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# Research in Collective Intelligence through Horse Racing in Hong Kong

LYU1604

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Supervised By Prof. Michael R. Lyu

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Introduction

Technical support

System Architecture

Design and Implementation

Algorithm

Limitation

Crowdsourcing

Collective Intelligence

# Introduction

What is crowdsourcing?

General-purpose problem-solving method

Type of participative online activity





# Introduction

What is collective intelligence?

One of the application in crowdsourcing

Collect and combine information from two or more people



Provide solution to a specific problem



# Motivation

Crowdsourcing is a hot topic

Crowdsourcing system helps people to solve problem



Will users input some fake data that hinder the task?

Is there any way to filter the inappropriate data?

# Motivation

Conduct an experiment

find a good way to measure data provided by user

wisdom of crowd > single member's decision?



Why horse racing?

it provides discrete result, unlike stock market

results are changable, more difficult to predict

# Objective

design a voting system to let user predict horse racing result

design an algorithm to analyze the data

provide horse tips

# Technical Support

## Back-end development

phpMyAdmin

database for storing data and user information

user-friendly platform



## Front-end development

Dreamweaver

proprietary web development tool

some useful function: Live View, Check Page



# System Architechture

Client

Server





# Why PHP?

Simple and easy to learn

Support

Freedom

Free

Fast

# HELLO GUEST!

## Member Login

☒ Remember me

## Not a member yet? Sign Up!



HOT HORSE: 1.BOLSHOI BALLET  
2.FOXBAT  
3.CATCHMEIFYOUCAN

PREDICT NOW!

1 2 3 4 5 6

Race

2016-11-20

No.	Horse	Draw	Jockey	Trainer	win	place
1	BOLSHOI BALLET	3	S Clipperton	D J Hall	■ 26.0	■ 5.5
2	SEA JADE	7	T Berry	J Moore	■ 5.2	■ 2.1
3	REGENCY BO BO	13	N Callan	A S Cruz	■ 3.6	■ 1.9
4	CATCHMEIFYOUCAN	6	D Whyte	W Y So	■ 39.0	■ 8.3



Race

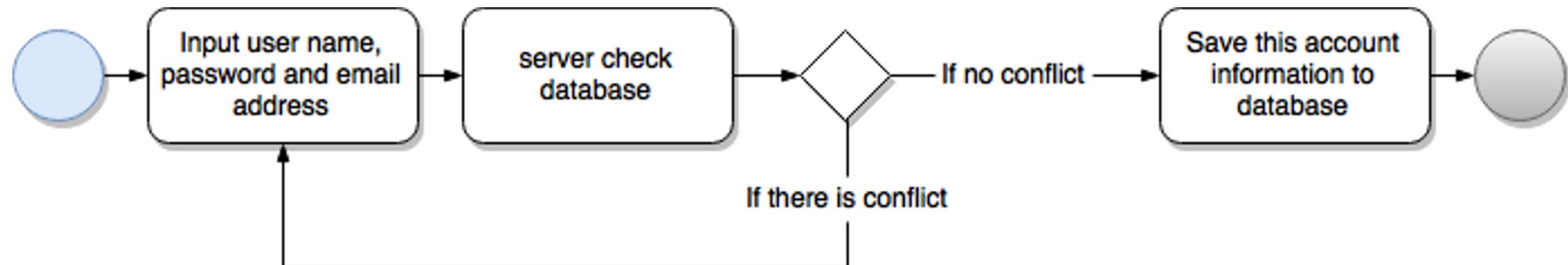
[1](#)[2](#)[3](#)[4](#)[5](#)[6](#)

2016-11-20

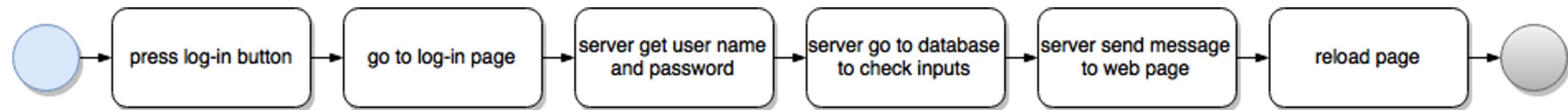
No.	Horse	Draw	Jockey	Trainer	win	place
1	BOLSHOI BALLET	3	S Clipperton	D J Hall	■ 26.0	■ 5.5
2	SEA JADE	7	T Berry	J Moore	■ 5.2	■ 2.1
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4	CATCHMEIFYOUCAN	6	D Whyte	W Y So	■ 39.0	■ 8.3
5	FOXBAT	10	K Teetan	P F Yiu	■ 22.0	■ 3.1
6	JUMBO LUCK	5	B Prebble	K W Lui	■ 15.0	■ 4.8
7	MONEY BOY	12	J Moreira	J Size	■ 3.9	■ 2.0
8	FOREVER ACCURATE	8	Z Purton	C H Yip	■ 10.0	■ 3.1
9	LONDON CITY	4	S de Sousa	K L Man	■ 19.0	■ 4.4
10	EMPIRE OF MONGOLIA	9	C Y Ho	C S Shum	■ 61.0	■ 11.0
11	AGIAAL	14	O Murphy	A Lee	■ 43.0	■ 8.5
12	AUDACITY	1	T H So	L Ho	■ 73.0	■ 11.0
13	WINNING BOY	11	C Schofield	R Gibson	■ 14.0	■ 3.2
14	IMPERIAL SEAL	2	M Chadwick	C Fownes	■ 20.0	■ 5.8

[Submit](#)

