



Assignment 2 (Word Processor) Report

In this report I will discuss my first and final design also the algorithms of each part of the Word Processor.

DESIGN OF GRAPHICAL USER INTERFACE

Homepage:

First design of homepage: Main Frame



I used Direct Memory Access for drawing something on to the VGA Screen.

The standard IBM VGA card has 16 color therefor every pixel needs 4 bits ($2^4 = 16$) The VGA graphical card uses bitplanes, every main color has his own memory area in the video memory. Because the memory address is equal for every main color (A000:0000h memory mapped) we have to program the sequencer to select the right memory bank.

Writing to the Video Memory Code Example:

register selection with port 03C4h.

MOV AX,__02h <— AH stands for BIOS Color Number. AL stands for Map Mask Select.

DI stands for Pointer of Pixels. If I will write with STOSB,1 row pixel (640) = 80 (640/1 Byte Bit = 8).

```
MOV DI,0  
MOV DX,03C4h ;PORT SELECT  
MOV AX,0402h ;RED COLOR AND MAP MASK SELECT  
OUT DX,AX ; write all the bitplanes.  
MOV CX,6 ; Counter for Header  
MOV AX,0FFh ; write to every pixel.  
REP STOSW ; fill the screen
```

AL register	name
00	reset
01	Clocking mode
02	Map Mask
03	Character Map Select
04	Memory mode

With Second MOV AX,0FFh instruction we can write 1 to all 16 bit of Red Color Mask.

BIOS Color CODES:

Dec	Hex	Binary	Color	
0	0	0	Black	
1	1	1	Blue	
2	2	10	Green	
3	3	11	Cyan	
4	4	100	Red	
5	5	101	Magenta	
6	6	110	Brown	

7	7	111	Light Gray	
8	8	1000	Dark Gray	
9	9	1001	Light Blue	
10	A	1010	Light Green	
11	B	1011	Light Cyan	
12	C	1100	Light Red	
13	D	1101	Light Magenta	
14	E	1110	Yellow	
15	F	1111	White	

Explaining Mask Map Memory:

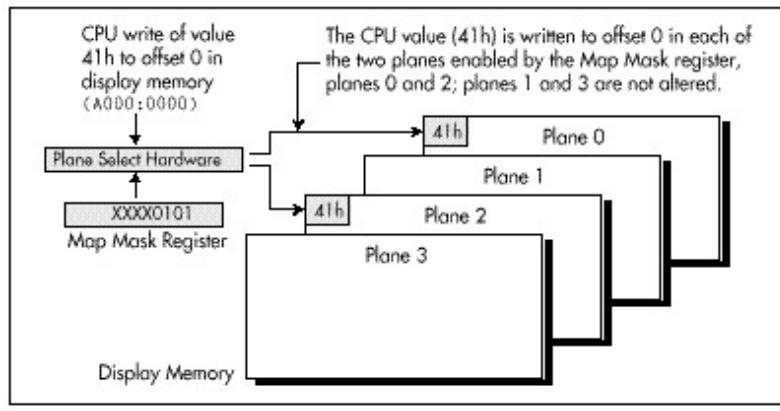
There is a good schematic to explain Mask Map Memory Writing Method.

Plane 0 corresponds to 0001 (Blue)

Plane 1 corresponds to 0010 (Green)

Plane 2 corresponds to 0100 (Red)

Plane 3 corresponds to 1000 (Intensity)



So, if I want to draw a red button area on gray background I have to look what is written on the selected pixel so, I know background is gray(0111).

I have 1 in memory which inside Plane 0, Plane 1 and Plane 2 but I need just 1 inside Plane 2 (0100)

This code piece will do it for me. It will write 0 inside Plane 0 and Plane 1.

```
MOV DI, 0
MOV DX, 03C4h
MOV AX, 0302h
OUT DX, AX
MOV CX, 6 ;
MOV AX, 00h ; write to every pixel 0.
REP STOSW
```

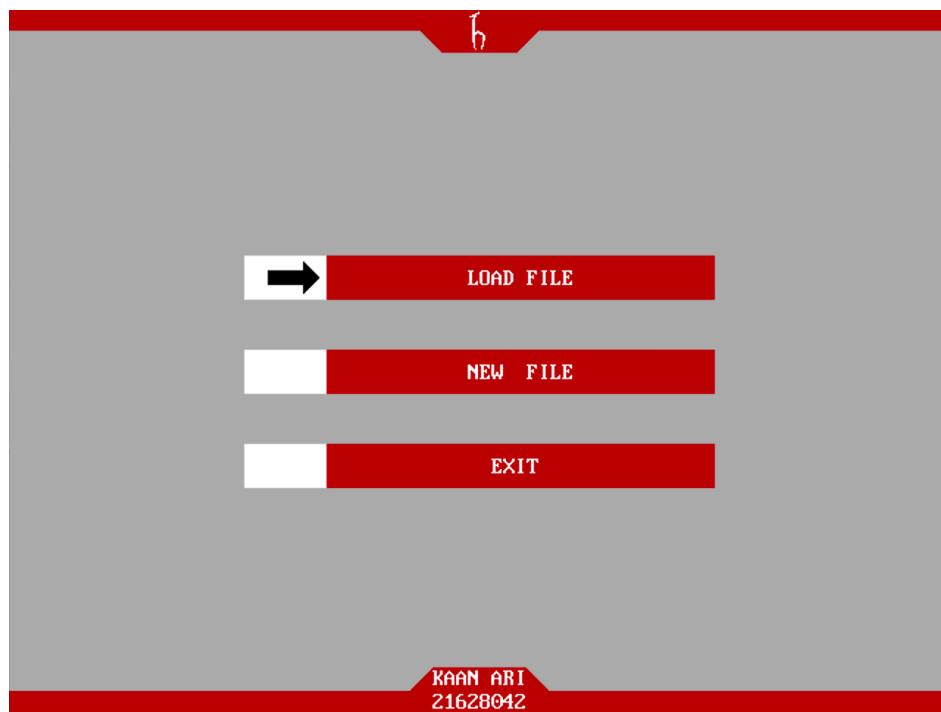
Writing Characters on Screen in VGA Graphic Mode (12h) - Teletype Mode:

I need to write foreground and background colored characters. I found Teletype (TTY) Mode.

First 4 bits of BL stands for Background Color. If BL = 0F7h then the character background will be transparent.

Last 4 bits of BL stand for Foreground Color but there is a little difference, last 4 bits of BL will XORed with Background Color. So If I have Gray Background (0111) and If BL = 0F7h then background will be gray and foreground will be Black since 0111 XOR 7h = 0111 => 0000.

Final design of homepage:



I mentioned how I can draw a color in VGA mode. Now I will explain how I can draw rectangles and curved rectangles.

It is very easy with the help of a good approach. I just used some shifting and rotating to get this shape.

Pseudo Code:

```
DI = 0  
CX = 16  
LOOP1:  
  
BX = 0000 0000 0000 0000b  
WRITE BIT PLANE 2 ( RED COLOR )  
SET CARRY FLAG  
RCL BX,1  
DI = DI+80 ; Go to next line  
DI = DI -1 ; Go to first column  
LOOP LOOP1
```



```
MOV BX,30  
LB22:  
  
MOV dx,03C4h  
MOV ax,0702h  
OUT dx,ax  
MOV cx,32  
MOV ax,00h  
REP STOSB  
; CLEARING GRAY COLOR ON THE SCREEN  
SUB DI,32  
  
MOV dx,03C4h  
MOV ax,0402h  
OUT dx,ax  
MOV cx,32  
MOV ax,0FFh  
REP STOSB  
;DRAWING RED COLOR TO THE CLEARED AREA ON THE SCREEN  
  
SUB DI,32 ;RETURN FIRST COLUMN  
ADD DI,80 ;NEXT LINE  
DEC BX  
JNZ LB2
```



Keyboard Control of Homepage:

```
MOV AH,00h  
INT 16h  
  
CMP AX,5000h  
JZ DOWN_ARROW  
  
CMP AX,4800h  
JZ UP_ARROW  
  
CMP AX,011Bh  
JZ EXIT  
  
CMP AX,1C0Dh  
JZ ENTER_BUT  
JMP PASSZ  
  
DOWN_ARROW:  
CALL CLEAR_ARROW  
CMP DI,23700  
JZ RETURN_UP  
ADD DI,5120  
JMP PASSZ  
  
RETURN_UP:  
SUB DI,10240  
JMP PASSZ  
  
UP_ARROW:  
CALL CLEAR_ARROW  
CMP DI,13460  
JZ RETURN_DOWN  
SUB DI,5120  
JMP PASSZ  
  
RETURN_DOWN:  
ADD DI,10240  
JMP PASSZ  
  
ENTER_BUT:  
CMP DI,23700  
JZ EXIT  
  
CMP DI,18580  
JZ NEWFILE_M  
  
CMP DI,13460  
JZ LOAD_M  
JMP NOTDRAW
```

I used current value of **DI** -which is used for drawing arrow- to determine which button is pressed by the user.

If user pressed up arrow while user is on the first button, pointer arrow will go to the last button. Same situation for the other case (If user pressed down arrow on last button).

Load File Page:



Some Backend Control for Load File Page:



If user enters nothing, this message will display.

CODE:

```
CMP CX,0 ; CX = Character number of input  
JZ NONAME_LOADFILE  
  
NONAME_LOADFILE: ; IF INPUT IS BLANK SHOW ERROR  
  
CALL CLEAR_FILENAME_INPUT  
  
MOV DH,14 ;row  
MOV DL,27 ;column  
CALL CURSOR_SET  
  
MOV BX,OFFSET BLANK_FILE_MSG  
MOV SI,BX ;EXIT BUTTON  
CALL INPUT_ERROR_PRINT  
  
JMP CONTINUE_LOADFILE
```



If user enters wrong Filename, this message will display.

