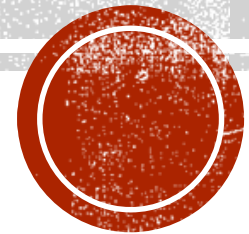# DATA TYPE: STRING

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Programming Club

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BEFORE STRING: CHARACTER

- What is a character?
  - '1' '2' '3'
  - 'A'
  - 'a'
  - '?'
  - '\n'
  - ' '

ASCII CHARACTER CODES CHART

Ctrl	Dec	Hex	Char	Code		Dec	Hex	Char		Dec	Hex	Char		Dec	Hex	Char
^@	0	00		NUL		32	20			64	40	@		96	60	'
^A	1	01		SOH		33	21	!		65	41	A		97	61	a
^B	2	02		STX		34	22	"		66	42	B		98	62	b
^C	3	03		ETX		35	23	#		67	43	C		99	63	c
^D	4	04		EOT		36	24	$		68	44	D		100	64	d
^E	5	05		ENQ		37	25	%		69	45	E		101	65	e
^F	6	06		ACK		38	26	&		70	46	F		102	66	f
^G	7	07		BEL		39	27	'		71	47	G		103	67	g
^H	8	08		BS		40	28	(		72	48	H		104	68	h
^I	9	09		HT		41	29	)		73	49	I		105	69	i
^J	10	0A		LF		42	2A	*		74	4A	J		106	6A	j
^K	11	0B		VT		43	2B	+		75	4B	K		107	6B	k
^L	12	0C		FF		44	2C	`		76	4C	L		108	6C	l
^M	13	0D		CR		45	2D	–		77	4D	M		109	6D	m
^N	14	0E		SO		46	2E	.		78	4E	N		110	6E	n
^O	15	0F		SI		47	2F	/		79	4F	O		111	6F	o
^P	16	10		DLE		48	30	0		80	50	P		112	70	p
^Q	17	11		DC1		49	31	1		81	51	Q		113	71	q
^R	18	12		DC2		50	32	2		82	52	R		114	72	r
^S	19	13		DC3		51	33	3		83	53	S		115	73	s
^T	20	14		DC4		52	34	4		84	54	T		116	74	t
^U	21	15		NAK		53	35	5		85	55	U		117	75	u
^V	22	16		SYN		54	36	6		86	56	V		118	76	v
^W	23	17		ETB		55	37	7		87	57	W		119	77	w
^X	24	18		CAN		56	38	8		88	58	X		120	78	x
^Y	25	19		EM		57	39	9		89	59	Y		121	79	y
^Z	26	1A		SUB		58	3A	:		90	5A	Z		122	7A	z
^[	27	1B		ESC		59	3B	;		91	5B	[		123	7B	{
^\	28	1C		FS		60	3C	<		92	5C	\		124	7C	|
^]	29	1D		GS		61	3D	=		93	5D	]		125	7D	}
^^	30	1E	▲	RS		62	3E	>		94	5E	^		126	7E	~
^-	31	1F	▼	US		63	3F	?		95	5F	_		127	7F	⌂

* ASCII code 127 has the code DEL. Under MS-DOS, this code has the same effect as ASCII 8 (BS).

WHAT IS A STRING?

- String is actually a character array:

- Ex.

- "ABCDEFG"

- "Hello world!"

- "Hi, My name is …"

DEFINE CHARACTER TYPE IN C++

```cpp
char ch;    //define one character
ch = 'A';   //give value to character
ch = 'a';
ch = '2';
ch = '\n';
ch = ' ';


char ch[1024];  //define a character array
ch[1] = 'A';   //give value to character array
ch[2] = 'a';
ch[3] = '2';
ch[4] = '\n';
ch[5] = ' ';
```

DEFINE STRING IN C++

- string s; //define a new string

- s = "Hello, world!" // be sure to use "" for string, '' for character

- cin >> s; // input a string

- cout << s << endl; // output a string

BECAUSE STRING IS AN ARRAY...

Index	0	1	2	3	4	5
Variable	H	e	l	l	o	\0
Address	0x23451	0x23452	0x23453	0x23454	0x23455	0x23456

- Ex.
- string s = "Hello world!"
- If we want to know which character is on the position 3,
- cout << s[3] << endl; // Ans: 'l'

BASIC MEMBER FUNCTIONS IN C++ STRING

- string s;

- int len = s.size(); // find the length of string(# of characters inside the string)

- bool flag = s.empty(); // return value: true of false represent if the string is empty

- s.clear(); // clean all the elements in side the string

- s.erase(pos, len) //pos: postion of the first character to be erased. Num: number of characters to erase

- string substring = s.substr(pos, len); //pos: postion of the first character to be copied as a substring. Num: number of characters to include in the substring

- Add two strings: s1& s2;

- What's s1 + s2?

- s1 + s2 = put s2 behind s1.

AN EASY PRACTICE

- Now you need to write code to introduce you to the world. Your task needs to include following functions:

1. Input your name

2. print your name

3. print your name one character per line

4. Print your first name, last name, grade, school, each character per line.

5. print your first name, space, last name, space, grade, space, school. (Ex. Ronny Chen 11 Pittsford Sutherland High School)