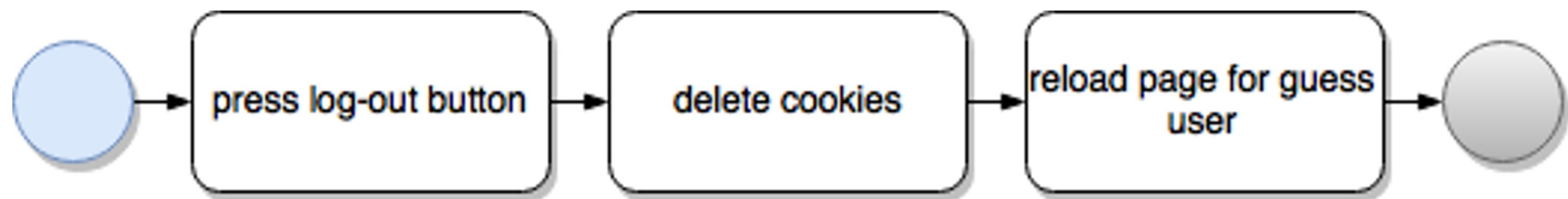
# Create Account



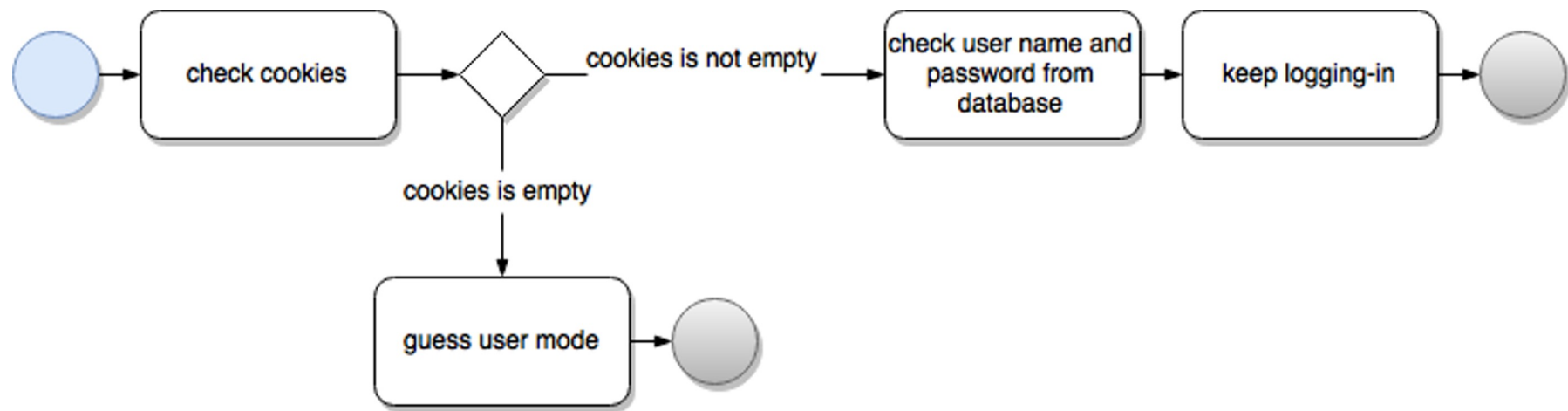
# Log-in



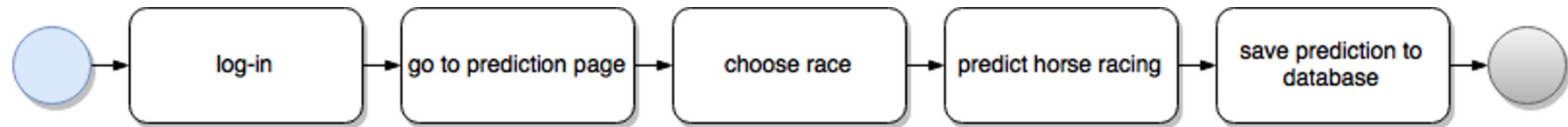
# Log-out



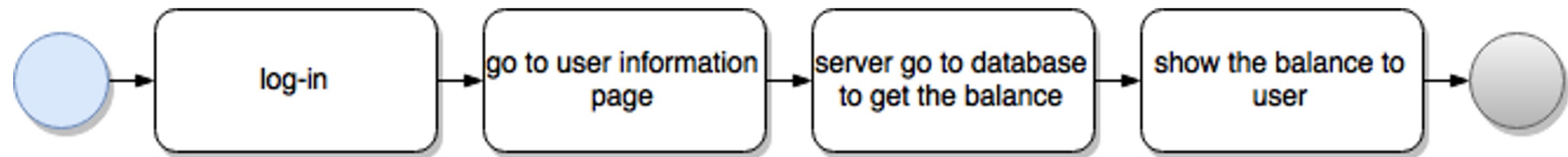
# Check Log-in status



# Predict Horse Racing



# Check Balance





# Design and Implementation

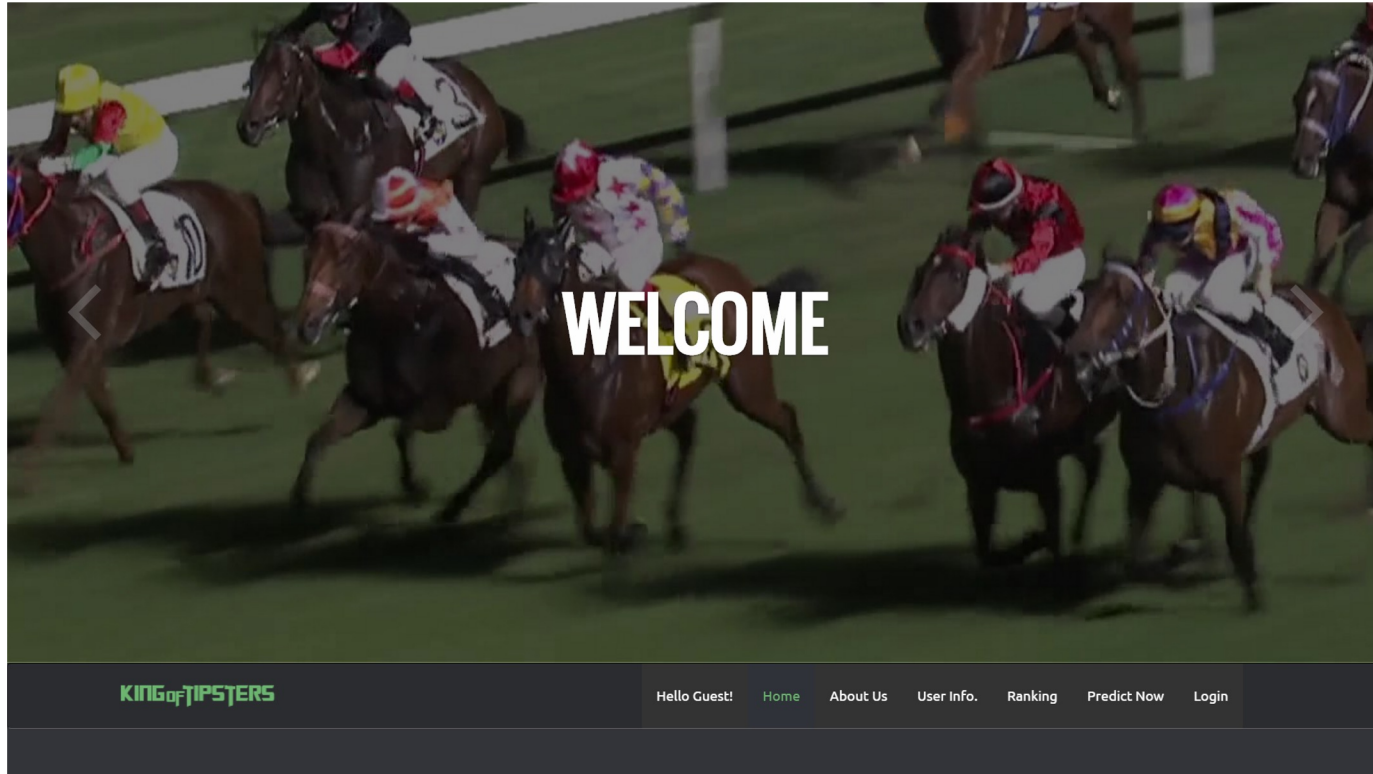
```
user(user_id: integer, user_name: varchar,  
password: text, email: varchar, win_rate: double,  
balance: double, regIP: varchar, date_time:  
timestamp)
```

```
buy_record(buy_record_id: int, buy_date_time:  
timestamp, user_id: int, amount: int, race_date:  
date, race_id: int, win: text, place1: text, place2:  
text, place3: text, earn_money: double)
```

