EXECUTIVE SUMMARY

Mind the Gaps:
Snapshot Survey Shows Key Differences Between the Teaching and Practice of Advanced Analytics

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Students of advanced analytics who aspire to leave academia and succeed quickly in business and government arenas should assess their approaches and tools in the classroom and their research, according to a recent Princeton Consultants survey at the INFORMS Annual Meeting November 1-4 in Philadelphia. There are notable gaps between what students learn, what professors teach, and what practitioners need.

Irv Lustig, Princeton Consultants Optimization Principal and longtime active INFORMS member, reports the following findings:

- Students must learn more about building applications with modern technologies so they have the skills needed by the practice community.
- Professors are not teaching the programming languages used by students or in practice. Students and practitioners are using both Python and R, both of which are used heavily in the data science community, but faculty members are not adapting their courses to teach these new languages. Students' use of MATLAB is high, despite its low use in practice.
- Aside from AMPL, there seems to be misalignment between the use of modeling languages in academia and the use of modeling languages in practice.
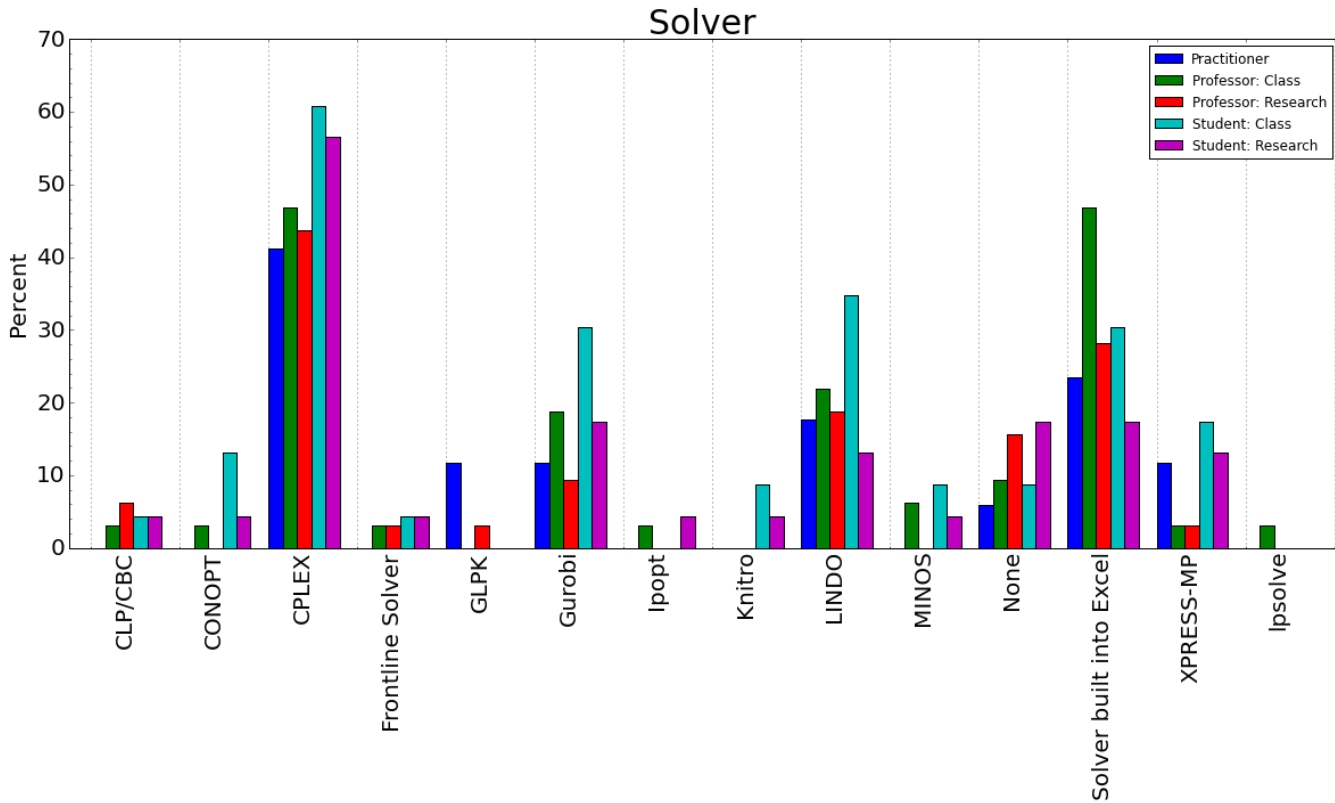- Professors are teaching using the Solver in Excel far more than is used in practice.

