

INTRODUCTION TO QBASIC



Computer is a versatile machine capable of performing different tasks, from very simple mathematical operations to complex mathematical calculations and from simple designs to multimedia animations.

Do you think a computer can perform these things on its own?

No, a computer performs these functions by following a series of pre-defined instructions. This set of instructions is called a **program**.



When we plan to go to our friend's house, we first program our mind that how and which route we'll follow. If we miss the route in between, we cannot reach his/her house.

Similarly, a computer cannot directly perform those tasks for which it has not been programmed. It can only follow the instructions specified in the programs and perform the functions accordingly. The persons who create these programs, are known as **programmers or coders**.

The language used by the programmers to write computer programs is called **programming language**. Basic, Fortran, Pascal, Cobol, C, C++ and Java are some examples of programming language.

BASIC AND ITS ADVANTAGES

BASIC is a programming language used for beginners. It is very easy and simple to understand.

BASIC stands for **Beginners All Purpose Symbolic Instruction Code**. It was developed in Dartmouth College, New Hampshire, USA by Professor **John G. Kemeny** and **Thomas E. Kurtz** in May 1964. The popular Basic editions are GW BASIC, BASICA and QBasic.

QBASIC

QBasic is an integrated development environment (IDE), developed by Microsoft to type, edit, debug and execute basic programs.

QBasic is a high level programming language allows us to write programs. Basic uses English like words and mathematical symbols to write programs. Every command or instruction in Basic is called a **Statement**. Statements should be written according to the specific set of rules of the language, which are called '**Syntax**' of the statements. A statement in QBasic consists of three parts:

- **Line Number**
- **Basic Statement**
- **An Optional Comment**



Fact File

John G. Kemeny (R)
and Thomas E. Kurtz (L)

Let's Know More

- ◆ In **Program mode**, commands are not executed immediately and are stored in computer's memory.
- ◆ Line numbers are optional.

Know the Fact

In **Immediate mode**, commands are executed immediately and are not stored in computer memory.



Quick View

F6 key is used to switch from **Program mode** to **Immediate mode** and vice versa.

|| STEPS TO WRITE A PROGRAM IN QBASIC

Let us write a very simple QBasic program.

1. Double-click on the QBasic icon to start QBasic.
2. The QBasic window will appear with a Welcome dialog box.
3. Press the **Esc** key to hide the Welcome dialog box.