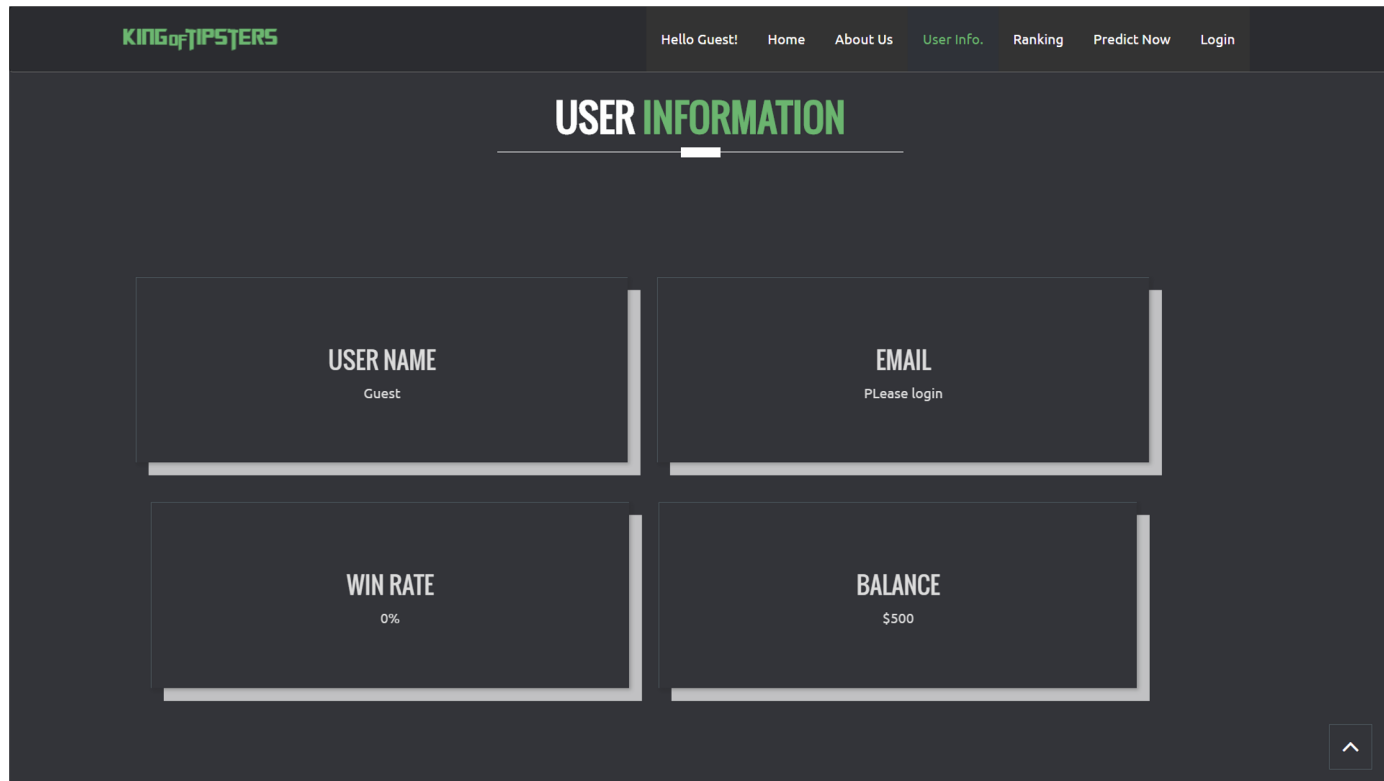
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A word cloud centered around the terms "SQL" and "INJECTION". The words are in various colors (teal, red, green, black) and sizes, arranged in a circular pattern. Key terms include: SQL, INJECTION, AUTHENTICATION, SUPERMARKET, USER, ALLEGEDLY, COMPROMISED, HASHES, PARAMETER, INPUT, BREACHED, CORRUPTS, VULNERABILITY, VULNERABLE, SECURITY, LOGON, REPRESENTATION, CORRELATING, PASSWORD, WEBSITE, VALIDITY, TECHNIQUE, AUTOMATED, RECORDS, WEB THEFT, CODE, APPENDED, GROUP, BACKSLASH, STATEMENT, SINGLE, INJECTED, DUMPLITERAL, UNENCRYPTED, COLUMN, HACKER, VECTOR, CREDIT, STR, BLINDMILLION, FILTERED, QUERY, FLAW, APPENDED, GROUP, BACKSLASH, STATEMENT, SINGLE, INJECTED, DUMPLITERAL, UNENCRYPTED, COLUMN, HACKER, VECTOR, CREDIT, STR, BLINDMILLION, FILTERED, QUERY, FLAW.