About the Survey

There were 72 total survey participants, all of whom were onsite at the INFORMS annual meeting. 44% were professors; 32% students; and 24% practitioners. The survey was designed to compare the responses of these three groups about solvers, programming languages, modeling languages, and software development.

Page 1

Participants were asked to answer based on their last two years of experience. For each question, participants could select multiple answers, and the graphs show the percent of respondents in that category who chose that answer.

Topic 1
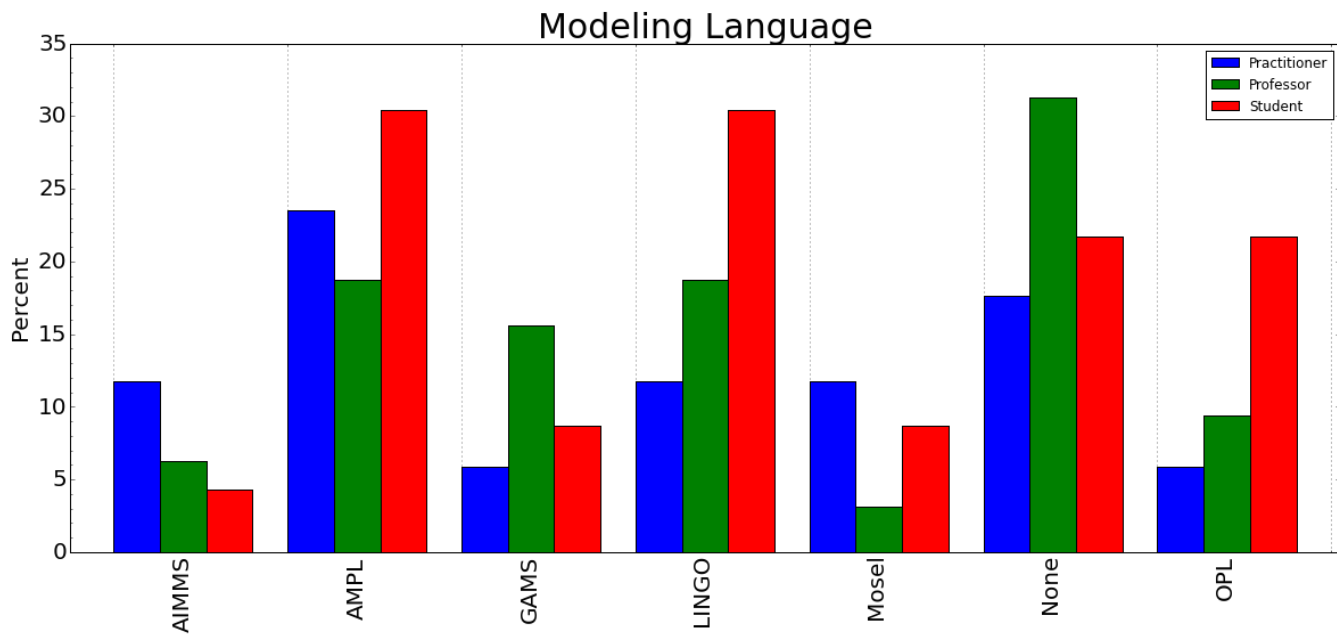**What solvers are used in practice, in the classroom, and in research?**

Comments
There is general alignment between practitioners, professors and students. However, professors are teaching with the Solver in Excel far more than is used in practice.

