BIC - Betting Information Center

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Abstract. The "BIC" is a project at Umeå University with the purpose of making an easy to use tool for people who want to bet on the popular game "Stryktipset". In this article you can read about the prototype application and the advanced features it holds. The web-based prototype application is implemented in PHP 4[1] and uses PostgreSQL[2] as the database engine.

1 Introduction

When betting on "Stryktipset" it’s hard to keep track of every team's statistics. Creating a winning ticket is very hard and this tool will help the better to collect statistics and expert advices data to a single place. The application will provide the better with accurate information in a way that’s easy to understand. The system will also propose a ticket based upon different parameters. The different parameters are "oddset", "svenska folket", expert advices, "tio tidningar" and "hemma/horta" statistics. The generated ticket will be based on these parameters together with the user's wishes of the importance of each parameter. These five parameters will then have a weight each, chosen by the user. The sum of the different parameters will be one. Every game has three possible outcomes: win, draw or loss. For every game and every parameter there will be a calculated probability for the outcome of the game. The tool is place for handling statistics and expert advices in a readable way and to see how the games outcomes are going to be for different parameter settings. The data is collected from Svenska Spel[3].

2 Method

In the beginning of the project, calculations were made to make sure that the initial idea for the probability model for the weighting of parameters would be possible to do, which it was indeed. When that was established we looked for the key requirements for the application which in a great deal was dependent on the information/data supplied by Svenska Spel[3]. The data provided by Svenska Spel resulted in an EER-diagram which was translated into the final schema for the database design. Since the data was delivered as URL's to several standalone XML-documents of different type, collector and parser
scripts in PERL[6] were developed to extract the relevant data. One of the key requirements beside the weight function was to develop a graphical user interface(Fig 1) that presents all data to the user in a way that minimizes the user’s mouse-click interaction with the application but yet makes it easy to change settings of parameters for the weight function. For that purpose dynamic HTML(DHTML) and javascript were used to a great extent, unfortunately this made the application browser(IE6) dependent. The application was implemented in PHP 4[1], has PostgreSQL[2] as the database backend and runs under Apache web server. PHP 4[1] is an open source project that is commonly used and well documented, but as database backend together with PHP 4 is MySQL[4] more common. Often in documentation or articles about PHP they will refer to LAMP(Linux,Apache,MySQL,PHP)[5][4][1] but for this project PostgreSQL[2] was chosen as database for the ability to construct our own functions.

2.1 Probability model

As mentioned, every possible outcome of a game is calculated for the different parameters. ”Tio tidningar”, ”svenska folket” and expert advices are really easy to calculate. The calculations for odds and hemma/borta statistics are shown below.

Odds

Let’s look at an example game with these odds:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>X</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIK - Djurgarden</td>
<td>1.5</td>
<td>3.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Probability for a home victory: \[ \frac{1}{1 + \frac{1.5}{3.0} + \frac{1.5}{4.0}} = 0.53 \]

Probability for a draw: \[ \frac{1}{1 + \frac{1.5}{3.0} + \frac{1.5}{4.0}} = 0.27 \]

Probability for an away victory: \[ \frac{1}{1 + \frac{1.5}{3.0} + \frac{1.5}{4.0}} = 0.20 \]

The calculated probability will be:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>X</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIK - Djurgarden</td>
<td>0.53</td>
<td>0.27</td>
<td>0.20</td>
</tr>
</tbody>
</table>

Hemma/borta statistics

An extract from the standings for these two teams:

<table>
<thead>
<tr>
<th></th>
<th>Home(Played Win Draw Loss)</th>
<th>Away(Played Win Draw Loss)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIK</td>
<td>13 6 2 5</td>
<td>12 3 3 6</td>
</tr>
<tr>
<td>Djurgarden</td>
<td>12 7 4 1</td>
<td>12 3 5 4</td>
</tr>
</tbody>
</table>
Since AIK is playing at home we only consider AIK’s home statistics and Djurgarden’s away statistics.
Probability for a home victory: \( \frac{6+4}{6+2+5+5+5+4} \)
Probability for a draw: \( \frac{5+3}{5+2+5+5+5+4} \)
Probability for a away victory: \( \frac{5+3}{5+2+5+5+5+4} \)

The calculated probability will be:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIK</td>
<td>0.40</td>
<td>0.28</td>
<td>0.32</td>
</tr>
<tr>
<td>Djurgarden</td>
<td>0.40</td>
<td>0.28</td>
<td>0.32</td>
</tr>
</tbody>
</table>

**Calculated outcome**

With the same example as before but only with two parameters where we assume that the user has decided the importance of the parameters as, odds = 0.70 and hemma/borta = 0.30:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIK</td>
<td>0.53</td>
<td>0.27</td>
<td>0.20</td>
</tr>
<tr>
<td>Djurgarden</td>
<td>0.40</td>
<td>0.28</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Probability for a home victory: \(0.53 \times 0.7 + 0.40 \times 0.30 = 0.491\)
Probability for a draw: \(0.27 \times 0.7 + 0.28 \times 0.30 = 0.273\)
Probability for a away victory: \(0.20 \times 0.7 + 0.32 \times 0.30 = 0.236\)

According to these statistics and weights the game will end in a victory for AIK with a probability of 0.491.

**2.2 Database design**

As mentioned before the database design was very dependent on the data provided by Svenska Spel, nevertheless the schema became highly strict with no redundancy of data, and all functions for calculation of the probability model are done directly by functions in the database which made it very fast and modular for changes. The final database schema consists of 10 tables and 4 functions, no special index was created.

**3 Result**

The application works as we planned and our goals with the project were fulfilled. The graphical user interface was kept simple, clean and with very few mouse-click interactions. The generated ticket with the calculated probabilities are shown aside of the row so it’s easy for the user to see the generated row. The database schema became compact and no performance issues arised.
**Fig. 1.** Screenshot of the web application

**Fig. 2.** 2nd screenshot of the web application
4 Discussion

During the project we had some difficulties to get hold of the data from Svenska Spel so we got delayed in the database design stage. But that time wasn't all wasted; we made several tests for different ways of calculating the probability model, so when we finally got hold of the data we were very sure about what data we needed for that part. Unfortunately, Svenska Spel were not able to give us all the data that we wished for. Two important statistical parameters are therefore not implemented, recently played games and mutual encounters. These two parameters would be crucial in a final version of the application to get the frequent betters to really appreciate it. This is a possible future work of this project. We want to point out that the tool's sole purpose is to present, for the user, how different parameters may affect the probability of the games outcome. It is not an intelligent tool that tries to make a correct ticket. It would have been interesting to see how the different parameters are performing over a long period of time. This is also a possible future work of this project.

References

1. http://se.php.net/
7. Javascript slider:
   http://www.eggheadcafe.com/articles/20020922.asp
8. Web application:
   http://www.cs.umu.se/~dva00jnd/db2/projekt/