accepted
6	HA233	2016-06-10	Economy	Rejected
15	HA235	2016-06-11	Business	Accepted
50	HA223	2016-07-09	Economy	Pending

ACCEPT

REJECT

## ● 订单改前成功

Order - FeiFlight

127.0.0.1:5000/order.html

点击这里导入书签。 开始

FeiFlight

### Order #50

#### Flight Info

Airline	Flight	Class	Date	From	Time	To	Time	Point/Cancel/Change	Price per person
Hasi	HA223	Economy	2016-07-09	Shanghai	8:50	Guangzhou	11:20	578/ ¥ 98/ ¥ 52	¥ 730

#### Passenger Info

Name	ID
ZZZ	5555

#### Order Info

Name	Mobile	Point	Price	Time	Paid	Canceled
Database	12345678999	578	¥ 730	2016-06-11 15:41:43	Yes	No

## ● 用户可以在右上角导航区点击 My trips 查询所有订单。

My trips - FeiFlight

127.0.0.1:5000/my-trips.html

点击这里导入书签。 开始

FeiFlight

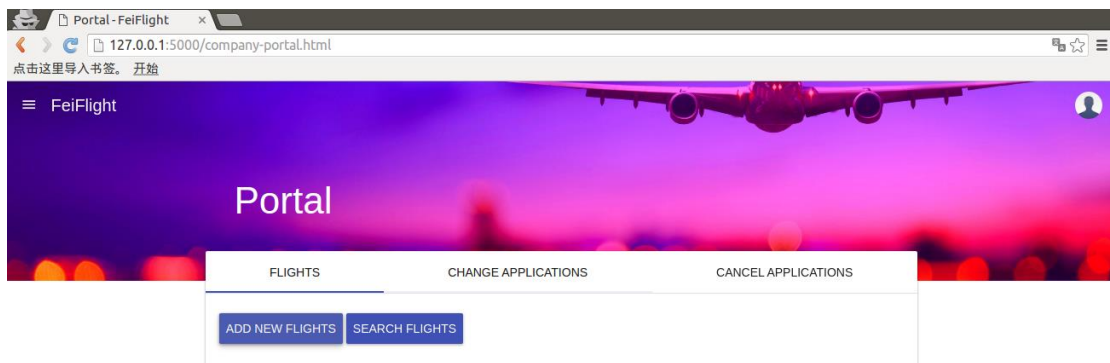
Balance	Points
657780	9519

[ADD MONEY](#) [WITHDRAW MONEY](#)