Topic 2
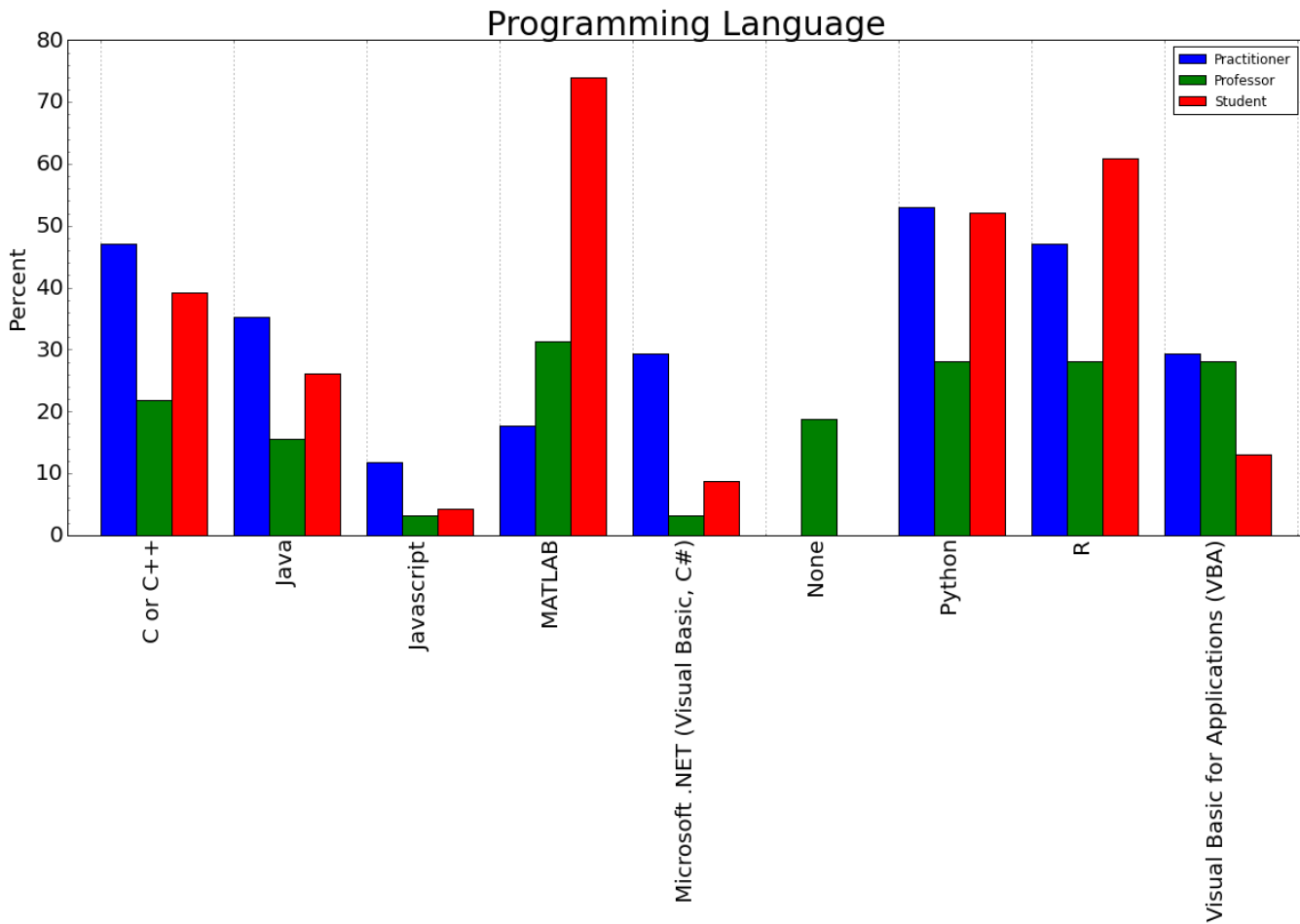**What modeling languages are used in practice, in the classroom, and in research?**

Comments
Aside from AMPL, there seems to be misalignment between the use of modeling languages in academia and the use of modeling languages in practice.

Topic 3
What programming languages are used in practice, in the classroom, and in research?

Programming Language

Comments
The responses suggest that professors are not teaching the languages used by students or in practice. The use of MATLAB is high by students (75%), despite its low use in practice (less than 20%). Students and practitioners are using both Python and R, both of which are used heavily in the data science community, but faculty members are not adapting their courses to teach these new languages.