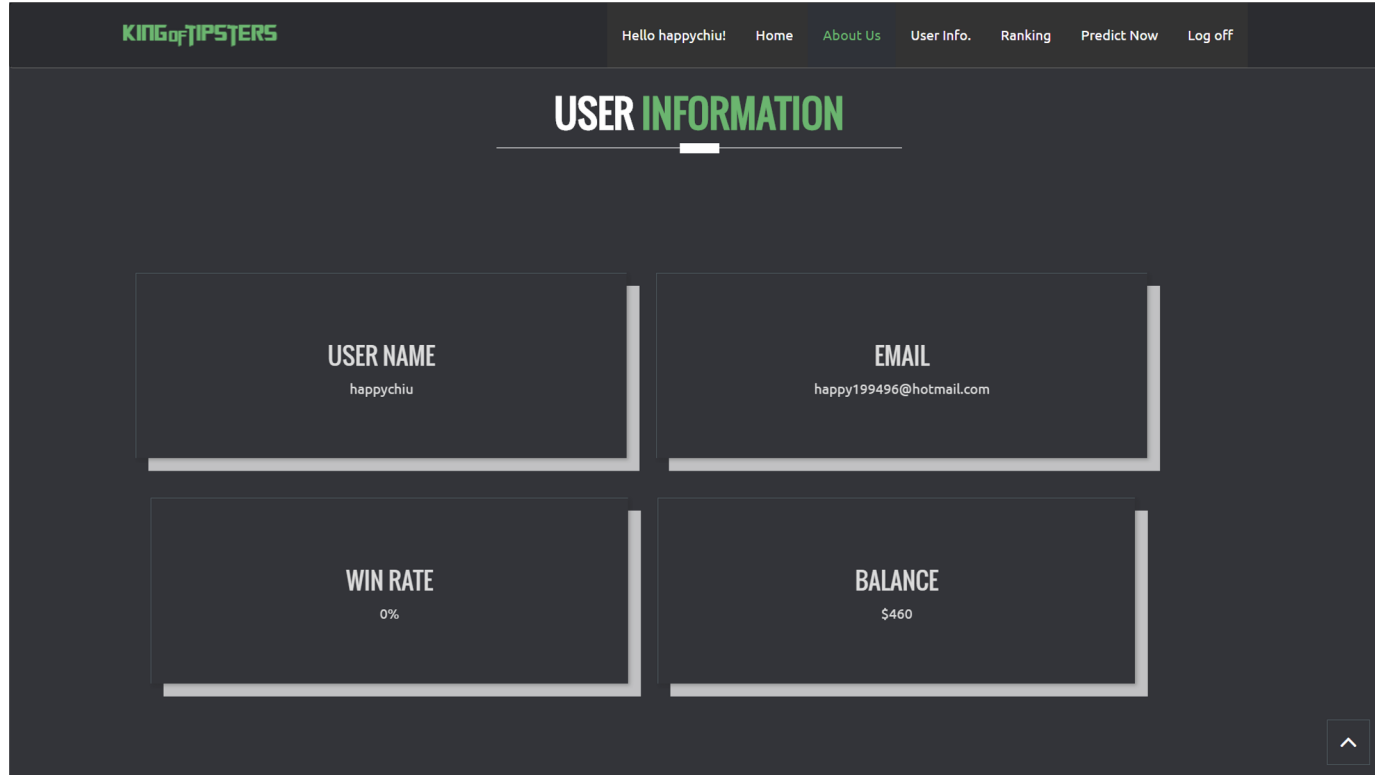
# User Interface Design



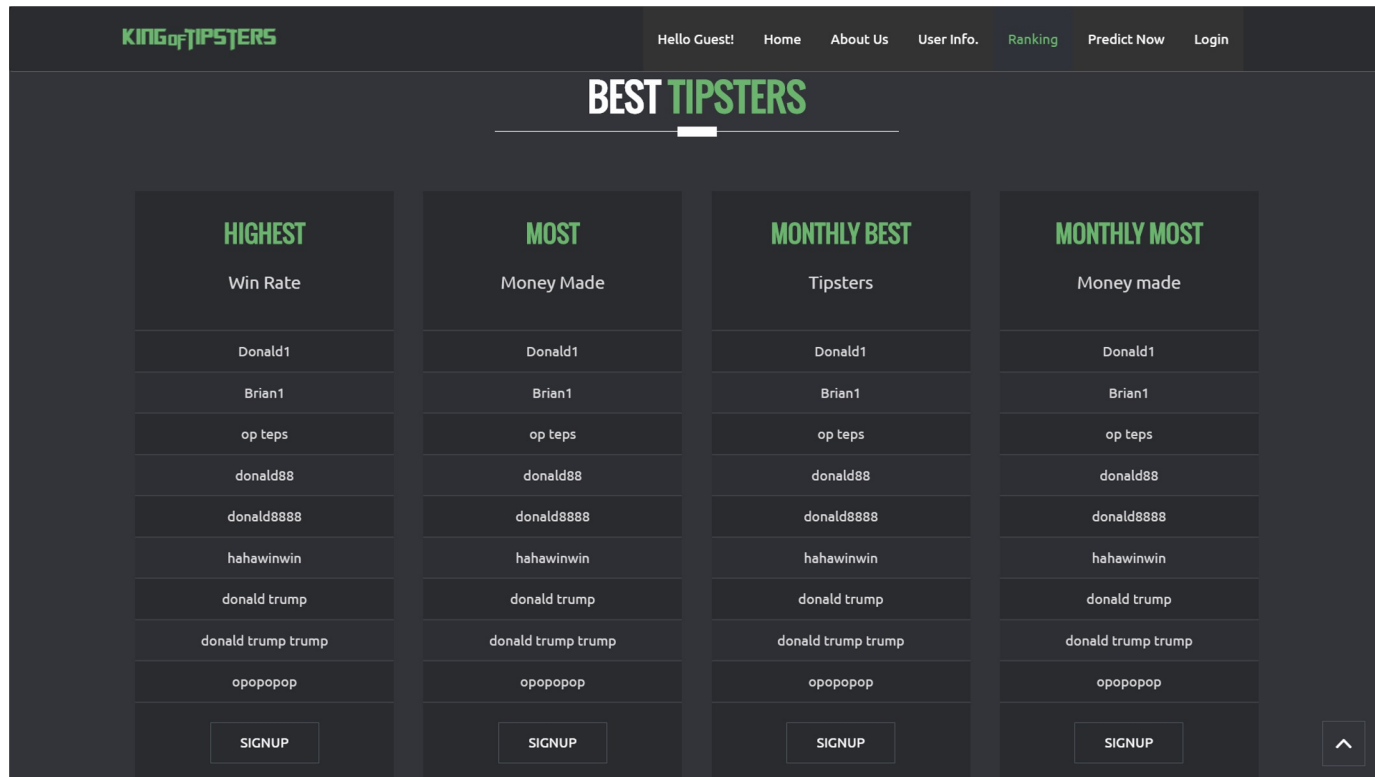
# User Interface Design



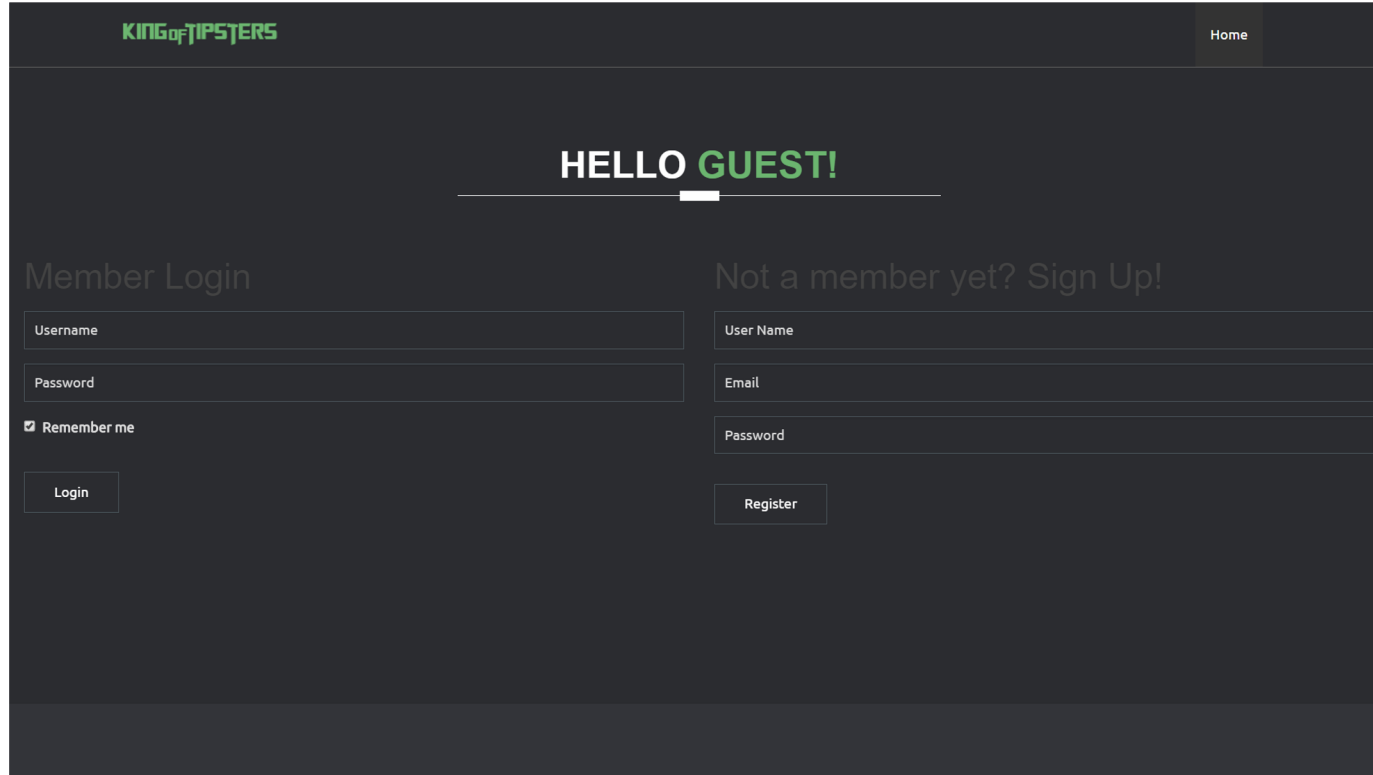
# User Interface Design



# User Interface Design



# User Interface Design



A dark-themed user interface mockup for a website called "KINGofTIPSTERS". The header features the site name in green and a "Home" link. The main content area greets a "GUEST" with a horizontal line. Below this, there are two columns: "Member Login" on the left and "Not a member yet? Sign Up!" on the right. The login section includes fields for "Username" and "Password", a "Remember me" checkbox, and a "Login" button. The sign-up section includes fields for "User Name", "Email", and "Password", and a "Register" button. The entire interface is set against a dark background with a teal footer bar.

