

24/10/20

Pointers, Files & Strings

https://www.tutorialspoint.com/cprogramming/c_pointers.htm#:~:text=A%20pointer%20is%20a%20variable,to%20store%20any%20variable%20address.

<https://beginnersbook.com/2014/01/c-pointers/>

<https://www.programiz.com/c-programming/library-function/ctype.h/isalpha>

In C the * operator (in regards to pointers) is used to turn a memory address into a variable.

In C the & operator (in regards to pointers) is used to return the address of a piece of information in memory.

An integer array can be passed as an argument to a function by giving the first address of the array as a pointer, like so:

```
void func(int *point, array_size);
```

The function can then use a for loop to update every position in the array, like so:

```
for (int i = 0; i < array_size; i++)  
{  
    *(pop + i) = rand();  
}
```

FILE is a data type to assigns files from another location to memory.

fopen() is a function that gets you a file pointer.

fclose() is a function that clears the memory of information from the file pointer.

fgetc() is a function that gets a character from a file, and moves the position in the file along one.

EOF stands for end of file and is an ASCII character (hex value: 0x00) that signifies the end of a file's information.

```
F: > 1201_Programming > c4 > C file_reader.c > ...
1  #include <stdio.h>
2
3  int main()
4  {
5      FILE *fp;
6      fp = fopen("file.txt", "r"); //Opens file for reading
7
8      for (;;)
9      {
10         if (feof(fp)) //Makes sure it is not end of the file
11         {
12             break;
13         }
14         printf("%c", fgetc(fp)); //reads value from file, prints value, and position along
15     }
16     fclose(fp);
17 }
```

isalpha() and toupper() are from the <ctype.h> library, a library for character processing.

isalpha() is a function that defines what type of character is read.

isalpha() == 0; means it is a non-alphabetic character

isalpha() == 1; means it is an uppercase letter

isalpha() == 2; means it is a lowercase letter

toupper() is a functions that changes a lowercase letter into an uppercase letter

ASCII TABLE

Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char
0	0	[NULL]	32	20	[SPACE]	64	40	@	96	60	`
1	1	[START OF HEADING]	33	21	!	65	41	A	97	61	a
2	2	[START OF TEXT]	34	22	"	66	42	B	98	62	b
3	3	[END OF TEXT]	35	23	#	67	43	C	99	63	c
4	4	[END OF TRANSMISSION]	36	24	\$	68	44	D	100	64	d
5	5	[ENQUIRY]	37	25	%	69	45	E	101	65	e
6	6	[ACKNOWLEDGE]	38	26	&	70	46	F	102	66	f
7	7	[BELL]	39	27	'	71	47	G	103	67	g
8	8	[BACKSPACE]	40	28	(	72	48	H	104	68	h
9	9	[HORIZONTAL TAB]	41	29	)	73	49	I	105	69	i
10	A	[LINE FEED]	42	2A	*	74	4A	J	106	6A	j
11	B	[VERTICAL TAB]	43	2B	+	75	4B	K	107	6B	k
12	C	[FORM FEED]	44	2C	,	76	4C	L	108	6C	l
13	D	[CARRIAGE RETURN]	45	2D	-	77	4D	M	109	6D	m
14	E	[SHIFT OUT]	46	2E	.	78	4E	N	110	6E	n
15	F	[SHIFT IN]	47	2F	/	79	4F	O	111	6F	o
16	10	[DATA LINK ESCAPE]	48	30	0	80	50	P	112	70	p
17	11	[DEVICE CONTROL 1]	49	31	1	81	51	Q	113	71	q
18	12	[DEVICE CONTROL 2]	50	32	2	82	52	R	114	72	r
19	13	[DEVICE CONTROL 3]	51	33	3	83	53	S	115	73	s
20	14	[DEVICE CONTROL 4]	52	34	4	84	54	T	116	74	t
21	15	[NEGATIVE ACKNOWLEDGE]	53	35	5	85	55	U	117	75	u
22	16	[SYNCHRONOUS IDLE]	54	36	6	86	56	V	118	76	v
23	17	[ENG OF TRANS. BLOCK]	55	37	7	87	57	W	119	77	w
24	18	[CANCEL]	56	38	8	88	58	X	120	78	x
25	19	[END OF MEDIUM]	57	39	9	89	59	Y	121	79	y
26	1A	[SUBSTITUTE]	58	3A	:	90	5A	Z	122	7A	z
27	1B	[ESCAPE]	59	3B	;	91	5B	[	123	7B	{
28	1C	[FILE SEPARATOR]	60	3C	<	92	5C	\	124	7C	|
29	1D	[GROUP SEPARATOR]	61	3D	=	93	5D	]	125	7D	}
30	1E	[RECORD SEPARATOR]	62	3E	>	94	5E	^	126	7E	~
31	1F	[UNIT SEPARATOR]	63	3F	?	95	5F	_	127	7F	[DEL]

A caesar cipher is a cipher that shifts values by a set amount (traditionally by three places to the left). It is usually attributed to being invented by Julius Caesar, hence the name.

In C the % operator (in regards to pointers) is used to return the modulus of a value.