

# moreenum

Seamus Bradley

July 15, 2011

## 1 Basic procedure

At the heart of each new enumeration is the following procedure:

```
\newcommand*{\macro}[1]{%  
  \expandafter\@macro\csname c@#1\endcsname}  
\newcommand*{\@macro}[1]{%  
  \translate{#1}}  
\AddEnumerateCounter{\macro}{\@macro}{distance}
```

From a user perspective, `\macro` takes a counter as its argument and outputs, say, a binary number or whatever you want. Actually, what it really does is turn a counter into a number and pass the number to `\@macro` which does the real work. It takes a number and translates it into the final representation.

Most of the cleverness is done by `\translate` and these are mostly macros I've borrowed from other packages.

The `distance` is the widest entry in the enumeration. `moreenum` hasn't been tested much with this parameter: I've just guessed a bit at what's the widest enumerations are likely to get. Enumerations can *theoretically* get up to 2147483647 items long. Which would be rather a long number.<sup>1</sup>

The `\greek` macro is a little more involved because it involves first defining a macro that turns numbers into Greek letters.

```
\newcommand*{\single@greek}[1]{%  
  \expandafter\@single@greek\csname c@#1\endcsname  
}  
\newcommand*{\@single@greek}[1]{%  
  $\ifcase#1\or\alpha\or\beta\or\gamma\or\delta\or\varepsilon  
    \or\zeta\or\eta\or\theta\or\iota\or\kappa\or\lambda  
    \or\mu\or\nu\or\xi\or o\or\pi\or\varrho\or\sigma  
    \or\tau\or\upsilon\or\phi\or\chi\or\psi\or\omega
```

---

<sup>1</sup>`fmcoun` doesn't seem to work with numbers that big, actually. But even 131071 is 1111111111111111

```
\else\@ctrerr\fi$  
}
```

Then you need to define what to do when you run out of letters. You start again at  $\alpha$ . The clever work there is done by the `alphalph` package.

```
\newalphalph{\@greek}[alph]{\@single@greek}{24}  
\newcommand*{\greek}[1]{%  
  \expandafter\@greek\cename c@#1\endcename  
}  
  
\AddEnumerateCounter{\greek}{\@greek}{\omega$}
```

Some sophistication is required to get the `\translate`-style macros to play nice with `\label` and `\ref` facilities. This can be seen in the following example.

```
\newcommand*{\enumHex}[1]{%  
  \expandafter\@enumHex\cename c@#1\endcename}  
\newcommand*{\@enumHex}[1]{%  
  \protect\Hexadecimalnum{\number#1}}  
\AddEnumerateCounter{\enumHex}{\@enumHex}{AAAA}
```

The `\protect` makes sure the `\Hexadecimalnum` get written to the `.aux` file, rather than expanded first. The `\number` makes sure the number *is* written to the `.aux` file.<sup>2</sup>

## 2 Limitations

The biggest number TeX can handle is 2147483647. I can't imagine this ever being a serious limitation to your enumerating.

There are, however, some further limitations. Certain `fmtcount` macros seem to break before they hit this fundamental limit. In brackets are the `moreenum`-defined enumerations affected.

- `\binary` and friends break at 131072 [`\enumbinary`]
- `\hexadecimal` and friends break at 1048576 [`\enumhex` and `\enumHex`]
- `\numberstring` and friends break at 100000 [`\nwords` and `\nthwords`]

None of these is a serious limitation. If you desperately need bigger enumerations, they are fairly straightforward to define yourself using `binhex` for the numbers and `numname` for the words: these packages don't have these limitations.<sup>3</sup>

---

<sup>2</sup>I'm actually guessing here. I have no idea. I got the clue from `egreg` here: <http://tex.stackexchange.com/q/22234/215>

<sup>3</sup>Why don't I just use those packages instead? Because having `fmtcount` do most of the work means only loading one package instead of 3 (`numname`, `binhex` and `nth` or `engord`).

### 3 Examples of the enumerations

Here are examples of all the kinds of enumeration that the package defines:

`\greek`

$\alpha$  Liberty  
 $\beta$  Equality  
 $\gamma$  Fraternity  
 $\alpha \sigma$  Meaning of life

`\enumHex`

1 Liberty  
 2 Equality  
 3 Fraternity  
 2A Meaning of life

`\enumbinary`

1 Liberty  
 10 Equality  
 11 Fraternity  
 101010 Meaning of life

`\raisenth`

1<sup>st</sup> Liberty  
 2<sup>nd</sup> Equality  
 3<sup>rd</sup> Fraternity  
 42<sup>nd</sup> Meaning of life

`\Nthwords`

One Liberty  
 Two Equality  
 Three Fraternity  
 Forty-Two Meaning of life

`\Greek`

$A$  Liberty  
 $B$  Equality  
 $\Gamma$  Fraternity  
 $A \Sigma$  Meaning of life

`\enumhex`

1 Liberty  
 2 Equality  
 3 Fraternity  
 2a Meaning of life

`\enumoctal`

1 Liberty  
 2 Equality  
 3 Fraternity  
 52 Meaning of life

`\levelnth`

1st Liberty  
 2nd Equality  
 3rd Fraternity  
 42nd Meaning of life

`\Nwords`

First Liberty  
 Second Equality  
 Third Fraternity  
 Forty-Second Meaning of life

## \NTHWORDS

ONE Liberty

TWO Equality

THREE Fraternity

FORTY-TWO Meaning of life

## \nthwords

one Liberty

two Equality

three Fraternity

forty-two Meaning of life

## \NWORDS

FIRST Liberty

SECOND Equality

THIRD Fraternity

FORTY-SECOND Meaning of life

## \nwords

first Liberty

second Equality

third Fraternity

forty-second Meaning of life