KINGofTIPSTERS Home

HELLO GUEST!

Member Login

Username

Password

☒ Remember me

Login

Not a member yet? Sign Up!

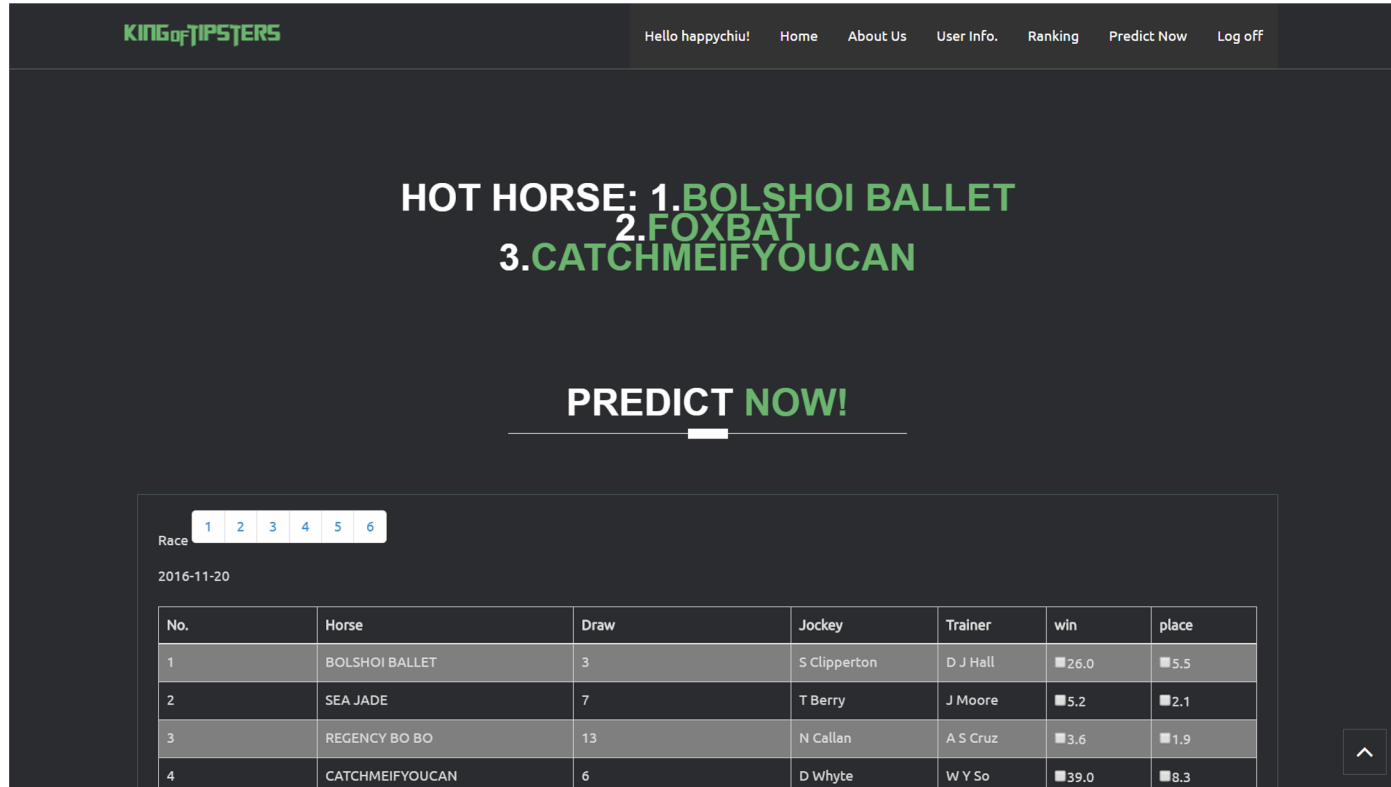
User Name

Email

Password

Register

# User Interface Design





# User Interface Design

KING of TIPSTERS

Hello happychiu! Home About Us User Info. Ranking Predict Now Log off

1 2 3 4 5 6

Race

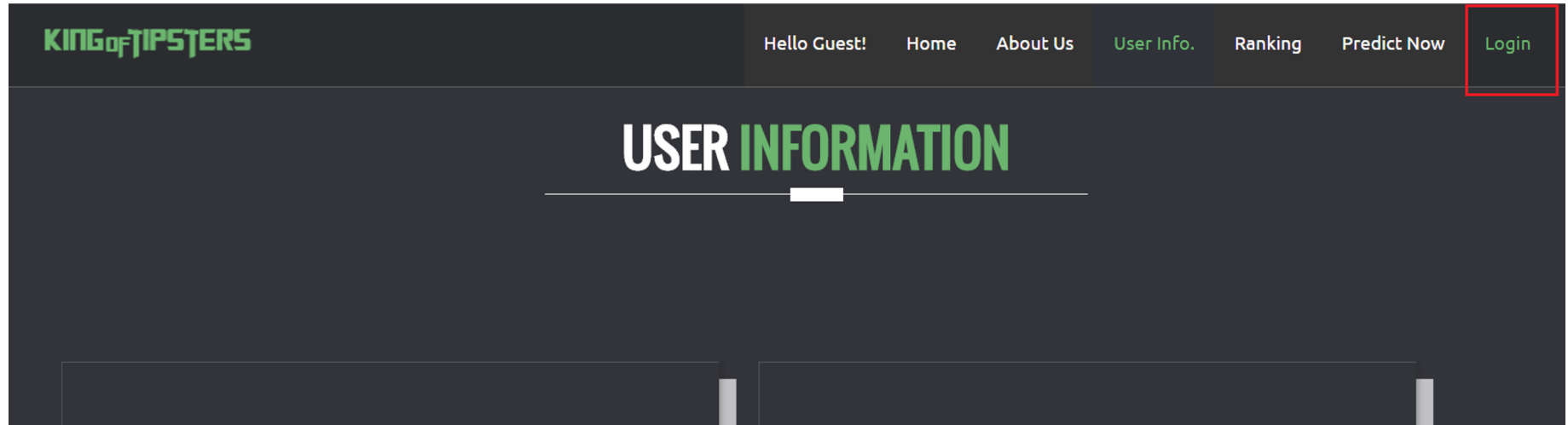
2016-11-20

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1	BOLSHOI BALLET	3	S Clipperton	D J Hall	■ 26.0	■ 5.5
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4	CATCHMEIFYOUCAN	6	D Whyte	W Y So	■ 39.0	■ 8.3
5	FOXBAT	10	K Teetan	P F Yiu	■ 22.0	■ 3.1
6	JUMBO LUCK	5	B Prebble	K W Lui	■ 15.0	■ 4.8
7	MONEY BOY	12	J Moreira	J Size	■ 3.9	■ 2.0
8	FOREVER ACCURATE	8	Z Purton	C H Yip	■ 10.0	■ 3.1
9	LONDON CITY	4	S de Sousa	K L Man	■ 19.0	■ 4.4
10	EMPIRE OF MONGOLIA	9	C Y Ho	C S Shum	■ 61.0	■ 11.0
11	AGIAAL	14	O Murphy	A Lee	■ 43.0	■ 8.5
12	AUDACITY	1	T H So	L Ho	■ 73.0	■ 11.0
13	WINNING BOY	11	C Schofield	R Gibson	■ 14.0	■ 3.2
14	IMPERIAL SEAL	2	M Chadwick	C Fownes	■ 20.0	■ 5.8