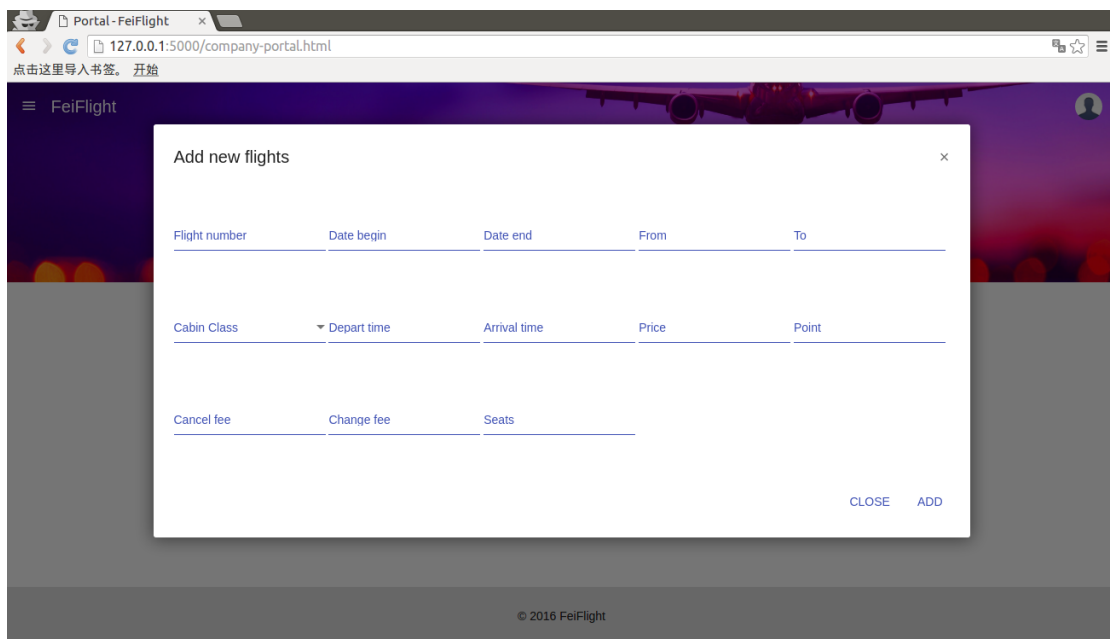
#### Orders

Time	From	To	Paid	Canceled	Price	
2016-06-11 15:03:55	Beijing	Shanghai	Yes	Yes	¥ 9828	<a href="#">DETAILS</a>
2016-06-11 15:10:45	Beijing	Shanghai	Yes	No	¥ 9718	<a href="#">DETAILS</a>
2016-06-11 15:41:43	Shanghai	Guangzhou	Yes	No	¥ 730	<a href="#">DETAILS</a>

- 航空公司控制面板可以发布航班计划、查询航班信息、处理退改签请求。



- 点击 Add new flights 发布航班计划，其中 Date begin 和 Date end 用于批量发布航班计划。



- 点击 Search flight 在对话框输入航班信息查询具体航班详细信息。

The screenshot shows the FeiFlight web application interface. The top navigation bar includes a menu icon, the text 'FeiFlight', and a user profile icon. The main content area displays 'Flight HA223' in large text. Below this, a table provides flight details:

Flight number	Date	Cabin Class	Seats
HA223	2016-07-09	Economy	199

From	TO	Depart time	Arrival time
Shanghai	Guangzhou	8:50:00	11:20:00

Price	Point	Cancel fee	Change fee
730	578	98	52

Below the table, there is a 'Canceled' status set to 'No'. At the bottom right, there are three buttons: 'PASSENGER LIST', 'MODIFY FLIGHT', and 'CANCEL FLIGHT'.

- 修改文本框中的信息并点击 Modify flight 修改航班信息，左下角弹出消息框表示修改成功。

The screenshot shows the FeiFlight web application interface after a successful flight modification. The top navigation bar and the 'Flight HA223' header remain the same. The flight details table is updated with the following information:

Flight number	Date	Cabin Class	Seats
HA223	2016-07-09	Economy	199

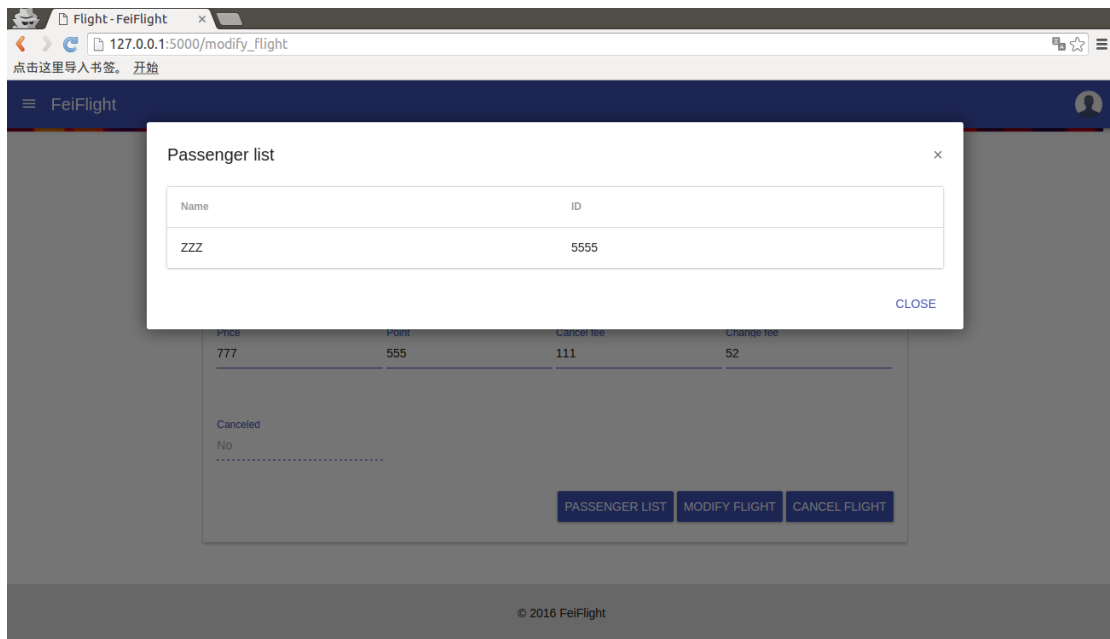
From	TO	Depart time	Arrival time
Shanghai	Guangzhou	8:50:00	11:20:00