Topic 4
How are analytics embedded inside applications in practice, in the classroom, and in research?
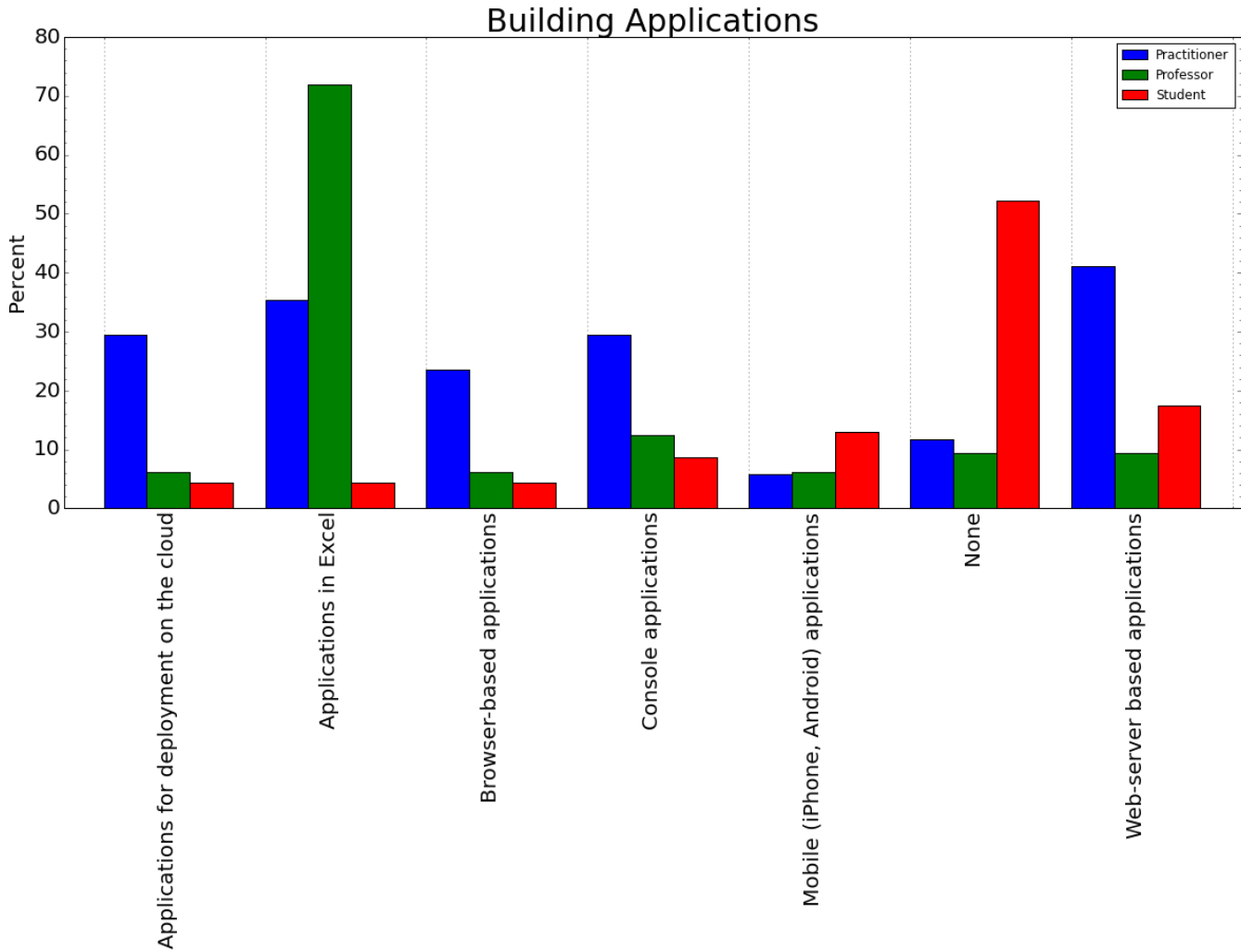
Comments

The misalignment between what is taught in professor's programs and what the students are learning is stark. Students need to learn more about building applications so they have the skills needed by the practice community.

About Princeton Consultants

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