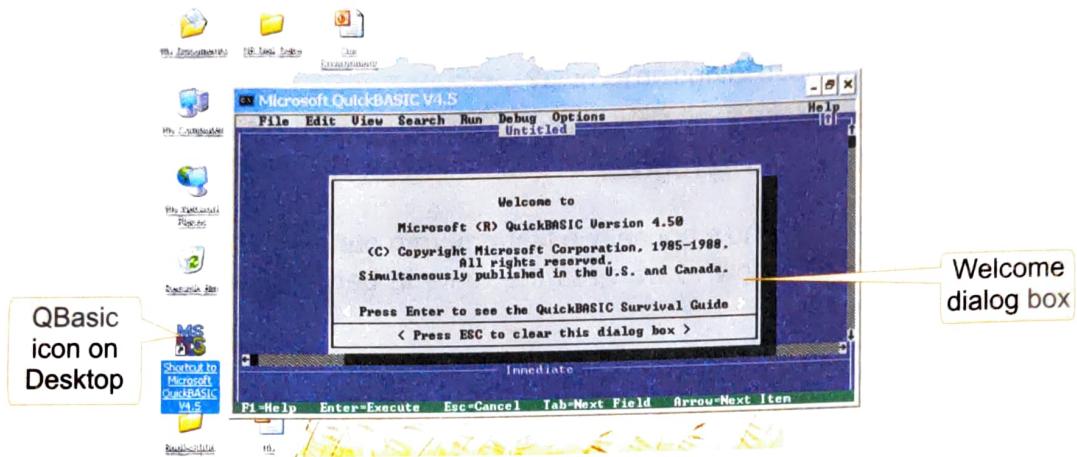


Fig. 10.1: QBasic Welcome Window

4. The first window of QBasic appears.
5. Type the program, as shown in the given picture.

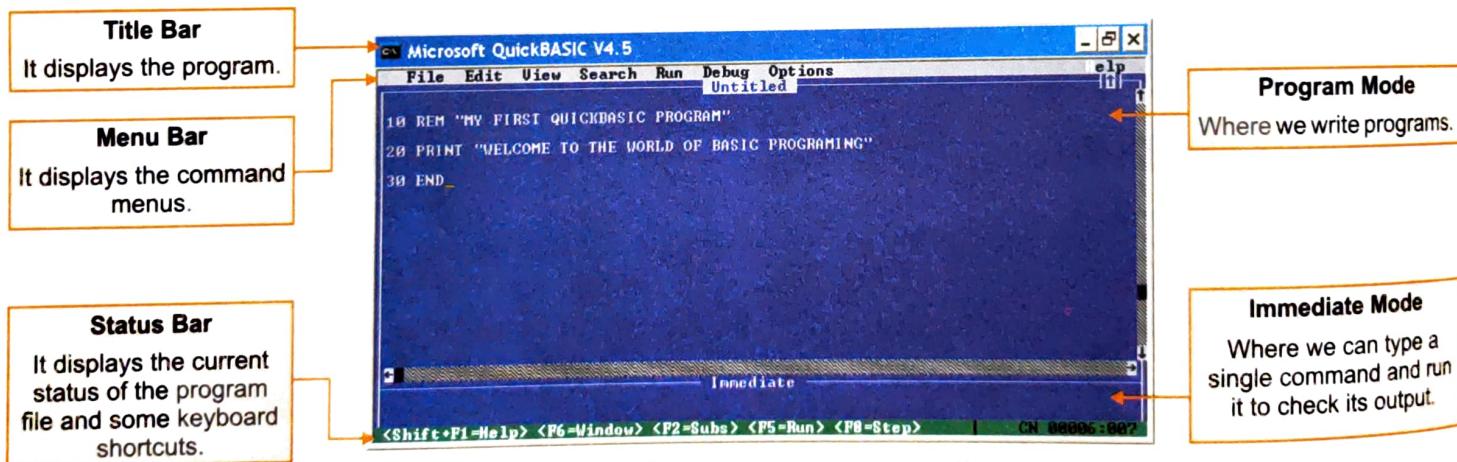


Fig. 10.2: QBasic Program Window

In QBasic, the interpreter executes the program line-by-line. If it finds any error, it displays an error message and stops the execution.

|| SAVE A PROGRAM

Click on the **File** menu and select **Save As** option. Give a meaningful name to your program in the 'File Name': text box and press the Enter key. Your file will be saved with the name given by you and extension **.BAS** will be added to it automatically. The file name should not exceed more than 8 characters.

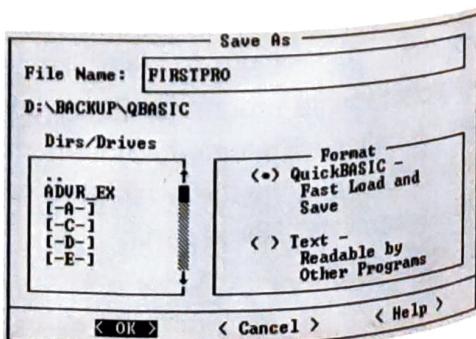


Fig. 10.3: Save As Dialog Box

RUN A PROGRAM

To see the output of a program you need to run the program. There are many ways to run a program in QBasic which are as follows:

- By pressing **F5** key.
- By selecting **Run** menu and clicking on **Start** option.
- By typing **RUN** in the Immediate mode and pressing the **Enter** key.

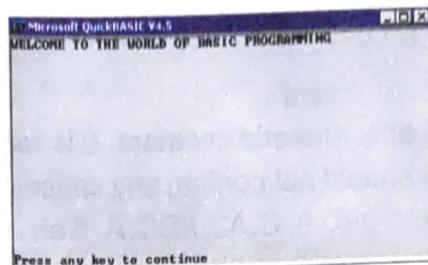


Fig. 10.4: Output Screen

Let's Know More

To start a new program, click on **File** menu and select **New Program** option.



EXIT AND OPEN QBASIC

- To exit a QBasic window, click on **File> Exit**.
- To open an existing program, press **Alt+F** key. The **File** menu will open.
- Highlight **Open** command from the displayed options and press **Enter**.
- Select the program file from the displayed list and press **Enter** key.

CHARACTER SET OF BASIC

A character set is a set of symbols which are used in a programming language. Basic uses the following symbols as its character set.

ALPHABETS	A, B, C, D, E Z a, b, c, d, e, z
NUMBERS	1, 2, 3, 4, 5, 6, 7, 8, 9, 0
SPECIAL CHARACTERS	!, @, #, \$, %, ^, &, *, (,), _, +, , ", /, ?, >, <, ., [,], {, }, etc.

Quick View

Press **Alt + F** key to select **File** menu and press **N** key to select **New Program** option.

Know the Fact

Save As command is used to save a program with a different name and at a different location.

CONSTANTS AND VARIABLES

CONSTANTS

The value which does not change during the execution of the program is called Constant. Constants are of two types:

Numeric Constants

Any numeric value, an integer or a real number, positive or negative is called a Numeric constant. For example: 224, + 12, 0, - 7.4 are valid numeric constants. Numeric constants should not include any special character and are used for calculations.

