



University of Central Punjab

Faculty of Information Technology

Computer Organization and Assembly Language (COAL)

Final Term Exam Lab FALL 2021

Name:

Registration Number:

Total Marks: 40

Time Allowed: 120 Minutes

Instructions:

1. Read Problem Statement carefully.
2. This is closed book and closed notes paper.
3. Only computer calculator is allowed.
4. Attempt all questions.
5. Submit only .asm files on UCP student portal of all questions.

Good Luck

Question # 1:

20 marks

Write a function “**writestring**” that takes two parameters. The first parameter is the string starting index to write the string and the second is the address of a memory area containing current row, current column and normal attribute.

The function writes the passed string at (**current row, current column**) using the **string instructions** and normal attribute. It then increments current column, If current column goes outside the window, it makes it **zero** and increments current row. If current row gets out of window, it scrolls the window one line up and write the string.

Example 1:

String db “I LOVE COAL”,0

Current_row: db 2

Current_col: db 5

Attribute: db 0x0F



I LOVE COAL

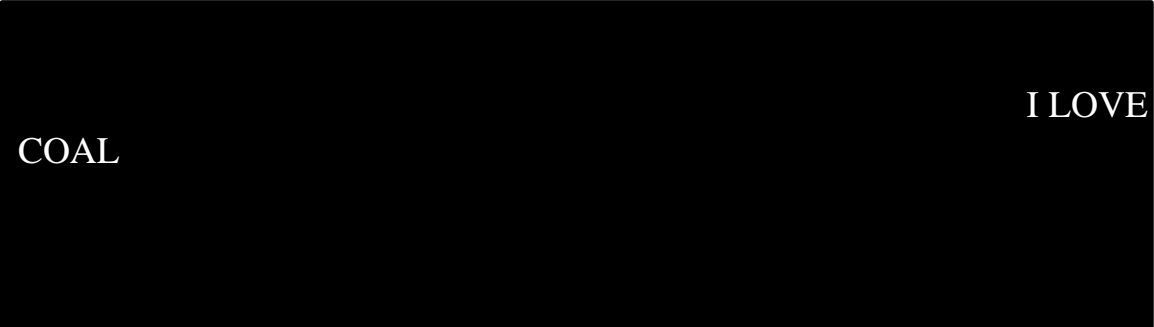
Example 2:

String db “I LOVE COAL”,0

Current_row: db 7

Current_col: db 68

Attribute: db 0x0F



COAL I LOVE

Note: Must use String Instructions and your code must be generic.

Question # 2:

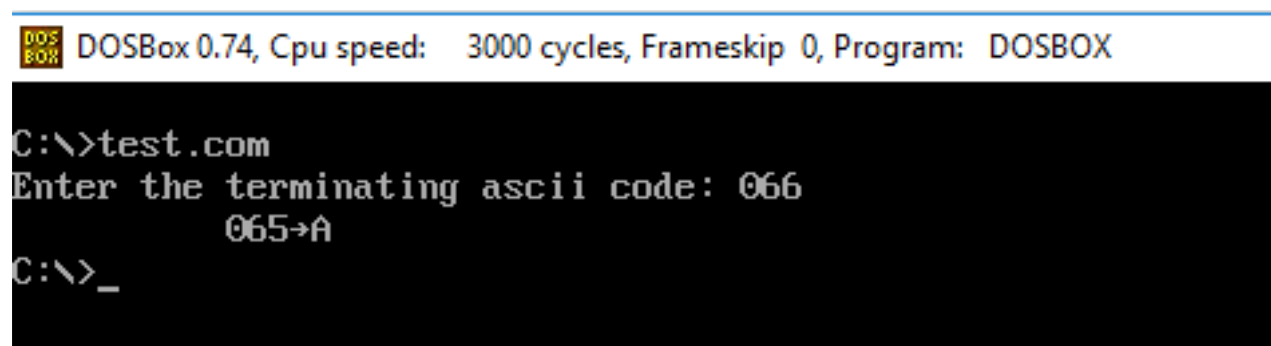
20 marks

Write a program which will **display** the character along with their respective ascii codes. **Hook** interrupt number **16h** against your `print_ascii` subroutine. Display the ascii table starting from **65** till a number **n** entered by a user.

