

Supplement For

C Programming

Version – 2 (05-05-2020)

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Block Diagram of Typical Computer

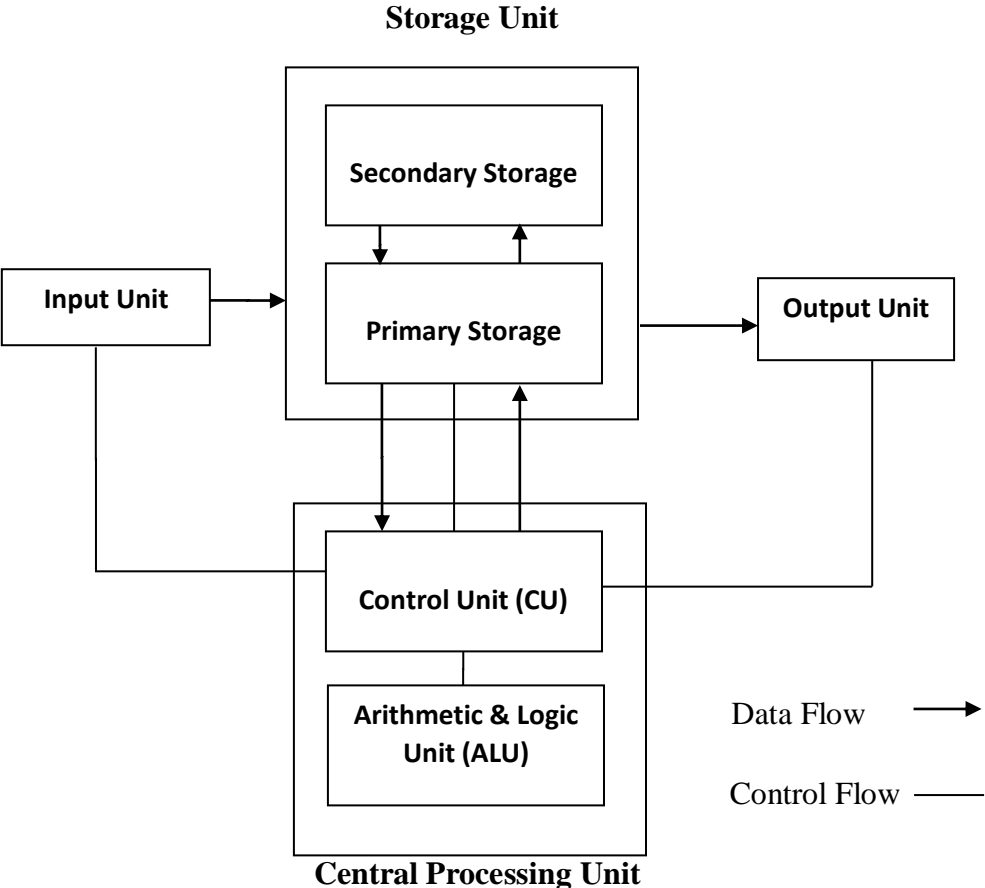


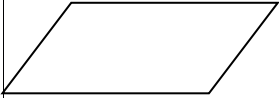
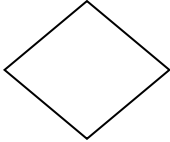


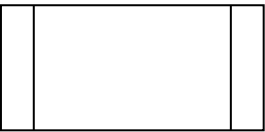



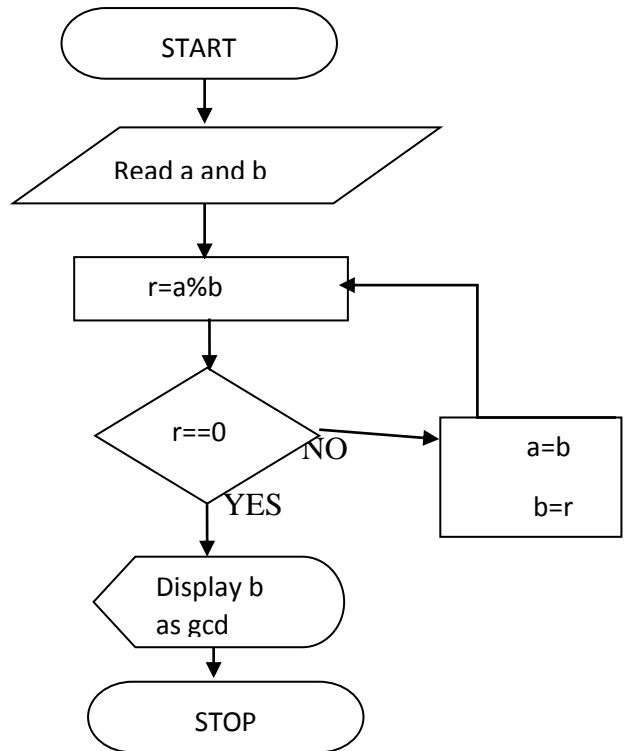
Fig. The block diagram of typical computer system

