

The ‘elmath’ package

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Abstract

This package has been designed to facilitate the use of Greek letters in mathematical mode. The package allows one to directly type in Greek letters to get the Greek letter in math mode.

1 Introduction and Usage

The driving force behind the design of this package was the need to provide a Greek keyboard for usage in math mode. This simply means that users can type in directly Greek characters in math mode and get the expected results. We follow the ISO8859-7 Greek encoding, but we do not support accented letters, as they are useless in math mode.

Users of the package need only a standard ISO8859-7 keyboard, but obviously it is not difficult to adapt the package for other encoding. Note, that one should use the latest version of iso-8859-7.def.

2 The Implementation

Initially, we need to make sure that all the Greek letters are actually active. We assume that \sim is actually an active character.

```
1 (*elmath)
2 \ifcat\noexpand~\noexpand^^e1\relax\else\catcode'\^^e1=\active\fi
3 \ifcat\noexpand~\noexpand^^e2\relax\else\catcode'\^^e2=\active\fi
4 \ifcat\noexpand~\noexpand^^e3\relax\else\catcode'\^^e3=\active\fi
5 \ifcat\noexpand~\noexpand^^e4\relax\else\catcode'\^^e4=\active\fi
6 \ifcat\noexpand~\noexpand^^e5\relax\else\catcode'\^^e5=\active\fi
7 \ifcat\noexpand~\noexpand^^e6\relax\else\catcode'\^^e6=\active\fi
8 \ifcat\noexpand~\noexpand^^e7\relax\else\catcode'\^^e7=\active\fi
9 \ifcat\noexpand~\noexpand^^e8\relax\else\catcode'\^^e8=\active\fi
10 \ifcat\noexpand~\noexpand^^e9\relax\else\catcode'\^^e9=\active\fi
11 \ifcat\noexpand~\noexpand^^ea\relax\else\catcode'\^^ea=\active\fi
12 \ifcat\noexpand~\noexpand^^eb\relax\else\catcode'\^^eb=\active\fi
13 \ifcat\noexpand~\noexpand^^ec\relax\else\catcode'\^^ec=\active\fi
14 \ifcat\noexpand~\noexpand^^ed\relax\else\catcode'\^^ed=\active\fi
15 \ifcat\noexpand~\noexpand^^ee\relax\else\catcode'\^^ee=\active\fi
```

```

16 \ifcat\noexpand~\noexpand^^ef\relax\else\catcode'\^^ef=\active\fi
17 \ifcat\noexpand~\noexpand^^f0\relax\else\catcode'\^^f0=\active\fi
18 \ifcat\noexpand~\noexpand^^f1\relax\else\catcode'\^^f1=\active\fi
19 \ifcat\noexpand~\noexpand^^f3\relax\else\catcode'\^^f3=\active\fi
20 \ifcat\noexpand~\noexpand^^f2\relax\else\catcode'\^^f2=\active\fi
21 \ifcat\noexpand~\noexpand^^f4\relax\else\catcode'\^^f4=\active\fi
22 \ifcat\noexpand~\noexpand^^f5\relax\else\catcode'\^^f5=\active\fi
23 \ifcat\noexpand~\noexpand^^f6\relax\else\catcode'\^^f6=\active\fi
24 \ifcat\noexpand~\noexpand^^f7\relax\else\catcode'\^^f7=\active\fi
25 \ifcat\noexpand~\noexpand^^f8\relax\else\catcode'\^^f8=\active\fi
26 \ifcat\noexpand~\noexpand^^f9\relax\else\catcode'\^^f9=\active\fi
27 \ifcat\noexpand~\noexpand^^c1\relax\else\catcode'\^^c1=\active\fi
28 \ifcat\noexpand~\noexpand^^c2\relax\else\catcode'\^^c2=\active\fi
29 \ifcat\noexpand~\noexpand^^c3\relax\else\catcode'\^^c3=\active\fi
30 \ifcat\noexpand~\noexpand^^c4\relax\else\catcode'\^^c4=\active\fi
31 \ifcat\noexpand~\noexpand^^c5\relax\else\catcode'\^^c5=\active\fi
32 \ifcat\noexpand~\noexpand^^c6\relax\else\catcode'\^^c6=\active\fi
33 \ifcat\noexpand~\noexpand^^c7\relax\else\catcode'\^^c7=\active\fi
34 \ifcat\noexpand~\noexpand^^c8\relax\else\catcode'\^^c8=\active\fi
35 \ifcat\noexpand~\noexpand^^c9\relax\else\catcode'\^^c9=\active\fi
36 \ifcat\noexpand~\noexpand^^ca\relax\else\catcode'\^^ca=\active\fi
37 \ifcat\noexpand~\noexpand^^cb\relax\else\catcode'\^^cb=\active\fi
38 \ifcat\noexpand~\noexpand^^cc\relax\else\catcode'\^^cc=\active\fi
39 \ifcat\noexpand~\noexpand^^cd\relax\else\catcode'\^^cd=\active\fi
40 \ifcat\noexpand~\noexpand^^ce\relax\else\catcode'\^^ce=\active\fi
41 \ifcat\noexpand~\noexpand^^cf\relax\else\catcode'\^^cf=\active\fi
42 \ifcat\noexpand~\noexpand^^d0\relax\else\catcode'\^^d0=\active\fi
43 \ifcat\noexpand~\noexpand^^d1\relax\else\catcode'\^^d1=\active\fi
44 \ifcat\noexpand~\noexpand^^d3\relax\else\catcode'\^^d3=\active\fi
45 \ifcat\noexpand~\noexpand^^d4\relax\else\catcode'\^^d4=\active\fi
46 \ifcat\noexpand~\noexpand^^d5\relax\else\catcode'\^^d5=\active\fi
47 \ifcat\noexpand~\noexpand^^d6\relax\else\catcode'\^^d6=\active\fi
48 \ifcat\noexpand~\noexpand^^d7\relax\else\catcode'\^^d7=\active\fi
49 \ifcat\noexpand~\noexpand^^d8\relax\else\catcode'\^^d8=\active\fi
50 \ifcat\noexpand~\noexpand^^d9\relax\else\catcode'\^^d9=\active\fi

