The GNU m4 macro processing language

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What is m4?

- Very versatile macro processing tool
- Copies its input to the output, expanding macros along the way
- Code reuse/generation of templates e.g. HTML
- Used by GNU’s autoconf to generate config files
- Generally: text replacement!

Example

```
define(`_latextitle’,
     `\titlehead{$1}
     \authorhead{$2}
     \title{$1}
     \author{$2}’)
     _latextitle(`m4 presentation’,`Anders \and Jens’)

     Result:
     \titlehead{m4 presentation}
     \authorhead{Anders \and Jens}
     \title{m4 presentation}
     \author{Anders \and Jens}
```

Conditionals

- Types of conditionals:
  - ifdef: if defined
  - ifelse: If then [else]

  - recursive and list iterating macros also supported

Example

- ifelse(`Jens’, `Jens’, `Equal’)
  - Result: Equal
- ifelse(`Jens’, `Anders’, 1, `Jens’, `Jens’, 2)
  - Result: 2
- Unlimited number of conditions

Integer arithmetic

- C like syntax
- Operators include
  - +, -, /, *, &&, ||
  - Many more, see documentation
- eval(expression, [radix =10], [width])

Example

- define(`square’, `eval(`$1 ** 2’)’)
  square(5)
  – Result: 25
- eval(‘2 ** (0r2:0111 + 0b1000 - 015)’, 2, 4)
  – Result: 0100

String manipulation

- Simple built-in functions:
  - len(): length of s
  - index(): index of substring in string
  - substr(): return substring
  - translit(): finds occurences of chars and replaces them with other chars
- Regular expressions (emacs syntax)
  - regexp(): index of first match
  - patsubst(): replaces all matches with some string

Example

- regexp(‘This is it!’,‘\<[i]’)
  – Result: 5
- patsubst(‘This is it!’,‘\<[i]’)
  – Result: This s t!
- translit(‘tmf’,‘a-z’,‘Z-A’)
  – Result: GNU

System commands

- Built-in functions to execute scripts
  - syscmd(): executes but does not process/expand output
  - esyscmd(): as above but processes output
  - sysval(): returns exit status of last script
  - maketmp(): creates a temporary file

Example

- define(‘echo’,‘‘echo’ ‘echo’’)
- syscmd(echo)
  – Result: echo
- esyscmd(echo)
  – Result: echo echo