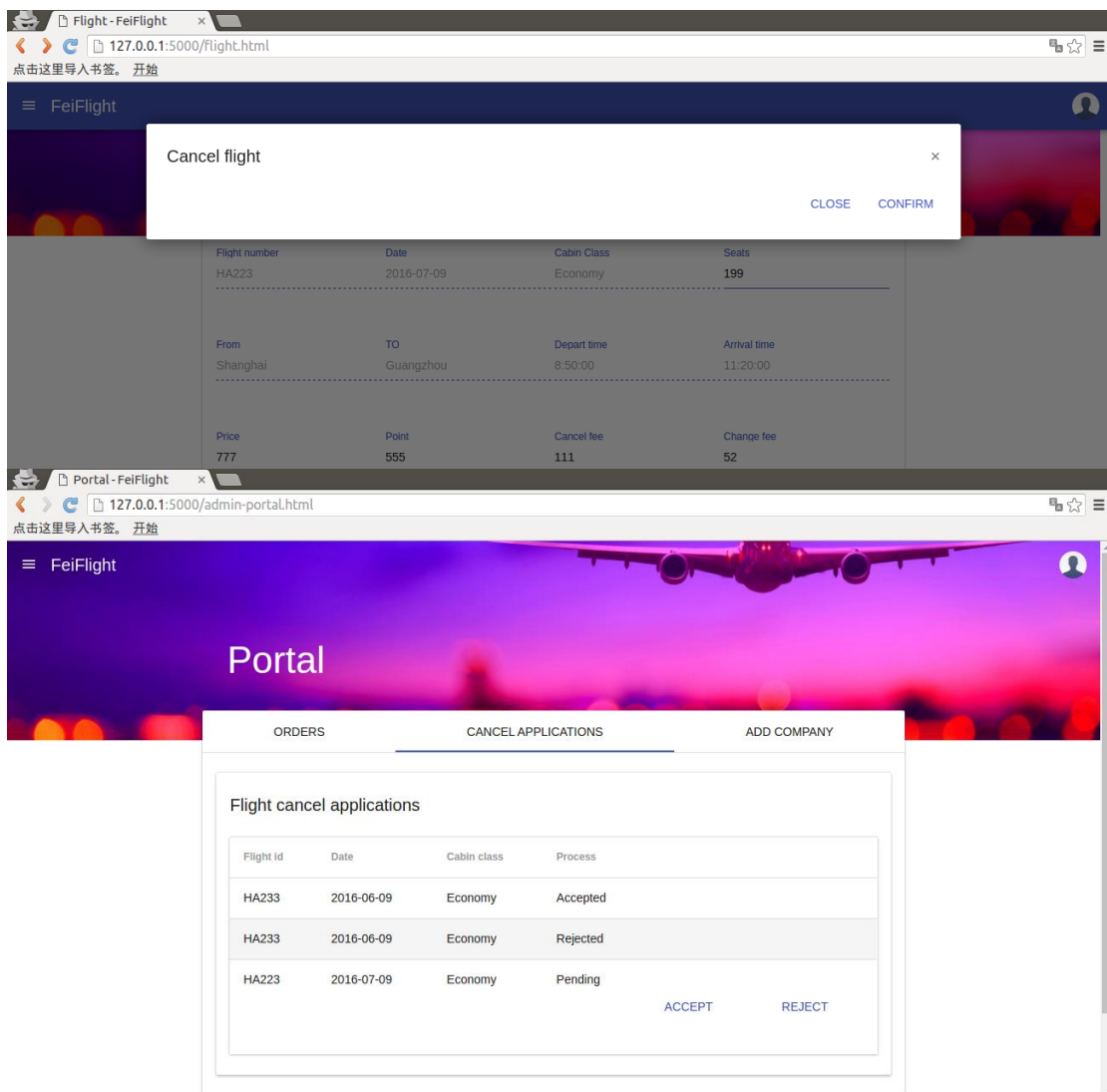
Price	Point	Cancel fee	Change fee
777	555	111	52