```

Now we define a command that defines all Greek characters as commands, which when expanded produce the expected command.

```

51 \def\el@math{%
52   \def^^e1{\alpha}%
53   \def^^e2{\beta}%
54   \def^^e3{\gamma}%
55   \def^^e4{\delta}%
56   \def^^e5{\epsilon}%
57   \def^^e6{\zeta}%
58   \def^^e7{\eta}%
59   \def^^e8{\theta}%
60   \def^^e9{\iota}%
61   \def^^ea{\kappa}%
62   \def^^eb{\lambda}%

```

```

63 \def^^ec{\mu}%
64 \def^^ed{\nu}%
65 \def^^ee{\xi}%
66 \def^^ef{o}%
67 \def^^f0{\pi}%
68 \def^^f1{\rho}%
69 \def^^f3{\sigma}%
70 \def^^f2{\varsigma}%
71 \def^^f4{\tau}%
72 \def^^f5{\upsilon}%
73 \def^^f6{\phi}%
74 \def^^f7{\chi}%
75 \def^^f8{\psi}%
76 \def^^f9{\omega}%
77 \def^^c1{A}%
78 \def^^c2{B}%
79 \def^^c3{\Gamma}%
80 \def^^c4{\Delta}%
81 \def^^c5{E}%
82 \def^^c6{Z}%
83 \def^^c7{H}%
84 \def^^c8{\Theta}%
85 \def^^c9{I}%
86 \def^^ca{K}%
87 \def^^cb{\Lambda}%
88 \def^^cc{M}%
89 \def^^cd{N}%
90 \def^^ce{\Xi}%
91 \def^^cf{O}%
92 \def^^d0{\Pi}%
93 \def^^d1{P}%
94 \def^^d3{\Sigma}%
95 \def^^d4{T}%
96 \def^^d5{Y}%
97 \def^^d6{\Phi}%
98 \def^^d7{X}%
99 \def^^d8{\Psi}%
100 \def^^d9{\Omega}%
101 }

```

Now, we need to invoke the command `\el@math` every time we enter a math mode. For this reason we redefine the tokens `\everymath` and `\everydisplay` as follows:

```

102 \everymath\expandafter{\the\everymath
103   \relax\el@math}
104 \everydisplay\expandafter{\the\everydisplay
105   \relax\el@math}
106 </elmath>

```

That's all!