Note: Don't Display anything if number **n** is less than **65** and greater than **255**

Hint: Complete the major functionality and then implement the hooking, unhooking in your code.

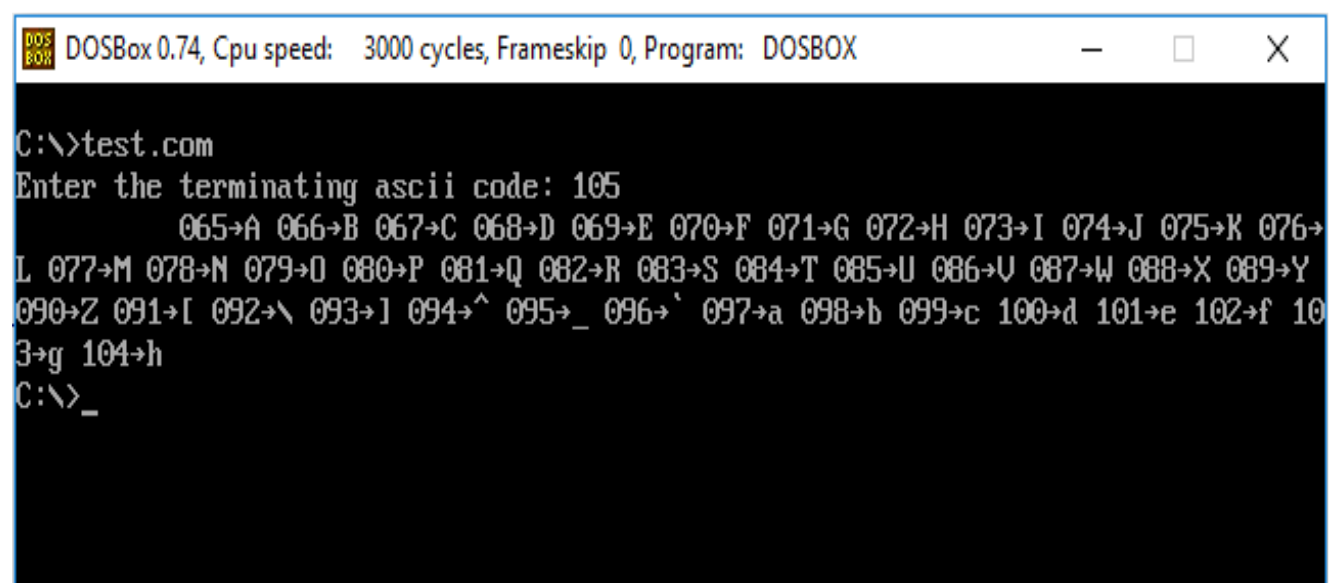
Example 1:



```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX

C:\>test.com
Enter the terminating ascii code: 066
      065→A
C:\>_
```

