Intro to Computing Lab
Paul L. Bailey
Topic 1: BASIC Language Components

Statements

The primary unit of BASIC code is called a *statement*. It typically consists of a command and an argument. A *command* is a verb which instructs the computer to do something. An *argument* to a command is the object corresponding to the verb. For example, the `PRINT` command tells the computer to print something, and the command is followed by what to print.

A *line* in indirect mode consists of a positive integer (the *line number*), following by a space or tab, followed by one or more statements. The statements are separated by colons. The line is terminated with a carriage return (the `<Enter>` key).

Commands

BASIC has a long list of commands, and GWBASIC has been extended to contain even more. These are listed in User's Reference portion of the GWBASIC manual.

We classify the commands into these groups:

(IO) Input/Output: display on a screen and accept input from the keyboard

(Fl) Flow Control: tell the program what statement to do next

(Sy) Symbol Table: manipulate the symbol table

(Di) Direct Mode: statements for direct mode

We list the main commands, and the type of argument they normally take:

`PRINT` *exp*	**IO**	Display characters on the screen
`INPUT` *var*	**IO**	Accept from the keyboard
`CLS`	**IO**	Clear the screen
`COLOR` *exp,exp*	**IO**	Set the text colors
`LET` *var=exp*	**Sy**	Set a variable
`DIM` *var(exp)*	**Sy**	Declare an array
`IF` *exp* `THEN` *stm*	**Fl**	Execute statement if expression is true
`GOTO` *lne*	**Fl**	Jump to a line number
`END`	**Fl**	Terminate execution
`GOSUB` *lne*	**Fl**	Execute a subroutine
`RETURN`	**Fl**	Return from a subroutine
`FOR` *var=exp* `TO` *exp* `STEP` *exp*	**Fl**	Loop on a variable
`NEXT` *var*	**Fl**	End a `FOR` block
`WHILE` *exp*	**Fl**	Loop on a logical expression
`WEND` *exp*	**Fl**	End a `WHILE` block
`LOAD` *exp*	**Di**	Load a program
`SAVE` *exp*	**Di**	Save a program
`RUN`	**Di**	Run the current program
`LIST` *lne-lne*	**Di**	List lines of the current program
`DELETE` *lne-lne*	**Di**	Delete line from the current program
`SYSTEM`	**Di**	Exit GWBASIC

exp=expression, *var*=variable, *lne*=line number, *stm*=statement

Variables

Variables are labels for memory locations where the computer stores temporary information it collects as the program runs. BASIC manages the data type of the memory by using different variable decorations for each type; the decoration is a punctuation at the end of the variable. We list the variable `A`, decorated in each of the four types:

- `A%` Integer
- `A$` String
- `A!` Single Precision Floating Point
- `A#` Double Precision Floating Point

The default type is single precision floating point, so the variable `A` without decoration is interpreted as such.

GWBASIC will sometimes convert between the types when necessary; on other occasions, it displays a `Type mismatch` error message.

Constants

Constants are data which are specified directly in the program. Here are three types, with examples:

- String: `"This is a string"`
- Integer: `123`
- Floating: `1.23`

Constant string are surrounded by quotation marks; otherwise, textual words without quotation marks are interpreted as variable names.

Functions

Functions take information provided to them and produce new information. They are used in expressions like variables.

Operators

Operators combine variables, constants, functions, and expressions if create new expressions.

Expressions

Expressions consist of a well-formed sequence of variables, constants, and functions, with operators between each of these.