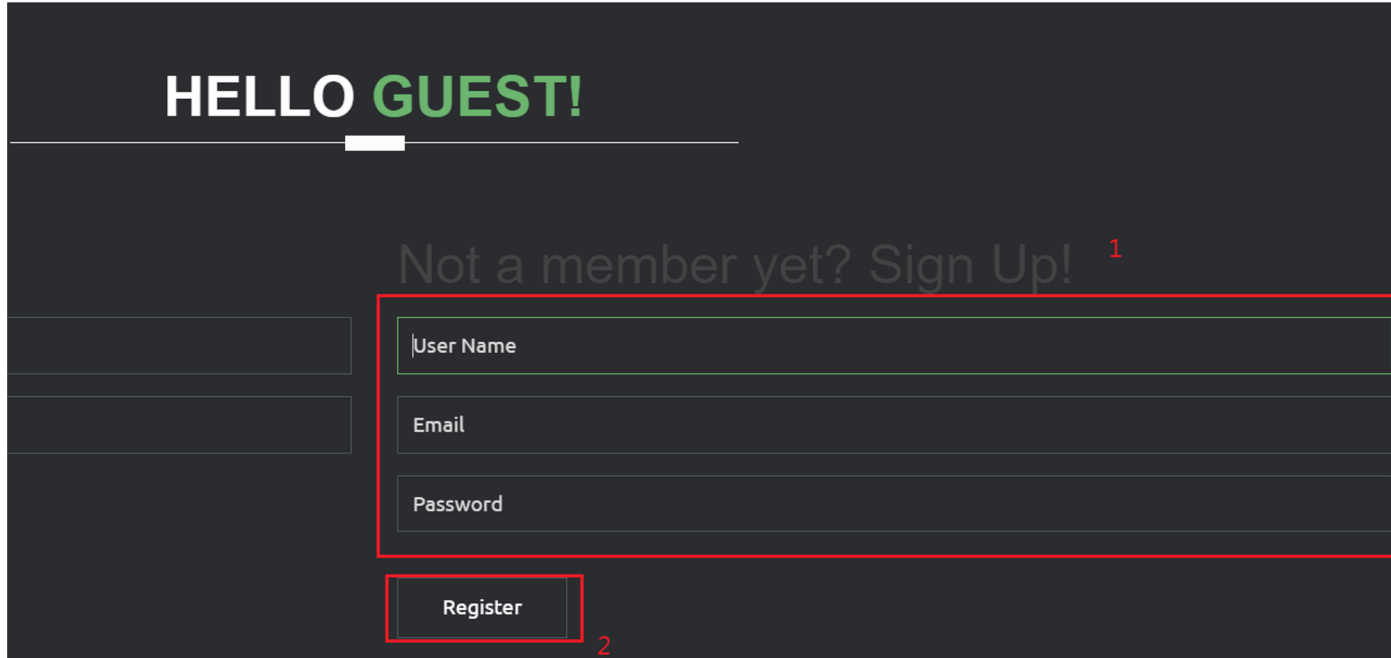
Submit

^

# Functionality - Registration



# Functionality - Registration



HELLO GUEST!

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Not a member yet? Sign Up! <sup>1</sup>

User Name

Email

Password

Register <sup>2</sup>

The image shows a registration form on a dark background. At the top, it says 'HELLO GUEST!' in white and green text. Below this is a horizontal line. Further down, the text 'Not a member yet? Sign Up!' is displayed in a light gray font, with a small red '1' as a superscript. The registration fields are enclosed in a red rectangular box. These fields include 'User Name', 'Email', and 'Password', each with a corresponding input area. Below the fields is a 'Register' button, which is also highlighted with a red rectangular box and a small red '2' as a superscript. To the left of the registration form, there are two empty input fields, likely for login credentials.

# Functionality - Registration

Not a member yet? Sign Up!

Your username must be between 3 and 32 characters!

Your email is not valid!

hi

a@a

....

Register

Not a member yet? Sign Up!

This username is already taken!