Alphanumeric Or String Constants

A set of characters is called a String. An alphanumeric or string constant consists of a sequence of characters, A - Z, a - z, 0 - 9 and certain special symbols like % ? # ^ & * () ; : " / \ etc., enclosed in double quotes. String constants are used to represent non-numeric quantities such as names, addresses, etc. For example, "RAGHAV", "SUM = Rs 84", "192" are a few valid string constants.



Let's Know More

Debugging is the process of finding and removing errors in computer programs. **Bugs** mean errors in a program.

VARIABLES

A variable is a location in memory to which any value can be assigned. It continues to hold the value until another value is assigned to it. There are two types of variables :

Numeric Variable

A numeric variable can hold only numeric constant. It is represented by an alphabet or an alphabet followed by another alphabet or a digit. It should not contain any space or symbols like ^, ?, \, /, @, ; etc. Underscore can be used instead of space. For example, A, C, A2, ABC, A_6 etc. represent numeric variables.

Alphanumeric Or String Variable

A string variable is represented by an alphabet followed by the dollar(\$) sign. It can contain letters, digits underscore symbol and the last character is always a dollar (\$) sign. For example, A1\$, RKL\$, COMPU1\$, etc. are valid string variables. A string variable can also store string constant.



A1\$ = "Kips"
(String Variable) (String Constant)

Example The length of a String variable can be maximum 40 characters.

OPERATORS

There are three types of operators in QBasic.

ARITHMETIC OPERATORS

A computer performs many arithmetic operations and calculations with the help of arithmetic operators. The basic arithmetic operators are given here :

Operator	Explanation	Example	Result [Suppose A=8 and B=4]
+	To add two or more numbers	A + B	12
-	To subtract two or more numbers	A - B	4
*	To multiply two or more numbers	A * B	32
/	To divide two or more numbers	A / B	2
^	To calculate Exponentiation value	A ^ 3	512

RELATIONAL OPERATORS

They are used to compare two values using any of the given relational operators from a relational expression:

Operator	Explanation	Example	Result [Suppose A = 10 and B = 8]
=	This operator is used to check the equality between two operands	A = B	False
<>	This operator checks the non-equality between two operands	A <> B	True
>	This operator checks whether the first value is greater than the second value	A > B	True
<	This operator checks whether the first value is less than the second value	A < B	False

$>=$	This operator checks whether the first value is greater than or equal to the second value	$A >= B$	True
$<=$	This operator checks whether the first value is less than or equal to the second value	$A <= B$	False

Let Us Recall

What is Syntax?



LOGICAL OPERATORS

Logical operators are used to perform logical operations on numerical values. Logical operators are used to combine two or more relational expressions and return a single value as TRUE or FALSE in a decision. The common logical operators are: AND, OR, NOT.

Operator	Explanation	Example [Suppose A=10, B=15 and C=20]	Result
AND	This operator returns True only if both the relational expressions are true.	$C > A \text{ AND } C > B$ $A > C \text{ and } B < A$	True False
OR	This operator returns True if at least one of the relational expressions is True.	$B > A \text{ OR } B > C$ $A = C \text{ OR } B = C$	True False
NOT	This operator is used with single relational expression. It returns True if the relational expression returns False and vice versa.	NOT $A > C$ NOT $B < C$	True False

Know the Fact

The operators are executed from left to right in any expression, as per the hierarchy.

HIERARCHY OF OPERATIONS

Hierarchy defines the order in which the operators are executed in any Basic expression. We use BEDMAS for the hierarchy of operation. The full form of BEDMAS is:

B	Brackets	()	
E	Exponentiation	$^$	
D	Division	/	
M	Multiplication	*	Same Priority
A	Addition	+	Same Priority
S	Subtraction	-	

Let's Discuss

Importance of BEDMAS



Solve The Expression:

$12 * 4 + (14+4) + 2^2 - 12/6$ (First, bracket will be solved)

$12 * 4 + 18 + 2^2 - 12/6$ (Then, exponentiation will be performed)

$12 * 4 + 18 + 4 - 12/6$ (Now multiplication and division will be performed)

$48 + 18 + 4 - 2$

(Now addition and subtraction will be performed)

68

(This is the answer.)



Let's Know More

Basic is not a case sensitive language. It means that 'a' and 'A' are same.

|| QBASIC STATEMENTS

REM: This statement is used to give remarks in a program. The computer does not execute this statement since whatever is written after REM is ignored by the computer. REM can be used anywhere and many times in a program. It is a good practice to use REM statement at the start of the program to explain what the program is all about.

Write a QBasic program to display the Bio-data of a student.



