QLang: Qubit Language

(Reference Manual)

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1 Introduction

2 Lexical conventions

There are five kinds of tokens: identifiers, keywords, constants, expression operators, and other separators. There are six kinds of tokens: identifiers, keywords, constants, strings, expression operators, and other separators. If the input stream has been parsed into tokens up to a given character, the next token is taken to include the longest string of characters which could possibly constitute a token.

Rephrase: that's plagiarism

2.1 Character set

`QLang` supports a subset of ASCII; that is, allowed characters are `a-zA-Z0-9@#,-_;:()[]{}<>=+/|*`, as well as tabulations `\t`, spaces, and line returns `\n` and \r.

2.2 Comments

Comments start with a # sign, which then extends until the next carriage return. Multiline comments are not supported.

2.3 Identifier (names)

An identifier is an arbitrarily long sequence of alphabetic and numeric characters, where `_` is included as "alphabetic". It must start with a lowercase or uppercase letter, i.e. one of `a-zA-Z`.
The language is case-sensitive: `hullabaloo` and `hullABaLoo` are considered as different.

2.4 Keywords

The following identifiers as reserved for keywords, and no one shall use them because it's forbidden and uncool.

`int com mat`	`true false`
`if elif else for from to by while break def`	`Pi e`
`and or xor not`	`transp adj isunit det norm conj exp sin cos tan im re`

2.5 Constants

There are three sorts of constants in the language, namely *integer*, *complex* and *identifier* constants. The first are comprised of any sequence of integers of the form `0|([1-9][0-9]*)` (recall that integers are non-negative), and have type `int`. The second are of type `com` and have the form R`|`R`+`R`i|`R`i` where R consists of a (i) sign, (ii) an integer part followed by (iii) a point, (iv) a decimal part, then (v) either a `e` or a `E` followed by an exponent part, possibly signed. (i) and (v) are optional, and either (ii) or (iv) can be missing as well. In more detail, R is defined as `[+-]{0,1}(((A.B*|.B+)([eE][+-]?B+)?)|A[eE][+-]?B+)` and A =`0|([1-9]B*)`, B =`0|[1-9]` (that is, R matches a real number such as `2.78e5`, `1.5E-1` or `10.25`). Finally, the identifier constants are a subset of the reserved keywords, and include:

check this paragraph.

`e` the base of natural logarithm $e = \sum_{k=0}^{\infty} \frac{1}{k!}$. Equivalent to `exp(1)`; has type `com`.

`Pi` the constant π. Has type `com`.

`true` represents the Boolean value `true`. Stored internally as `int` 1.

`false` represents the Boolean value `false`. Stored internally as `int` 0.

3 Syntax notation

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