



University of Central Punjab

Faculty of Information Technology

Computer Organization and Assembly Language (COAL)

Final Term Exam Lab Summer 2019

Name:

Registration Number

Total Marks: 70

Time Allowed: 3 hours

Instructions:

1. This is closed book and closed notes paper.
2. Only computer calculator is allowed.
3. Attempt all questions.
4. Submit all three .asm files on LMS.

Good Luck

Question# 1:

20 marks

Write a program which counts the **total number** of **1's** and **0's** within each element of an array. Assume array of byte size with 10 elements.

Use the following variables:

Sample_array: db 0x1B, 0XAA, 0X075, 0X63, 0X23, 0X00, 0X00, 0X01, 0X40, 0X9E

Total_ones: db 0

Total_zeros: db 0

Example 1:

Sample_array: db 0x1B, 0XAA, 0X075, 0X63, 0X23, 0X00, 0X00, 0X01, 0X40, 0X9E

Total_ones: db 27

Total_zeros: db 53

Question # 2:

20 marks

Write a program to merge two strings into a single string according to following criteria.

Final string is created by taking one element from each array one by one. Traverse first array in reverse order and second array in increasing order. Assume max size of first two arrays are 10 bytes each and final array is 20 bytes.

C	O	M	P	U	T	E	R												
S	C	I	E	N	C	E													
R	S	E	C	T	I	U	E	P	N	M	C	O	E	C					

Use the following variables:

first: db 'Computer',0

second: db 'Science',0

Final: times 20 db 0

Question #3:

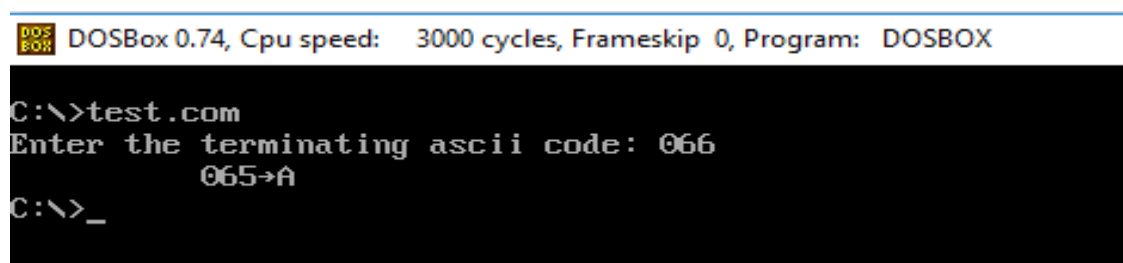
30 marks

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.

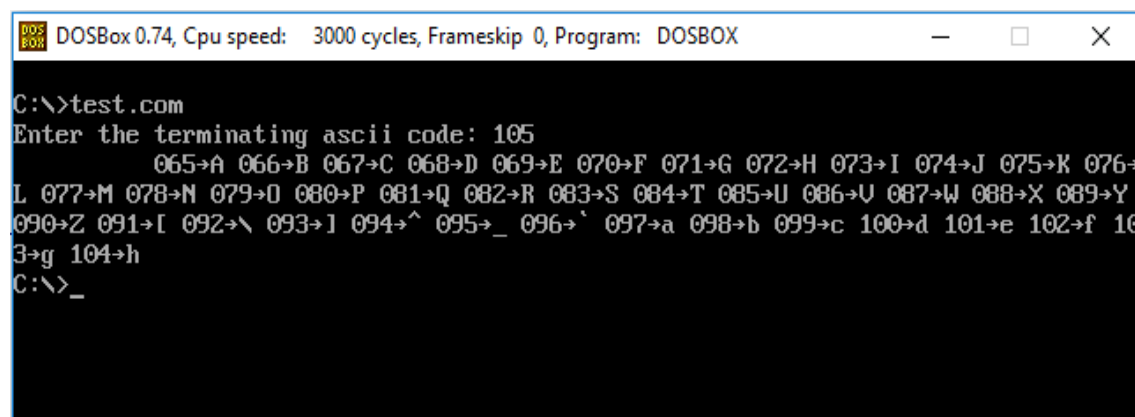
Hint: complete the major functionality and then implement the hooking, unhooking in your code.

Example 1:



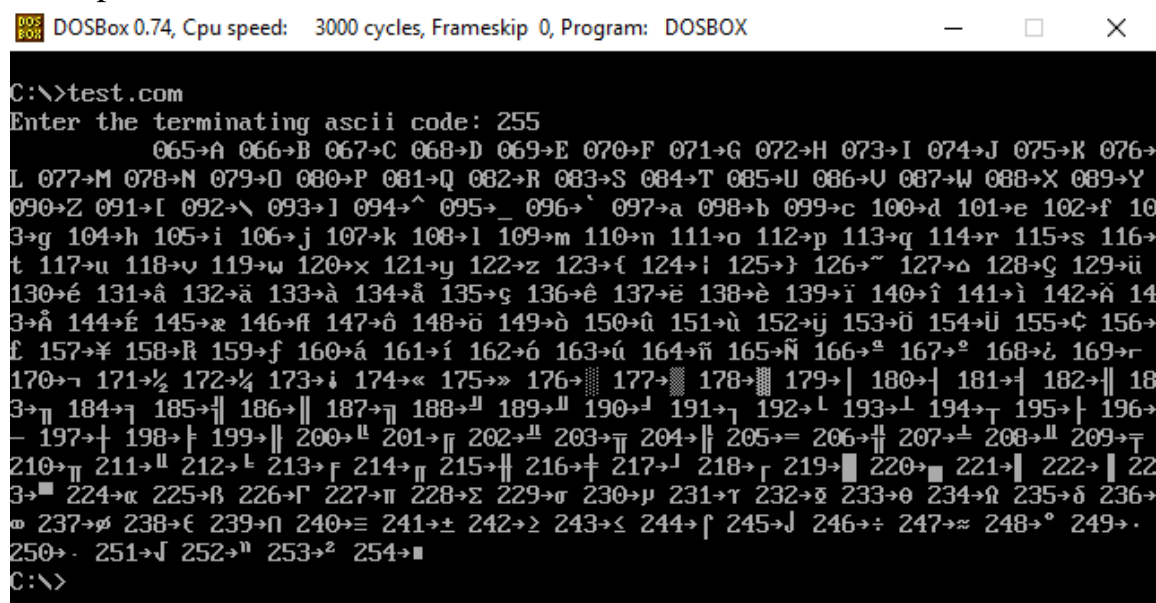
```
DOSBox 0.74, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX
C:\>test.com
Enter the terminating ascii code: 066
065→A
C:\>_
```

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→ 128→ 129→
130→é 131→â 132→ä 133→à 134→å 135→ç 136→ê 137→ë 138→è 139→ì 140→î 141→ï 142→ñ 14
3→ñ 144→é 145→æ 146→æ 147→ô 148→ö 149→ð 150→û 151→ù 152→ÿ 153→ÿ 154→ÿ 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→¿ 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→
223→ 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:\>
```