Flowcharts

Basic Flowchart Symbols

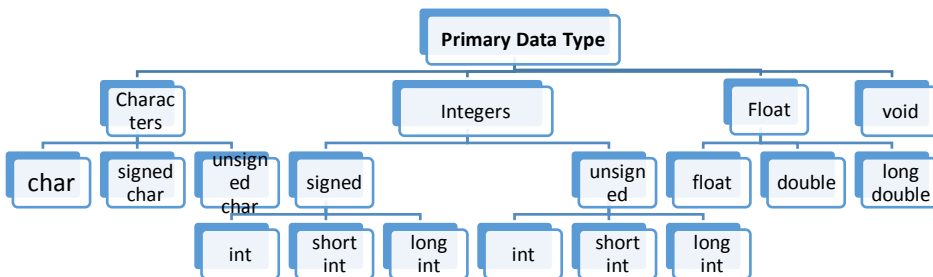
Sr.No	Symbol	Name	Use
1		Oval/Terminator	Start and End of Algorithm
2		Rectangle	Process, Assignment Statements
3		Parallelogram	Input/Output
4		Rhombus Diamond	/ Making Decisions (if, then, else)
5		Circle	Connector
6		Arrows	Direction of the flow of Control
7		Predefined Process	Predefined Process. Such as subroutine or module
8		Display	Display of Information

Flow Chart for GCD Program (using Euclid's algorithm)



Primary Data Types

Primary Data Types are again classified as below



Summary of Primary Data Types:

Data Type	Formula	Range for 16 bit machine	Size	FS
signed char	$-(2^{8-1})$ to $+(2^{8-1})-1$	-128 to +127	1	%c
unsigned char	0 to $+(2^8)-1$	0 to 255	1	%c
short signed int	$-(2^{16-1})$ to $+(2^{16-1})-1$	-32768 to +32767	2	%d
short unsigned int	0 to $+(2^{16})-1$	0 to 65535	2	%u
signed int	$-(2^{16-1})$ to $+(2^{16-1})-1$	-32768 to +32767	2	%d
unsigned int	0 to $+(2^{16})-1$	0 to 65535	2	%u
long signed int	$-(2^{32-1})$ to $+(2^{32-1})-1$	-2147483648 to +2147483647	4	%ld
long unsigned int	0 to $+(2^{32})-1$	0 to 4294967295	4	%lu
Float		-3.4e38 to +3.4e38	4	%f
Double		-1.7e308 to +1.7e308	8	%lf
long double		-1.7e4932 to +1.7e4932	10	%Lf

FS: Format Specifier Note: Above values are for 16 bit machine. Sizes are in bytes.

Note: Why 2^{16-1} and 2^{16} ?? The 16th bit is used to store the sign of the integer. bit 1 is for negative and bit 0 is for positive. For 32 bit machine 32nd bit is used to store sign.

Precedence and Associativity of Operators

What is BODMAS rule? In mathematics to simplify an expression the BODMAS rule is followed. It means BODMAS rule decides the order of operations in mathematics. In C programming if you encounter expressions involving multiple operations, then you need to simplify the expressions using following operator's precedence and associativity. Operator precedence means to which operator we need to give highest priority. If two operators are having same order of precedence (means same priority) then the associativity comes into picture. Associativity tells in which order two operators of same precedence need to be evaluated. The associativity of any operator is either from left to right or from right to left.

P: Priority; O: Operator

P	O	Name	Associativity
1	()	Grouping Operator	Left to Right
	[]	Array Subscript	
	.	Structure Member	
	->	Structure Pointer	
	++, --	Increment, Decrement (Postfix)	
2	++, --	Increment, Decrement (Prefix)	Right to Left
	+, -	Unary Plus/ Unary Minus	
	(type)	Type conversion	
	!	Negation	
	*	Value at	
	&	Address of	
	sizeof	sizeof operator	
	~	One's Complement	
3	*,/,%	Multiplication/Division/Modulus	Left to Right
4	+, -	Addition, Subtraction	Left to Right
5	<<, >>	left shift, right shift	Left to Right
6	<, <=, >, >=	less than, less than or equal to, greater than, greater than or equal to	Left to Right
7	==, !=	is equal to, is not equal to	Left to Right
8	&	Bitwise AND	Left to Right
9	^	Bitwise exclusive OR	Left to Right

10		Bitwise Inclusive OR	Left to Right
11	&&	Logical AND	Left to Right
12		Logical OR	Left to Right
13	? :	Conditional/Ternary	Right to Left
14	=	Assignment	Right to Left
	+=, -=	Addition/Subtraction	
	*=, /=	Multiplication/Division Assignment	
	%=	Modulus Assignment	
	&=	Bitwise AND Assignment	
	^=	Bitwise Exclusive OR Assignment	
	=	Bitwise Inclusive OR Assignment	
	<<=	Left/Right shift Assignment	
15	,	comma	Left to Right

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