Variables

A variable is a container (storage area) used to hold data.
Each variable should be given a unique name (identifier).

int a=2;

Here a is the variable name that holds the integer value 2.
The value of a can be changed, hence the name variable.

There are certain rules for naming a variable in C++

1. Can only have alphabets, numbers and underscore.
2. Cannot begin with a number.
3. Cannot begin with an uppercase character.
4. Cannot be a keyword defined in C++ language (like int is a keyword).

Fundamental Data Types in C++

Data types are declarations for variables. This determines the type and size of data associated with variables which is essential to know since different data types occupy different size of memory.

Data Type	Meaning	Size (in Bytes)
int	Integer	4
float	Floating-point	4
double	Double Floating-point	8
char	Character	1
wchar_t	Wide Character	2
bool	Boolean	1
void	Empty	0

APNI KAKSHA

Apni Kaksha

1. int

- This data type is used to store integers.
- It occupies 4 bytes in memory.
- It can store values from -2147483648 to 2147483647.

Eg. int age = 18

2. float and double

- Used to store floating-point numbers (decimals and exponentials)
- Size of float is 4 bytes and size of double is 8 bytes.
- Float is used to store upto 7 decimal digits whereas double is used to store upto 15 decimal digits.

Eg. float pi = 3.14
double distance = 24E8 // 24 x 10^8

3. char

- This data type is used to store characters.
- It occupies 1 byte in memory.
- Characters in C++ are enclosed inside single quotes ‘ ‘.
- ASCII code is used to store characters in memory.

Eg. char ch = ‘a’;

ASCII Table

0	?	1	?	2	?	3	?	4	?	5	?	6	?	7	?
8	?	9	?	10	?	11	?	12	?	13	?	14	?	15	?
16	?	17	?	18	?	19	?	20	?	21	?	22	?	23	?
24	?	25	?	26	?	27	?	28	?	29	?	30	?	31	?
32		33	!	34	"	35	#	36	$	37	%	38	&	39	'
40	(	41	)	42	*	43	+	44	,	45	-	46	.	47	/
48	0	49	1	50	2	51	3	52	4	53	5	54	6	55	7
56	8	57	9	58	:	59	;	60	<	61	=	62	>	63	?
64	@	65	A	66	B	67	C	68	D	69	E	70	F	71	G
72	H	73	I	74	J	75	K	76	L	77	M	78	N	79	O
80	P	81	Q	82	R	83	S	84	T	85	U	86	V	87	W
88	X	89	Y	90	Z	91	[	92	\	93	]	94	^	95	_
96	`	97	a	98	b	99	c	100	d	101	e	102	f	103	g
104	h	105	i	106	j	107	k	108	l	109	m	110	n	111	o
112	p	113	q	114	r	115	s	116	t	117	u	118	v	119	w
120	x	121	y	122	z	123	{	124	|	125	}	126	~		

4. bool

- This data type has only 2 values – true and false.
- It occupies 1 byte in memory.
- True is represented as 1 and false as 0.

Eg. bool flag = false

APNI KAKSHA

C++ Type Modifiers

Type modifiers are used to modify the fundamental data types.

Data Type	Size (in Bytes)	Meaning
signed int	4	used for integers (equivalent to int)
unsigned int	4	can only store positive integers
short	2	used for small integers (range -32768 to 32767)
long	at least 4	used for large integers (equivalent to long int)
long long int	8	used for very large integers (equivalent to long long int).
unsigned long long	8	used for very large positive integers or 0 (equivalent to unsigned long long int)
long double	8	used for large floating-point numbers
signed char	1	used for characters (guaranteed range -127 to 127)
unsigned char	1	used for characters (range 0 to 255)

Derived Data Types

These are the data types that are derived from fundamental (or built-in) data types. For example, arrays, pointers, function, reference.

User-Defined Data Types

These are the data types that are defined by user itself.
For example, class, structure, union, enumeration, etc.

We will be studying the derived and user-defined data types in detail in the further video lectures.

APNI KAKSHA

Apni Kaksha