Example

```
10 REM TO DISPLAY THE BIO-DATA OF A STUDENT
20 PRINT "ROLL NUMBER : 1"
30 PRINT "NAME : REHAN KHANNA"
40 PRINT "CLASS : VI-A"
50 END
```

PRINT STATEMENT: It is used to display any message or result on the screen. Any text written in double quotes is printed as such. Anything written without quotes is treated as a program component and its value will be displayed.

Syntax : [Line Number] PRINT "Message"

[Line Number] PRINT <Variable Name> (Line numbers are optional)



Example

```
20 PRINT "Welcome to the World of Basic Programming."
It will display the message Welcome to the World of Basic Programming.
PRINTA
It will display the value stored in the variable A.
PRINT
It will leave a blank line.
```

END STATEMENT: It is used to indicate the end of a program. Any statement written after END will not be executed



- ◆ A set of instructions is called a Program.
- ◆ BASIC is a programming language used for beginners. It is very easy and simple to understand.
- ◆ Debugging is the process of finding and removing errors in computer programs.
- ◆ A character set is a set of symbols which are used in a programming language.
- ◆ Logical operators are used to perform logical operations on numerical values.

Brain DEVELOPER

A. Fill in the blanks:

1. The value which does not change during the execution of the program is called
2. A is a set of symbols which are used in a programming language.
3. The hierarchy in which the operators are executed in Basic expression is called

4. Numeric constants contain only
5. String constants must be enclosed within

HINTS

Character set Double Quotes Numeric value BEDMAS Constant

B. State True or False:

1. A String variable is represented by an alphabet followed by dollar (\$) sign.
2. Variables are of three types.
3. Constants are memory locations to store data in it.
4. Numeric constants include all the positive and negative numbers.
5. The variable name must begin with a number.
6. X = 1.3 is a valid statement.
7. 22.4, 43.6 are examples of whole numbers.
8. Addition and subtraction operations come first in Basic hierarchy.

C. Application Based Questions:

1. Mansi wants to write a program to compare two values which are not equal. Suggest to her the operator which displays the non-equality between two operands.
2. Ritika has written a program in QBasic. She wants to run the program using the shortcut key. Suggest the shortcut key to run a program.

D. Multiple Choice Questions:

1. sign is added at the end of a String variable.
a. \$ b. & c. %
2. Which is the correct numeric expression?
a. A="5*5" b. A1\$=52 c. A2= 21
3. key is used to switch from one mode to other in QBasic.
a. F5 b. F6 c. F8
4. The extension of a QBasic program file is
a. .QB b. .Qbas c. .Bas
5. To hide the welcome dialog box, press key.
a. Ctrl b. Esc c. Alt

E. Answer the following in one word or one sentence:

1. What is the full form of BASIC?
.....
2. What are the different types of constants?
.....
3. Give two examples of numeric and alphanumeric constants.
.....
4. Which operator is used to represent 'less than equal to' condition in Basic?
.....
5. Which statement is used to display the output on the screen?
.....
6. What are the types of operators in QBasic?
.....
7. Who developed BASIC?
.....

F. Answer the following:

1. Define Basic language.
.....
.....
.....
2. Write the different ways to run a QBasic program.
.....
.....
3. Define variable. Name the types of variables.
.....
.....
.....
4. Differentiate Numeric and Alphanumeric Constant.
.....
.....
.....
5. Define the term Hierarchy of operations. Write the hierarchical order of the arithmetic operators in QBasic.
.....
.....
.....

ACTIVITY SECTION

LAB SESSION

Perfection Through



Write QBasic programs for the following:

- ◆ To display a simple message "WISH YOU A GOOD DAY".
- ◆ To print the entrance form with the titles as: Name, Age, Father's name, Occupation, Address and Contact number.
- ◆ To display thought for the day:
"Success is a MARATHON, its not a SPRINT".

Write the answers of these as per Basic hierarchy:

1. $-5^2 + [(-3^2 + 2^2) + (4^2 - 4)]$
2. $4^3 - [9^2 - \{5^3 - (2 - 7^2) + 6\}]$
3. $-4(2+1)+2(3-1^3)+4^2-7$
4. $2^3 + 4^3 + (-3^3) + 9(2)(-3)$
5. $85 - [12^2 + 7(8^2 - 3) - 2\{10 - 5(3^2 - 2^2)\}]$
6. $15 - [8^3 + 3^2 - \{8^2 - (4 \cdot 2 + 2^3) - 5^3\} - 2^2]$

Correct the following:

1. CITY = "ALLAHABAD"
2. A = 15
3. B\$ = "100 + 10"
4. MONTH = AUGUST
5. 2A% = 60
6. 60 / 100 = MARKS

GROUP DISCUSSION

For Concept Clarity



Divide the class in two groups and conduct a group discussion on the topic:
Constants vs Variables.

ONLINE LINK

Looking For More

To know more about the basics of QBasic, visit the site:
www.svatopluk.com/qbtutor/tut2.htm