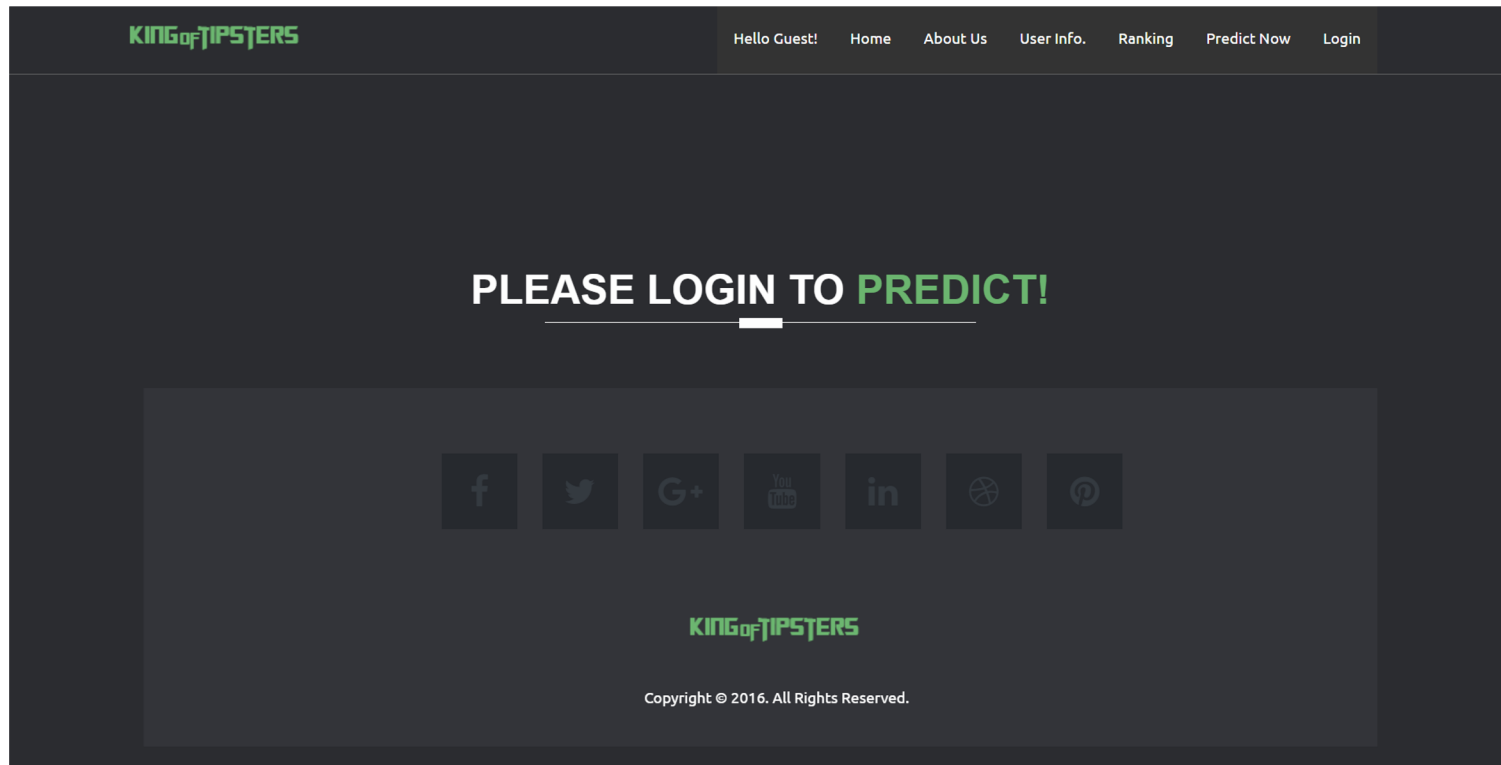
testuser

yoyoyo@yahoo.com

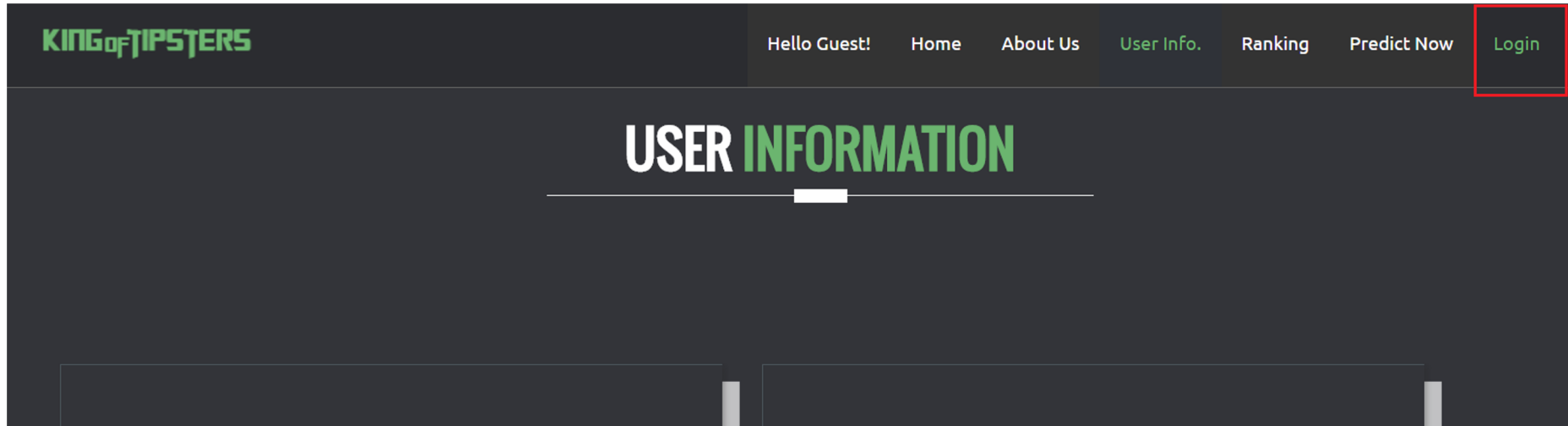
.....

Register

# Functionality - Login



# Functionality - Login



# Functionality - Login

Member Login <sup>1</sup>

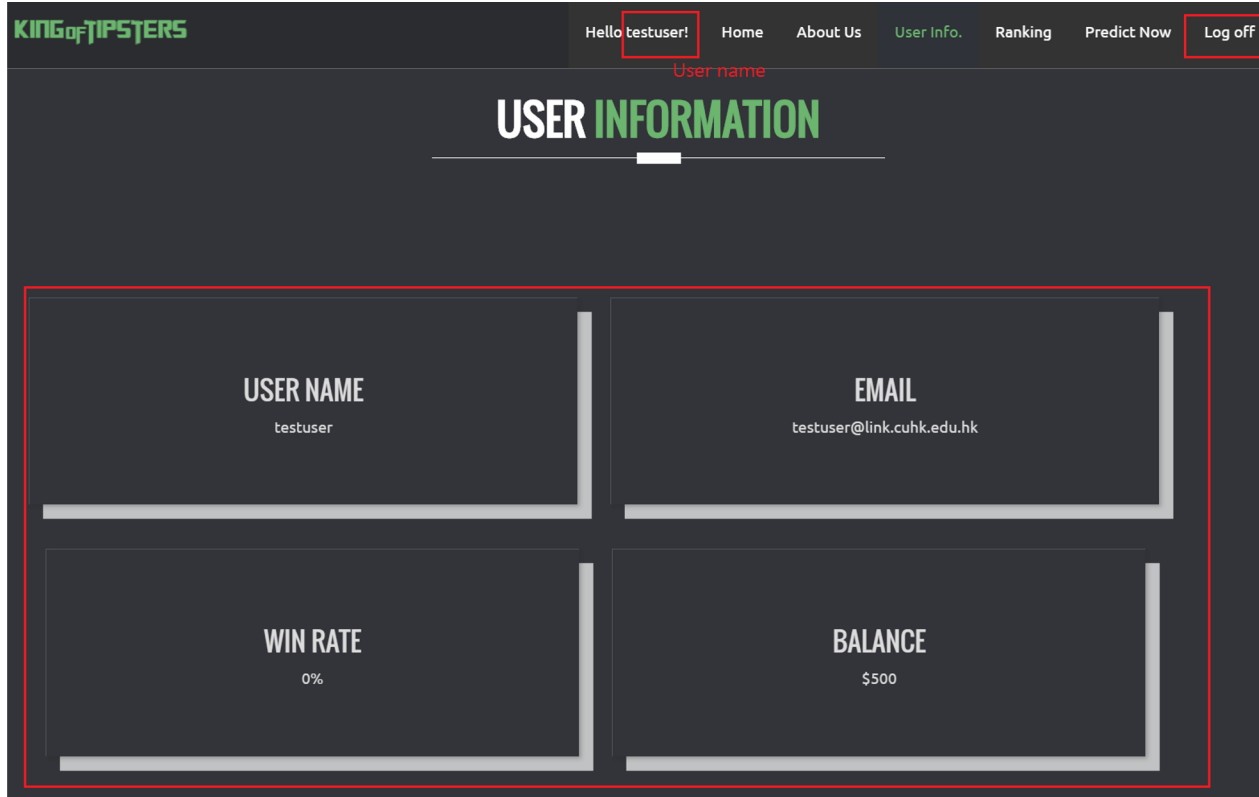
Username

Password

☒ Remember me

Login <sup>2</sup>

# Functionality - Login





# Functionality - Login

Member Login

Wrong username and/or password!