The 'Canceled' status remains 'No'. In the bottom left corner, a black message box with white text says 'Flight modified'.

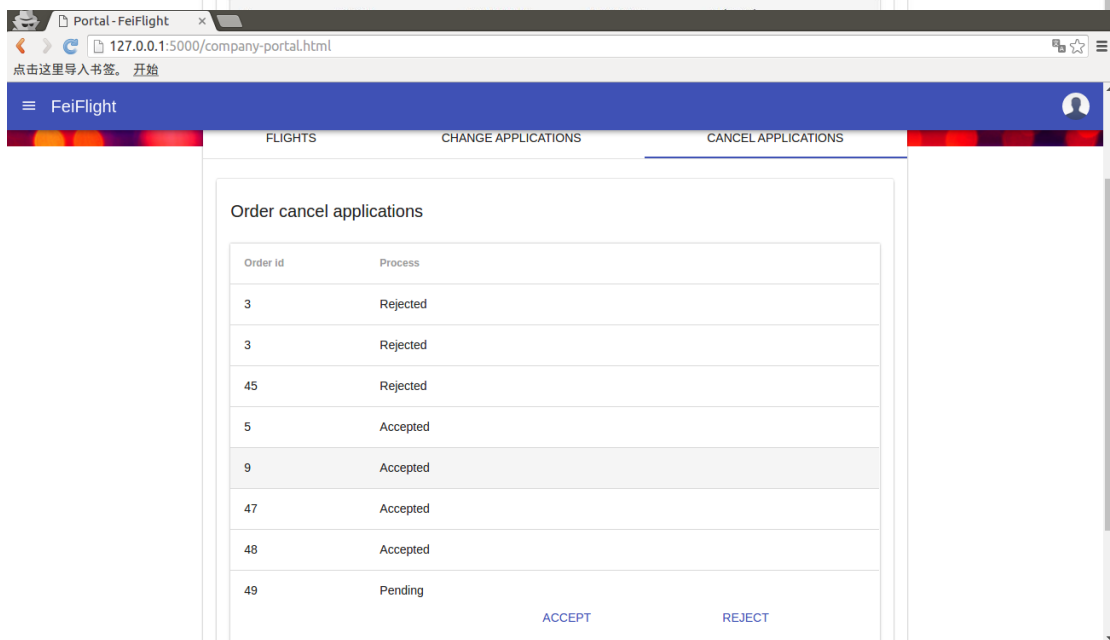
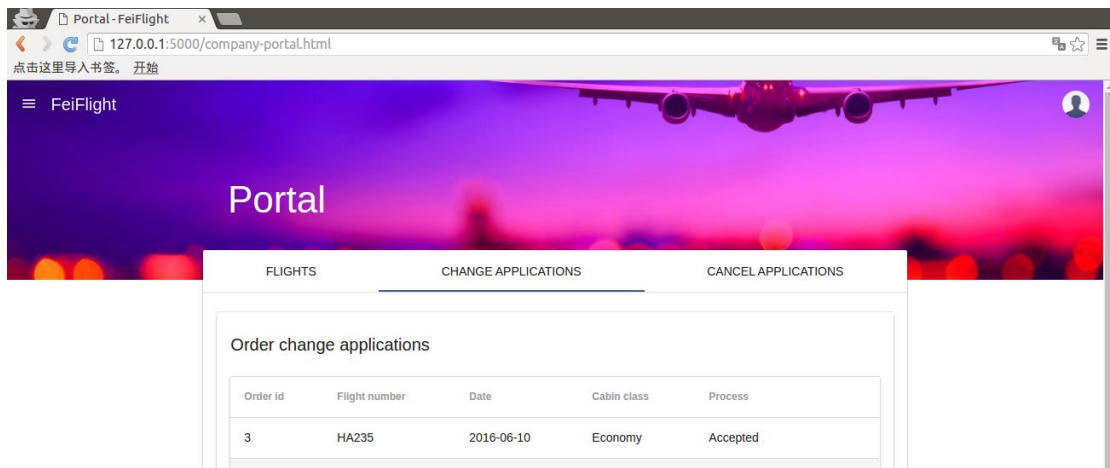
- 也可点击 Passenger list 查看旅客名单。