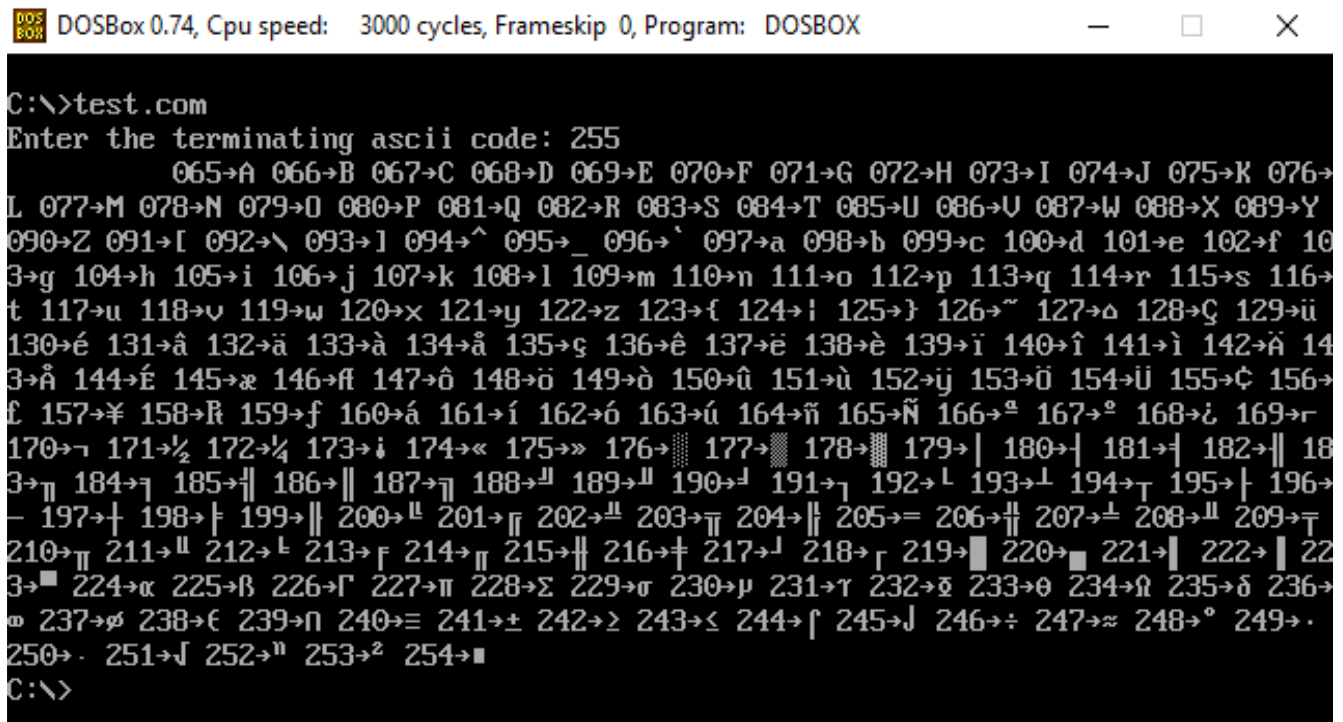
Example 2:



```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX

C:\>test.com
Enter the terminating ascii code: 105
      065→A 066→B 067→C 068→D 069→E 070→F 071→G 072→H 073→I 074→J 075→K 076→
L 077→M 078→N 079→O 080→P 081→Q 082→R 083→S 084→T 085→U 086→V 087→W 088→X 089→Y
090→Z 091→[ 092→\ 093→] 094→^ 095→_ 096→` 097→a 098→b 099→c 100→d 101→e 102→f 10
3→g 104→h
C:\>_
```

Example 3:



```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX
C:\>test.com
Enter the terminating ascii code: 255
065→A 066→B 067→C 068→D 069→E 070→F 071→G 072→H 073→I 074→J 075→K 076→
L 077→M 078→N 079→O 080→P 081→Q 082→R 083→S 084→T 085→U 086→V 087→W 088→X 089→Y
090→Z 091→[ 092→\ 093→] 094→^ 095→_ 096→` 097→a 098→b 099→c 100→d 101→e 102→f 10
3→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→~ 127→Δ 128→Ç 129→ü
130→é 131→â 132→ä 133→à 134→ã 135→ç 136→ê 137→ë 138→è 139→ï 140→î 141→ì 142→ñ 14
3→å 144→É 145→æ 146→ff 147→ô 148→ö 149→ò 150→û 151→ù 152→ÿ 153→Ü 154→Û 155→Ç 156→
£ 157→¥ 158→R 159→f 160→á 161→í 162→ó 163→ú 164→ñ 165→ñ 166→ª 167→º 168→¿ 169→r
170→¬ 171→½ 172→¼ 173→ì 174→« 175→» 176→ 177→ 178→ 179→| 180→| 181→| 182→| 18
3→ 184→ 185→ 186→ 187→ 188→ 189→ 190→ 191→ 192→ 193→ 194→ 195→ 196→
197→ 198→ 199→ 200→ 201→ 202→ 203→ 204→ 205→= 206→ 207→ 208→ 209→
210→ 211→ 212→ 213→ 214→ 215→ 216→ 217→ 218→ 219→ 220→ 221→ 222→ 22
3→ 224→ 225→ 226→ 227→ 228→ 229→ 230→ 231→ 232→ 233→ 234→ 235→ 236→
237→ 238→ 239→ 240→ 241→ 242→ 243→ 244→ 245→ 246→ 247→ 248→ 249→
250→ 251→ 252→ 253→ 254→
C:\>
```

Note: Your code must be generic.