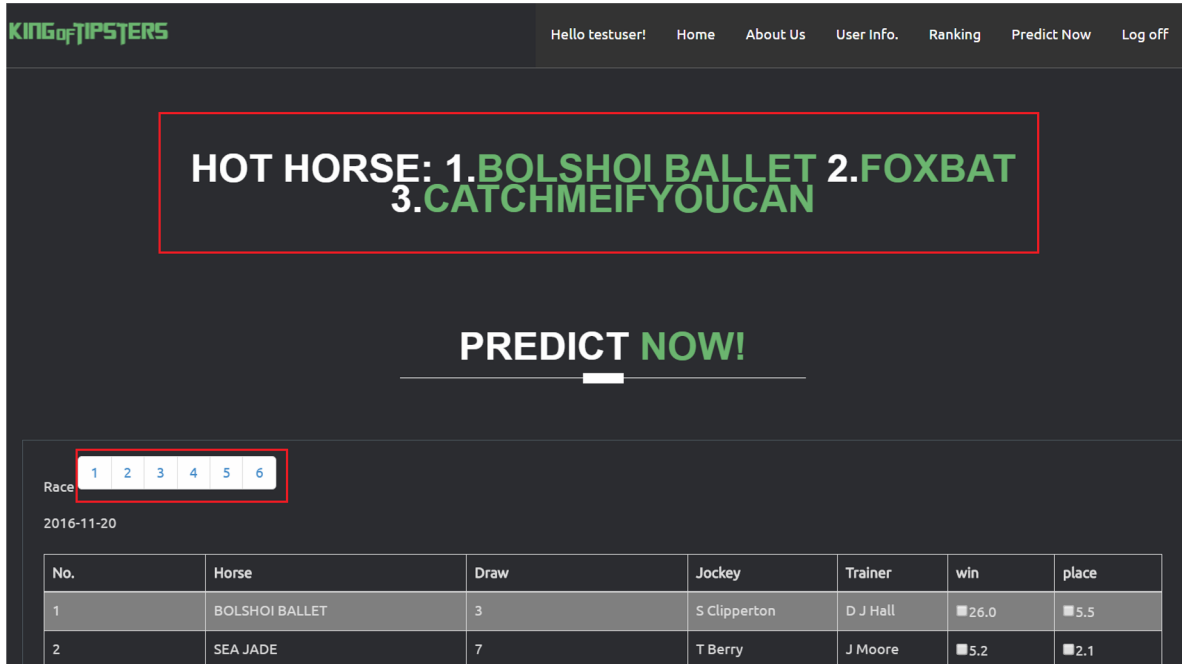
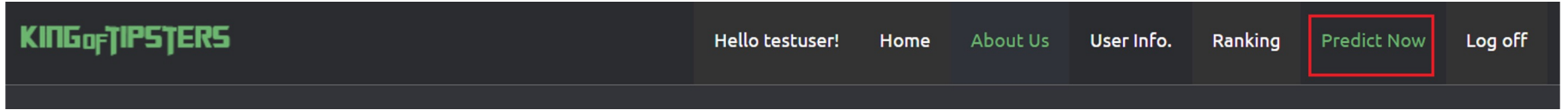
testuser

.....

☒ Remember me

Login

# Functionality - Prediction



# Functionality - Prediction

**KING of TIPSTERS**

Hello testuser! Home About Us User Info. Ranking Predict Now Log off

2016-11-20

No.	Horse	Draw	Jockey	Trainer	win	place
1	BOLSHOI BALLET	3	S Clipperton	D J Hall	<input checked="" type="checkbox"/> 26.0	<input type="checkbox"/> 5.5
2	SEA JADE	7	T Berry	J Moore	<input type="checkbox"/> 5.2	<input checked="" type="checkbox"/> 2.1
3	REGENCY BO BO	13	N Callan	A S Cruz	<input type="checkbox"/> 3.6	<input checked="" type="checkbox"/> 1.9
4	CATCHMEIFYOUCAN	6	D Whyte	W Y So	<input type="checkbox"/> 39.0	<input type="checkbox"/> 8.3
5	FOXBAT	10	K Teetan	P F Yiu	<input type="checkbox"/> 22.0	<input type="checkbox"/> 3.1
6	JUMBO LUCK	5	B Prebble	K W Lui	<input type="checkbox"/> 15.0	<input type="checkbox"/> 4.8
7	MONEY BOY	12	J Moreira	J Size	<input type="checkbox"/> 3.9	<input checked="" type="checkbox"/> 2.0
8	FOREVER ACCURATE	8	Z Purton	C H Yip	<input type="checkbox"/> 10.0	<input type="checkbox"/> 3.1
9	LONDON CITY	4	S de Sousa	K L Man	<input type="checkbox"/> 19.0	<input type="checkbox"/> 4.4
10	EMPIRE OF MONGOLIA	9	C Y Ho	C S Shum	<input type="checkbox"/> 61.0	<input type="checkbox"/> 11.0
11	AGIAAL	14	O Murphy	A Lee	<input type="checkbox"/> 43.0	<input type="checkbox"/> 8.5
12	AUDACITY	1	T H So	L Ho	<input type="checkbox"/> 73.0	<input type="checkbox"/> 11.0
13	WINNING BOY	11	C Schofield	R Gibson	<input type="checkbox"/> 14.0	<input type="checkbox"/> 3.2
14	IMPERIAL SEAL	2	M Chadwick	C Fownes	<input type="checkbox"/> 20.0	<input type="checkbox"/> 5.8

Submit

# Functionality - Prediction

USER INFORMATION	
<div>USER NAME</div> <div>testuser</div>	<div>EMAIL</div> <div>testuser@link.cuhk.edu.hk</div>
<div>WIN RATE</div> <div>0%</div>	<div>BALANCE</div> <div>\$460</div>

## Rating a User



## Rate by Win Rate

>40%



**Rate by Balance**

**>\$500**





# Bonus Rate for High Ranking Users

Rank	1	2	3	4	5	6	7	8	9	10
Bonus	20	19	18	17	16	15	14	13	12	11





**Suggestion of horses**



A background image of a horse race in progress. Several horses and jockeys are visible on a grassy track under a cloudy sky. The horses are in various stages of gallop, with some leading and others following. The jockeys are wearing colorful silks. The overall scene is dynamic and captures the intensity of the race.
$$\text{Score} = \left( \text{WinRate} + \frac{\text{Balance} - 500}{1000} \right) \times \text{BonusForTopUsers}$$



# Scenario

A background image of a horse race in progress. Several horses and jockeys are visible, competing on a grass track. The jockeys are wearing colorful silks and helmets. The horses are in full gallop, with their legs extended. The background is slightly blurred, emphasizing the speed of the race.

Horse no.	1	2	3	4	5	6	7	8
Score	0	0	0	0	0	0	0	0



# User No.1

**Win Rate 65%**

**Balance \$600**

**Not Best Tipsters**

**Win Prediction : Horse No.3**

**Place Prediction : Horse No.3 & Horse No.5**

Horse no.	1	2	3	4	5	6	7	8
Score	0	0	1.5	0	0.75	0	0	0



# User No.2

Win Rate 39%

Balance \$480

Not Best Tipsters

Win Prediction : Horse No.4

Place Prediction : Horse No.4 & Horse No.8

Horse no.	1	2	3	4	5	6	7	8
Score	0	0	1.5	0	0.75	0	0	0



# User No.3

Win Rate 36%

Balance \$1100

Best Tipsters Ranking : 3

Win Prediction : Horse No.1

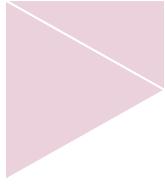
Place Prediction : Horse No.1, No.5, No. 8

Horse no.	1	2	3	4	5	6	7	8
Score	34.56	0	1.5	0	18.03	0	0	17.28



A photograph of a horse race in progress. Several jockeys in colorful silks are riding their horses across a green grassy field. The horses are in full gallop, and the jockeys are leaning forward. The background is slightly blurred, showing a line of trees and a fence. Overlaid on the center of the image is white text.

**Suggestions :**  
**Horse No.1**  
**Horse No.5**  
**Horse No.8**



# Limitation

Number of Users



**Thank You**