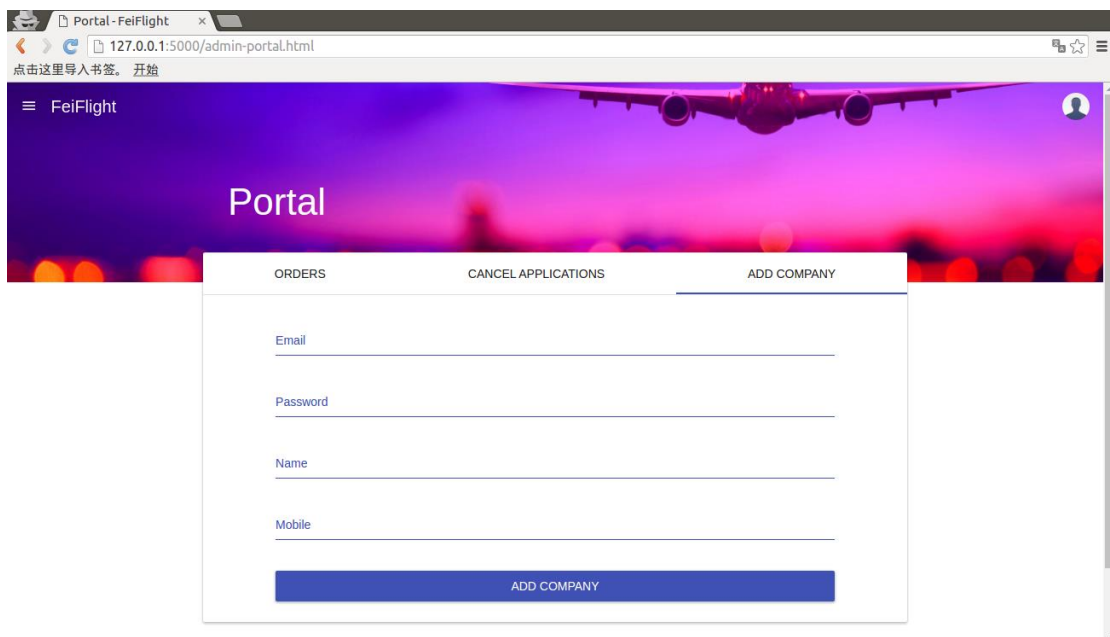
- 也可点击 Cancel flight 取消航班，但需要管理员批准。



- 航空公司可在控制面板切换选项卡处理退改签请求。

