How university entrants are choosing their department? Mining of university admission process with FCA taxonomies

Nikita Romashkin, Dmitry Ignatov and Elena Kolotova

Higher School of Economics, Moscow

July 8, 2011
EDM 2011
Outline

• Case Study
• Background
• Data
• Preprocessing
• Results
• Conclusions
Background

• HSE: 20 bachelors programmes
• Up to three programmes simultaneously
• Choose only one programme at the end
Data

• Admission to HSE in 2010

• 7516 entrants
  • 3308 successfully applied at least to one programme
  • But only 1504 become students

• Applied Mathematics and Information Science
  • 398 among 843 were somehow accepted
  • 72 decided to enroll
# Preprocessing

## Context of Entrants Decisions for Applied Mathematics and Information Science

<table>
<thead>
<tr>
<th>Entrant</th>
<th>Applied Mathematics and Information Science</th>
<th>Software Engineering</th>
<th>Economics</th>
<th>...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrant 1</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrant 2</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Entrant 3</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>
Preprocessing

• Similarly we built contexts for other 19 programmes

• We used meud* software tool to built a line diagram of concepts for a certain formal context

Results

Iceberg lattice* for AM&IS context

*Mathumme et al., 2002
Results

Iceberg lattice of “efficient” choice

Fig. 1. Other programmes which entrants of Applied Mathematics and Informatics programme also apply.

Fig. 2. “Efficient” choice of entrants to Applied Mathematics and Informatics programme.

Who successfully apply to the Applied Mathematics and Informatics programme. Whereas just 18 percent of successful applicants then become students on the Applied Mathematics and Informatics programme. Exactly 5 percent prefer Software Engineering and 5 percent of entrants who choose Applied Mathematics and Informatics also successfully applied to Software Engineering. It can be interpreted as equality of entrants preferences concerning these two programmes. Additionally, 5 percent prefer Business Informatics and only two percent of entrants who prefer Applied Mathematics and Informatics also successfully apply to Business Informatics, therefore in the pair Business Informatics and Applied Mathematics and Informatics the latter one is less preferable by entrants.

Here we should note that the sum of nodes percents with labels containing plus sign and node “- Other -” must equal to 100s, however here it does not because we excluded some nodes during filtering.
Conclusions

• Entrants tend to choose programmes with the same set of entrance exams

• Many entrants don’t differentiate between Software Engineering and Applied Mathematics & Information Science

• Surprisingly, World Economy programme is more preferable by entrants than Economics programme

• Sociology programme is a backup one for many entrants

• ...
Acknowledgments

• Institutions
  • Scientific Foundation of Higher School of Economics, Moscow
  • Russian Foundation for Basic Research

• Persons
  • Jonas Poelmans, KU Leuven
Thank You!