ASCII CODES

HEX format

00:	null	20:	spa	40:	@	60:	`	80:	Ç	A0:	Á	C0:	À	E0:	α
01:	␣	21:	!	41:	A	61:	a	81:	ü	A1:	Â	C1:	Á	E1:	β
02:	␣	22:	"	42:	B	62:	b	82:	é	A2:	Ã	C2:	Â	E2:	Γ
03:	♥	23:	#	43:	C	63:	c	83:	â	A3:	ä	C3:	Ã	E3:	Π
04:	♦	24:	\$	44:	D	64:	d	84:	ä	A4:	Å	C4:	Ä	E4:	Σ
05:	♣	25:	%	45:	E	65:	e	85:	å	A5:	Ä	C5:	Å	E5:	σ
06:	♠	26:	&	46:	F	66:	f	86:	ç	A6:	Å	C6:	Ä	E6:	μ
07:	beep	27:	'	47:	G	67:	g	87:	ê	A7:	æ	C7:	Å	E7:	τ
08:	back	28:	<	48:	H	68:	h	88:	ë	A8:	ç	C8:	Å	E8:	ø
09:	tab	29:	>	49:	I	69:	i	89:	è	A9:	ç	C9:	Å	E9:	θ
0A:	newl	2A:	*	4A:	J	6A:	j	8A:	é	AA:	ç	CA:	Å	EA:	Ω
0B:	ø	2B:	+	4B:	K	6B:	k	8B:	ê	AB:	ç	CB:	Å	EB:	δ
0C:	♀	2C:	,	4C:	L	6C:	l	8C:	ë	AC:	ç	CC:	Å	EC:	ω
0D:	cret	2D:	-	4D:	M	6D:	m	8D:	ì	AD:	ç	CD:	Å	ED:	ø
0E:	␣	2E:	.	4E:	N	6E:	n	8E:	î	AE:	ç	CE:	Å	EE:	€
0F:	␣	2F:	/	4F:	O	6F:	o	8F:	ï	AF:	ç	CF:	Å	EF:	ñ
10:	▶	30:	0	50:	P	70:	p	90:	É	B0:	ç	D0:	Å	F0:	≡
11:	◀	31:	1	51:	Q	71:	q	91:	æ	B1:	ç	D1:	Å	F1:	±
12:	␣	32:	2	52:	R	72:	r	92:	Æ	B2:	ç	D2:	Å	F2:	≤
13:	!!	33:	3	53:	S	73:	s	93:	ô	B3:	ç	D3:	Å	F3:	∫
14:	¶	34:	4	54:	T	74:	t	94:	ö	B4:	ç	D4:	Å	F4:	÷
15:	§	35:	5	55:	U	75:	u	95:	û	B5:	ç	D5:	Å	F5:	∞
16:	≡	36:	6	56:	V	76:	v	96:	ü	B6:	ç	D6:	Å	F6:	°
17:	±	37:	7	57:	W	77:	w	97:	ÿ	B7:	ç	D7:	Å	F7:	·
18:	↑	38:	8	58:	X	78:	x	98:	ÿ	B8:	ç	D8:	Å	F8:	√
19:	↓	39:	9	59:	Y	79:	y	99:	ü	B9:	ç	D9:	Å	F9:	²
1A:	→	3A:	:	5A:	Z	7A:	z	9A:	Ü	BA:	ç	DA:	Å	FA:	³
1B:	←	3B:	;	5B:	[	7B:	<	9B:	ü	BB:	ç	DB:	Å	FB:	⁴
1C:	↳	3C:	<	5C:	\	7C:	!	9C:	Ë	BC:	ç	DC:	Å	FC:	⁵
1D:	↔	3D:	=	5D:	]	7D:	>	9D:	Ê	BD:	ç	DD:	Å	FD:	⁶
1E:	▲	3E:	>	5E:	^	7E:	~	9E:	ë	BE:	ç	DE:	Å	FE:	⁷
1F:	▼	3F:	?	5F:	_	7F:	Δ	9F:	ë	BF:	ç	DF:	Å	FF:	res