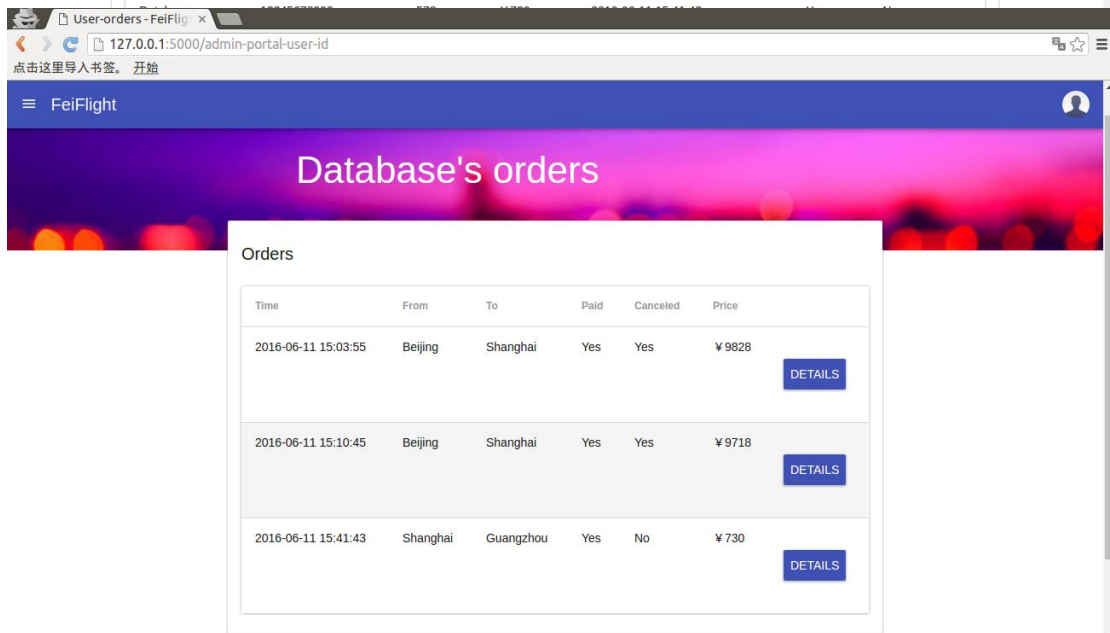
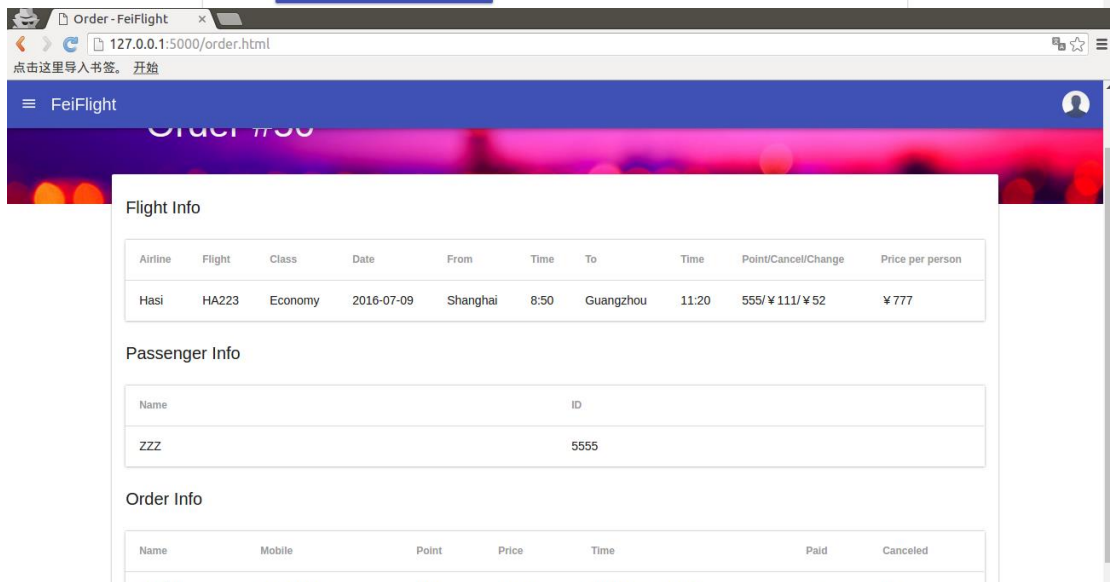
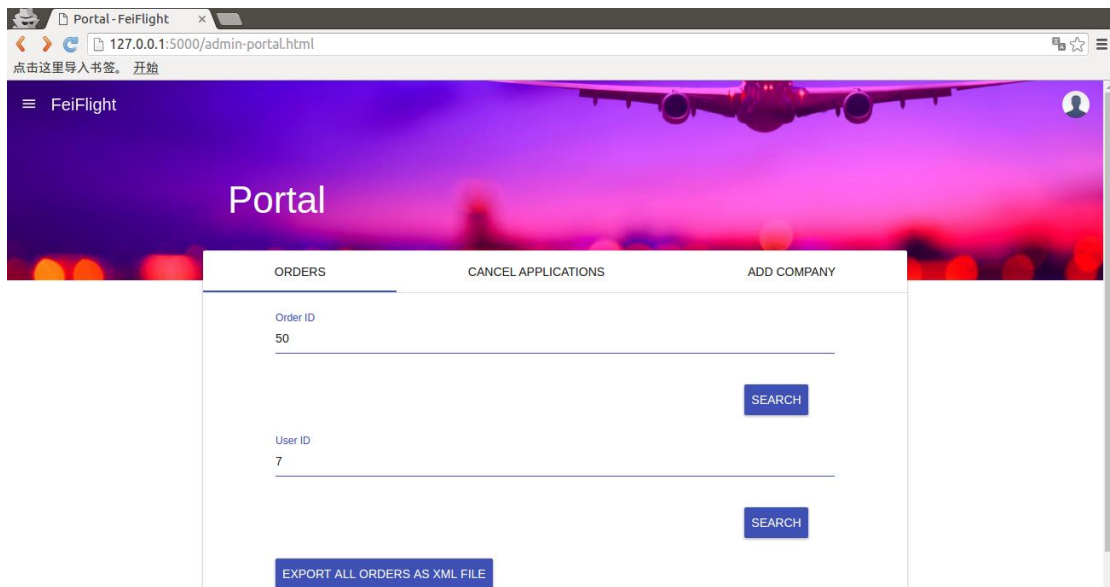


