

KöMaL CD – *The execution*

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What is KöMaL?

The first edition of Mathematical and Physical Journal for Secondary Schools (Középiskolai Matematikai és Fizikai Lapok – KöMaL [1]) appeared in the 19th century, on the 1st of January, 1894, under the name High School Mathematics Journal (Középiskolai Matematikai Lapok). Dániel Arany, a teacher of mathematics, founded the Journal. Since 1894, generations of mathematicians and scientists have developed their problem-solving skills through KöMaL. The best solutions with the names of the 14–18 year-old authors are printed in the periodical. KöMaL regularly reports on national and international competitions, prints articles on interesting results in mathematics and physics, and includes book reviews. At the present time, KöMaL is the oldest existing journal in Hungary.

From the beginning there have been competitions based on collecting points in the Journal, first only in mathematics and only in Hungarian and later in physics (from 1925) and in information technology (from 1981), and in several other languages: mainly in English (from 1965), but also in German, French, Russian, and Esperanto. For more than 30 years all the new problems have appeared in English as well as in Hungarian in the Journal. This means thousands of mathematics and physics problems and exercises have been published in English.

The periodical KöMaL is published in Hungarian nine times a year, and in English twice a year. Each issue is 64 pages.

The first CD

From the beginning until 1991 KöMaL was typed by hand. In 1995, we scanned all the pages of the issues and made a CD with the scanned pages. It is also viewable on the Internet, on the home pages of Educational Ministry, www.sulinet.hu/komal. We made a foundation of a searchable database for articles, problems, competitions etc. Of course, the scanned pages had limitations, such as problems with text quality, users being unable to search for words, copy problems, etc.

In 2004 we decided to type all 39,000 pages, and convert them to MathML. Then we made a CD which contains the pages of the Journal from 1994 to 2003. During the process we have faced several problems: from 1994 to 2001 the Journal was typed in plain TEX , with different macros. From 2002 we have been using $\text{L}\text{A}\text{T}\text{E}\text{X}$, with more and more packages. Finally Géza Makay, a teacher at Szeged University, made a converter from $\text{L}\text{A}\text{T}\text{E}\text{X}$ to MathML, so now the CD has a web interface. He has also created a more user friendly database, which contains the title of the articles, the label and the mathematical type of the problems, the name of the authors and who made the best solutions of the problems, the final results of KöMaL competitions with photos of the overall winners, etc.

The project

To type the hand-made pages of the past years we needed manpower for the project. Finally in 2005 we were awarded a grant from the European Union and the nation of Hungary. So we could start the job with 24 low educated, disabled people. Some of these people have never touched a computer before they started this job. We had only two weeks to teach them how to use a computer and one more week to use $\text{L}\text{A}\text{T}\text{E}\text{X}$. So we had to create a curriculum which was flexible, very easy to learn and follow, and user friendly. After this short course the workers were given a computer, and they were expected to work in their own home. We found several free sources for learning $\text{L}\text{A}\text{T}\text{E}\text{X}$ on the Internet, these were Oetiker-Partl-Hyna-Schlegl's ' $\text{L}\text{A}\text{T}\text{E}\text{X} 2_{\epsilon}$ in 78 minutes' and Gábor Csárdi's ' $\text{L}\text{A}\text{T}\text{E}\text{X} 2_{\epsilon}$ in 69 minutes'.

After the course they needed constant tutorial help, which was done by establishing an Internet connection. They also helped themselves using the Internet. The first questions were very simple but after a few months they could handle more and more complicated equations and tables in $\text{L}\text{A}\text{T}\text{E}\text{X}$.

Finalizing of the database

A couple points about the converter: e.g., we use equation numbering only with the `\tag` command (not with `\label`). We do not use `\textwidth` and `\textheight`, because of the web interface.

The workers load the database with \LaTeX files. The database translates the \LaTeX source with a fixed preamble and they can view the DVI results. Another person checks and corrects the \LaTeX source. Over one year they were able to type and correct more than 15 years of the Journal.

The CD: “Aim at the Nobel prize”

This CD provides a unique opportunity to improve the knowledge of mathematics, physics and information technology of talented students, parents as well as teachers. The content is searchable according to multiple criteria, and one can even create his/her own worksheet using the selected problems or articles.

There were several famous Hungarian mathematicians who read the Journal and solved the problems, e.g., Paul Erdős and László Lovász, both of whom won the Wolf Prize (in 1983 and 1999, respectively). The CD contains photos of them at a young age.

We hope that having read the problem in English, one will be able to reconstruct its solution from the Hungarian text. Translating the whole KöMaL in English would probably be too big a task for us now, but we are considering it for the future.

For the next few years, we are planning further developments in the KöMaL archives, based on its current database: see www.komal.hu/cd. Our goal is to fill the database with the more than one hundred years of material, and also to be available in English.

References

- [1] KöMaL: Középiskolai Matematikai és Fizikai Lapok, <http://komal.hu>.