

Microsoft Visual Studio Debug

Console Shenanigans

Week 2

```
C:\Users\brend\source\repos\VGATestProject\x64\Release\VGATestProject.exe (process 70484) exited with code 0.  
Press any key to close this window . . .
```

Encoding



ASCII

Dec	Hx	Oct	Char	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr	Dec	Hx	Oct	Html	Chr
0	0 000		NUL (null)	32	20	040	 	Space	64	40	100	@	Ø	96	60	140	`	`
1	1 001		SOH (start of heading)	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2 002		STX (start of text)	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3 003		ETX (end of text)	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4 004		EOT (end of transmission)	36	24	044	$	\$	68	44	104	D	D	100	64	144	d	d
5	5 005		ENQ (enquiry)	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6 006		ACK (acknowledge)	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7 007		BEL (bell)	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8 010		BS (backspace)	40	28	050	((72	48	110	H	H	104	68	150	h	h
9	9 011		TAB (horizontal tab)	41	29	051))	73	49	111	I	I	105	69	151	i	i
10	A 012		LF (NL line feed, new line)	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
11	B 013		VT (vertical tab)	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
12	C 014		FF (NP form feed, new page)	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
13	D 015		CR (carriage return)	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
14	E 016		SO (shift out)	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
15	F 017		SI (shift in)	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
16	10 020		DLE (data link escape)	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
17	11 021		DC1 (device control 1)	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12 022		DC2 (device control 2)	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13 023		DC3 (device control 3)	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14 024		DC4 (device control 4)	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15 025		NAK (negative acknowledge)	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16 026		SYN (synchronous idle)	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
23	17 027		ETB (end of trans. block)	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
24	18 030		CAN (cancel)	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19 031		EM (end of medium)	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
26	1A 032		SUB (substitute)	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
27	1B 033		ESC (escape)	59	3B	073	;	;	91	5B	133	[[123	7B	173	{	{
28	1C 034		FS (file separator)	60	3C	074	<	<	92	5C	134	\	\	124	7C	174	|	
29	1D 035		GS (group separator)	61	3D	075	=	=	93	5D	135]]	125	7D	175	}	}
30	1E 036		RS (record separator)	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
31	1F 037		US (unit separator)	63	3F	077	?	?	95	5F	137	_	_	127	7F	177		DEL

Source: www.LookupTables.com

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Extended ASCII

128	Ç	144	É	160	á	176	¤	192	Ł	208	₩	224	¤	240	≡
129	ü	145	æ	161	í	177	¤¤	193	ł	209	₩₩	225	ß	241	±
130	é	146	Æ	162	ó	178	¤¤¤	194	₺	210	₩₩₩	226	Γ	242	≥
131	â	147	ö	163	ú	179		195	₺	211	₩₩₩₩	227	π	243	≤
132	ä	148	ö	164	ñ	180	+	196	-	212	₺₺	228	Σ	244	₹
133	à	149	ò	165	Ñ	181	+	197	+	213	₺₺₺	229	σ	245	Ј
134	å	150	û	166	»	182		198	₺	214	₺₺₺₺	230	μ	246	÷
135	ç	151	ù	167	°	183	₩	199	₩	215	₩₩₩₩₩	231	τ	247	₪
136	è	152	ÿ	168	¸	184	₩	200	₺	216	+	232	Φ	248	◦
137	ë	153	Ö	169	Ր	185	₩	201	Ր	217	Ј	233	◎	249	.
138	è	154	Ü	170	Ր	186	₩	202	₩₩	218	Ր	234	Ω	250	.
139	í	155	¢	171	½	187	₩	203	₩	219	■	235	δ	251	√
140	î	156	£	172	¼	188	Ј	204	₩	220	■	236	∞	252	¤
141	í	157	⌘	173	¡	189	Ј	205	=	221	■	237	◊	253	²
142	Ä	158	₱	174	«	190	Ј	206	₩	222	■	238	ε	254	■
143	À	159	ƒ	175	»	191	₩	207	₩	223	■	239	○	255	

Source: www.LookupTables.com

Using Ascii

```
#include <iostream>

std::string userInput;
std::cout << (char) 227;

// Prints “π”
```

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Unicode

Encodes for all characters!

Emoji, 中文, 日本語, עברית, عربی, etc...



Use long char for these, as they're more than 1 byte

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Using Unicode

The Linux or Mac Terminals use it by default, so just type the characters and print them.

However, the Windows Console doesn't default to UTF-8.

Solution:

```
#include <windows.h>  
#pragma execution_character_set("utf-8")  
  
int main() {  
    SetConsoleOutputCP(65001);  
    std::cout << "こんにちは、コンスルさん";  
}
```

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ANSI Escape Codes

Did you spell ASCII wrong?

ANSI control how the console renders text.

Essentially strings read by the console as instructions instead of text.

Helpful Resource:

<https://gist.github.com/fnky/458719343aab01cfb17a3a4f7296797>

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ANSI Implementation

ASCII Characters

7. “\a” : terminal bell (BEL)
8. “\b” : backspace (BS)
9. “\t” : horizontal tab (TAB)
10. “\n” : new line (LF)
11. “\v” : vertical tab (VT)
13. “\r” : carriage return (CR)
27. “\033[“, “\x1B[“, or “\e[“ : Escape (ESC)

Typing Special Characters

- “\” : octal
- (char) : decimal
- “\x” : hexadecimal
- “\u” : unicode
- “\\” : \

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Escape Codes

Erasing Stuff

ESC[K : Erase Line After Cursor

ESC[1K : Erase Line Before Cursor

ESC[2K : Erase Line

ESC[J : Erase Screen After Cursor

ESC[1J : Erase Screen Before Cursor

ESC[2J : Erase Screen

ESC[3J : Erase Saved Lines

Style

ESC[0m : Clear Style

ESC[1m : Bold

ESC[2m : Faint/Dim

ESC[3m : Italic

ESC[4m : UnderLine

ESC[5m : Blinking

ESC[9m : Strikethrough

Escape Codes Continued

Byte Color

Chart on Right

ESC[{color code}m

RGB Color

ESC[38;2;{r};{g};{b}m : FG Color

ESC[48;2;{r};{g};{b}m : BG Color

Color Name	Foreground Color Code	Background Color Code
Black	30	40
Red	31	41
Green	32	42
Yellow	33	43
Blue	34	44
Magenta	35	45
Cyan	36	46
White	37	47
Default	39	49

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Examples

“\x1B[1;4;41mHELLO!” → **HELLO!**

“\033[3;9;33mmy soul” → ~~my sout~~

“\x1B[38;2;100;150;255m:P” → :P

“\x1B[1;35;47m\xF1\344H” → ±ΣΗ

I think you get the vision by this point...

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Assignment

ASCII Art

Print ASCII art in console that changes color and clears.

1. Have the art change color in the console
2. Have the art print in the console
3. Clear the art from the terminal at least once

(This assignment should be a joke. As in, make it funny. Don't just make rainbow text. please...)

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