


4 Data Types and Expression Lectures - Week 2 - Data Types and Expressions - Introduction to Programming in C++ - edX\_3ts - VLC media player

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# The char Data Type

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Data	Expressions	Control Flow
<ul style="list-style-type: none"><li>• int</li><li>• float</li><li>• double</li><li>• char</li></ul>	<ul style="list-style-type: none"><li>• I/O expressions</li><li>• Arithmetic expressions</li></ul>	<ul style="list-style-type: none"><li>• Sequential</li></ul>



00:17 24:23

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# The char Data Type

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Kind of data: Characters

Inner representation:

- Each char data uses 1 byte (8 bits)




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# The char Data Type

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

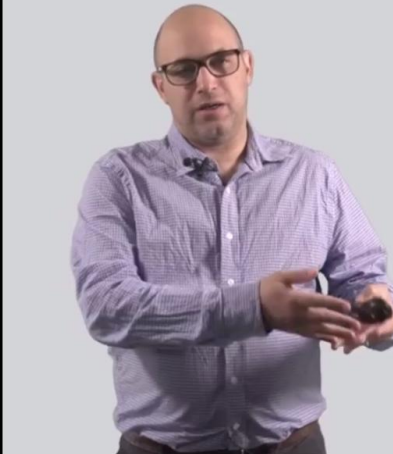
02:20

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# The char Data Type

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ASCII Value → 'a' → 97

$(97)_{10} = (01100001)_2$

30  
0

Memory

02:55

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EN 7:26 PM 26-May-21

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# The char Data Type

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Kind of data: Characters

Inner representation:


- Each char data uses 1 byte (8 bits)
- The characters are mapped to numbers by the ASCII table, which are then represented in binary

03:13 24:23

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# What's My ASCII Value?

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Write a program that reads from the user a single character, and prints it's ASCII value.

Example  
Please enter a character:  
T  
The ASCII value of T is 84

03:50 24:23


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# char Literals

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Kind of data: Characters

Inner representation:

- Each char data uses 1 byte (8 bits)
- The characters are mapped to numbers by the ASCII table, which are then represented in binary

C++ literals:


07:39 24:23

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# char Literals

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Kind of data: Characters

Inner representation:

- Each char data uses 1 byte (8 bits)
- The characters are mapped to numbers by the ASCII table, which are then represented in binary

C++ literals: 'a', 'B', '3', '\$'


08:40 24:23

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# char Literals

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```
int main() {  
    char ch;  
  
    ch = 'a';  
  
    cout<<'b'<<endl;  
  
    ch = "a";  
    return 0;  
}
```


09:20 24:23

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# char Literals

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```
int main() {  
    char ch;  
  
    cout<<'\\n';  
    cout<<endl;  
  
    ch = '\\n';  
    cout<<ch;  
  
    cout<<"abc"<<'\\n';  
  
    return 0;  
}
```

11:14 24:23



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# char Literals


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Kind of data: Characters

Inner representation:

- Each char data uses 1 byte (8 bits)
- The characters are mapped to numbers by the ASCII table, which are then represented in binary

C++ literals: 'a', 'B', '3', '\$', '\n'




10:33 24:23

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# char Literals

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```
int main() {  
    char ch;  
  
    cout<<' \n' ;  
    cout<<endl;  
  
    ch = ' \n' ;  
    cout<<ch;  
  
    cout<<"abc"<<' \n' ;  
    cout<<"abc\n";  
  
    return 0;  
}
```



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# char Literals


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Kind of data: Characters

Inner representation:

- Each char data uses 1 byte (8 bits)
- The characters are mapped to numbers by the ASCII table, which are then represented in binary

C++ literals: 'a', 'B', '3', '\$', '\n', '\t', '\\', ...



12:14 24:23


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# char Literals

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```
int main() {  
    char ch1, ch2;  
  
    ch1 = 'a';  
    ch2 = 'a' + 1;  
  
    cout<<ch2<<endl;  
    cout<<'a' + 1<<endl;  
  
    return 0;  
}
```




13:43 24:23

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# char Literals

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```
int main() {
    char ch1, ch2;

    ch1 = 'a';
    ch2 = 'a' + 1;

    cout<<ch2<<endl;
    cout<<'a' + 1<<endl;
    cout<<(char)('a' + 1)<<endl;

    return 0;
}
```


15:28 24:23

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# char Literals

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Kind of data: Characters

Inner representation:

- Each char data uses 1 byte (8 bits)
- The characters are mapped to numbers by the ASCII table, which are then represented in binary

C++ literals: 'a', 'B', '3', '\$', '\n', '\t', '\\', ...

Arithmetic Operators: +, -, =

16:03 24:23



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# Convert to UPPER CASE

Write a program that reads from the user a lower case letter, and prints it's corresponding upper case letter.

Example

Please enter a lower case letter:

t

The upper case of t is T

16:40
24:23

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# Convert to UPPER CASE

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


16:59
24:23

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# Convert to UPPER CASE

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

17:23


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# The string Class

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Data	Expressions	Control Flow
<ul style="list-style-type: none"><li>• int</li><li>• float</li><li>• double</li><li>• char</li><li>• string</li></ul>	<ul style="list-style-type: none"><li>• I/O expressions</li><li>• Arithmetic expressions</li></ul>	<ul style="list-style-type: none"><li>• Sequential</li></ul>

20:50

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# The string Class

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Note: **string** is not a C++ built-in type. To use it you need to have:  
**#include<string>**



21:01 24:23

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# The string Class


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Note: **string** is not a C++ built-in type. To use it you need to have:  
**#include<string>**

Kind of data: Strings/Text

Inner representation: Sequence of characters

C++ literals: "abc", "This is a string\n", ...




22:15 24:23

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# The string Class

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Note: **string** is not a C++ built-in type. To use it you need to have:  
**#include<string>**

Kind of data: Strings/Text

Inner representation: Sequence of characters

C++ literals: "abc", "This is a string\n", ...

Arithmetic Operators: +, =


22:37

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# The string Class

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```
#include <iostream>
#include <string>
using namespace std;

int main(){
    int x;
    double y;
    string s;

    x = 5;
    y = 7.3;
    s = "Hello";

    cout<<s<<endl;

    cout<<s + " world"<<endl;

    s = s + " world";
    cout<<s<<endl;

    return 0;
}
```

24:00