[retrieved from http://www.cs.wm.edu/~noonan/Grammar/wirth.html]

Wirth BNF Grammars

Wirth uses his own meta language to define its own syntax (and serve as an example of its use):

```
grammar    = { production }.
production = identifier "=" expression ".".
expression = term { "|" term }.
term       = factor { factor }.
factor     = identifier | literal | "(" expression ")" |
             "[" expression "]" | "{" expression "}".
literal    = """" character { character } """".
```

The word *identifier* is used to denote a nonterminal symbol, and *literal* denotes a terminal symbol. For brevity, *identifier* and *character* are not further defined.

Repetition is denoted by curly braces, i.e., `{ a }` denotes: `empty, a, aa, ...` . Optionality is expressed by square brackets, i.e., `[ a ]` denotes `a` or `empty`. Parentheses merely serve for grouping, i.e., `( a | b ) c` stands for: `a c | b c`.

Terminal symbols are either *literal*s, i.e., are enclosed in quote marks or are *identifier*s which do not appear on the left hand side of the metasymbol `=`. If a quote mark appears a a *literal* itself, then it is written twice (as is common in many programming languages).

As a machine readable form, I have added the following additional properties to Wirth BNF grammars:

- Each production must start on a new line and may not have leading spaces.
- Each symbol, whether meta, terminal, or nonterminal, must be separated from all other symbols by spaces, except the terminating period.
- Productions may be freely continued on a new line; for readability these lines are often indented.
- Grammars may contain comments, which are lines which begin with a `#`, followed by a space. The remainder of the line is ignored.
- Grammars may contain blank lines to improve readability.

Note that the spacing permits convenient processing by simple awk scripts.

References

Niklaus Wirth, What can we do about the unnecessary diversity of notation for syntactic descriptions, *CACM*, 20 (November 1977), pp. 822-823.

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