ASCII CODES

Decimal format

000:	null	032:	spa	064:	@	096:	`	128:	Ç	160:	Á	192:	À	224:	α
001:	␣	033:	!	065:	A	097:	a	129:	ü	161:	Â	193:	Á	225:	β
002:	␣	034:	"	066:	B	098:	b	130:	é	162:	Ã	194:	Â	226:	Γ
003:	♥	035:	#	067:	C	099:	c	131:	â	163:	ä	195:	Ã	227:	Π
004:	♦	036:	\$	068:	D	100:	d	132:	ä	164:	Å	196:	Ä	228:	Σ
005:	♣	037:	%	069:	E	101:	e	133:	å	165:	Ä	197:	Å	229:	σ
006:	♠	038:	&	070:	F	102:	f	134:	ç	166:	Å	198:	Ä	230:	μ
007:	beep	039:	'	071:	G	103:	g	135:	ç	167:	æ	199:	Å	231:	τ
008:	back	040:	<	072:	H	104:	h	136:	ê	168:	ç	200:	Å	232:	ø
009:	tab	041:	>	073:	I	105:	i	137:	ë	169:	ç	201:	Å	233:	θ
010:	newl	042:	*	074:	J	106:	j	138:	è	170:	ç	202:	Å	234:	Ω
011:	ø	043:	+	075:	K	107:	k	139:	é	171:	ç	203:	Å	235:	δ
012:	♀	044:	,	076:	L	108:	l	140:	ê	172:	ç	204:	Å	236:	ω
013:	cret	045:	-	077:	M	109:	m	141:	ë	173:	ç	205:	Å	237:	ø
014:	␣	046:	.	078:	N	110:	n	142:	ì	174:	ç	206:	Å	238:	€
015:	␣	047:	/	079:	O	111:	o	143:	î	175:	ç	207:	Å	239:	ñ
016:	▶	048:	0	080:	P	112:	p	144:	ï	176:	ç	208:	Å	240:	≡
017:	◀	049:	1	081:	Q	113:	q	145:	ä	177:	ç	209:	Å	241:	±
018:	␣	050:	2	082:	R	114:	r	146:	æ	178:	ç	210:	Å	242:	≤
019:	!!	051:	3	083:	S	115:	s	147:	Æ	179:	ç	211:	Å	243:	∫
020:	¶	052:	4	084:	T	116:	t	148:	ô	180:	ç	212:	Å	244:	÷
021:	§	053:	5	085:	U	117:	u	149:	ö	181:	ç	213:	Å	245:	∞
022:	≡	054:	6	086:	V	118:	v	150:	û	182:	ç	214:	Å	246:	°
023:	±	055:	7	087:	W	119:	w	151:	ü	183:	ç	215:	Å	247:	·
024:	↑	056:	8	088:	X	120:	x	152:	ÿ	184:	ç	216:	Å	248:	√
025:	↓	057:	9	089:	Y	121:	y	153:	ÿ	185:	ç	217:	Å	249:	²
026:	→	058:	:	090:	Z	122:	z	154:	Ü	186:	ç	218:	Å	250:	³
027:	←	059:	;	091:	[	123:	<	155:	ü	187:	ç	219:	Å	251:	⁴
028:	↳	060:	<	092:	\	124:	!	156:	Ë	188:	ç	220:	Å	252:	⁵
029:	↔	061:	=	093:	]	125:	>	157:	Ê	189:	ç	221:	Å	253:	⁶
030:	▲	062:	>	094:	^	126:	~	158:	ë	190:	ç	222:	Å	254:	⁷
031:	▼	063:	?	095:	_	127:	Δ	159:	ë	191:	ç	223:	Å	255:	res