- 管理员在控制面板上可以添加新的航空公司账户





- 管理员可以分别通过订单号和用户 ID 查询订单。



- 管理员可以点击 Export all orders as XML file 将所有订单信息导出为 XML 文件。

The image shows two screenshots. The top screenshot is a web browser displaying the 'Portal - FeiFlight' interface. The browser address bar shows '127.0.0.1:5000/admin-portal.html'. The page has a header with 'FeiFlight' and a user profile icon. Below the header is a large banner with the word 'Portal' and a background image of an airplane. A navigation bar contains three tabs: 'ORDERS', 'CANCEL APPLICATIONS', and 'ADD COMPANY'. The 'ORDERS' tab is active, showing a form with two input fields: 'Order ID' and 'User ID', each with a 'SEARCH' button. At the bottom of the form is a button labeled 'EXPORT ALL ORDERS AS XML FILE'. A small notification box at the bottom left says 'Orders Exported'.

The bottom screenshot shows a file explorer window displaying the XML output of the export function. The file path is 'file:///home.../order.xml'. The XML content is as follows:

```
--<resultset statement="SELECT * FROM FeiFlight.order ">
--<row>
  <field name="id">0</field>
  <field name="customer_id">5</field>
  <field name="name">233</field>
  <field name="mobile">23323323323</field>
  <field name="time">2016-05-29 22:00:10</field>
  <field name="price">328</field>
  <field name="point">402</field>
  <field name="paid">0</field>
  <field name="canceled">1</field>
</row>
--<row>
  <field name="id">1</field>
  <field name="customer_id">5</field>
  <field name="name">233</field>
  <field name="mobile">23323323323</field>
  <field name="time">2016-05-29 22:05:05</field>
  <field name="price">1251</field>
  <field name="point">1268</field>
  <field name="paid">0</field>
  <field name="canceled">1</field>
</row>
--<row>
  <field name="id">2</field>
  <field name="customer_id">5</field>
  <field name="name">233</field>
  <field name="mobile">23323323323</field>
  <field name="time">2016-05-29 22:05:26</field>
  <field name="price">2770</field>
```