CODE:

```
--CONTROL IF FILE IS EXIST--  
CALL OPEN_FILE  
  
JC FILE_NOT_EXIST2 ;File not exist Error  
JMP FILE_EXIST2 ;FILE EXIST  
;--LOADING FILE ERROR--  
FILE_NOT_EXIST2:  
CALL CLEAR_FILENAME_INPUT  
  
MOV DH,14 ;row  
MOV DL,30 ;column  
CALL CURSOR_SET  
  
MOV BX,OFFSET FILE_NEXIST_MSG  
MOV SI,BX ;EXIT BUTTON  
CALL INPUT_ERROR_PRINT  
  
JMP CONTINUE_LOADFILE  
  
;--LOADING FILE--  
  
FILE_EXIST2:  
MOV [SI], AX ; AX->File Handle  
  
JMP END2 ; ITS DONE
```

Useful Specs of Load File Page:

- 1) It can detect wrong filename and blank input.
- 2) User can go back to the homepage by pressing ESC

New File Page:



Useful Specs of New File Page:

- 1) It can detect wrong filename and blank input.
- 2) User can go back to the homepage by pressing ESC

Some Backend Control for New File Page:



If user enters nothing, this message will display.

CODE:

```
CMP CX,0 ; CX = Number of entered chars
JZ NONAME_NEWFILE

-----
-----
```

NONAME_NEWFILE: ; IF INPUT IS BLANK SHOW ERROR

```
CALL CLEAR_FILENAME_INPUT
MOV DH,14 ;row
MOV DL,27 ;column
CALL CURSOR_SET
MOV BX,OFFSET BLANK_FILE_MSG
MOV SI,BX ;EXIT BUTTON
CALL INPUT_ERROR_PRINT

JMP CONTINUE_NEWFILE
```



If user enters Filename which already exists, this message will display.

CODE:

```
;--CONTROL IF FILE IS EXIST--
CALL OPEN_FILE
JC FILE_NOT_EXIST
JMP FILE_EXIST ;FILE EXIST ERROR

;--CREATING FILE--
FILE_NOT_EXIST:
CALL CREATE_FILE
JC GO_BACK ;IF there is an ERRR
MOV [SI], AX
JMP END2 ; ITS DONE

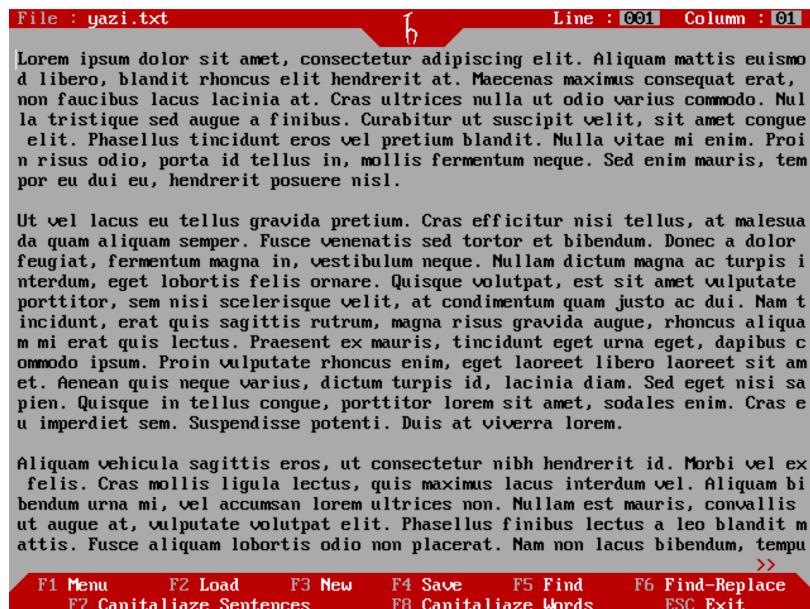
FILE_EXIST:;IF FILE IS EXIST ERROR MSG WILL SHOW UP
CALL CLEAR_FILENAME_INPUT

MOV DH,14 ;row
MOV DL,35 ;column
CALL CURSOR_SET

MOV BX,OFFSET FILE_EXIST_MSG
MOV SI,BX ;EXIT BUTTON
CALL INPUT_ERROR_PRINT

JMP CONTINUE_NEWFILE
```

EDITOR PAGE:



GENERAL SPECIFICATIONS:

1) Easy and Useful Cursor Movements

2) Pagination System:

This double right arrow shows that there is next page:



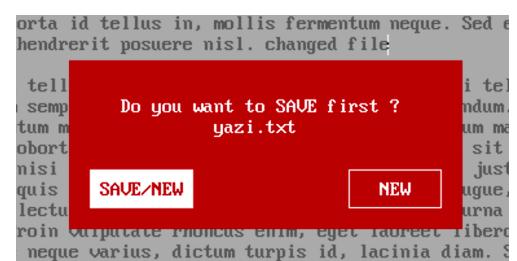
This double left arrow shows that there is previous page:



3) Smart :

If file is changed, whenever user wants to open new file, load file or exit editor, Editor will always ask user; Do you want to save?

If file is changed but saved or not changed, Editor never ask anything since user has nothing to lose.



4) High display capacity and Writing Options:

Editor Can Display 1950 character on one page. Unlimited Page. Nobody loves overwrite on a character when writing something so that editor can write between characters and has a perfect backspace button feedback.

Cursor Movements:

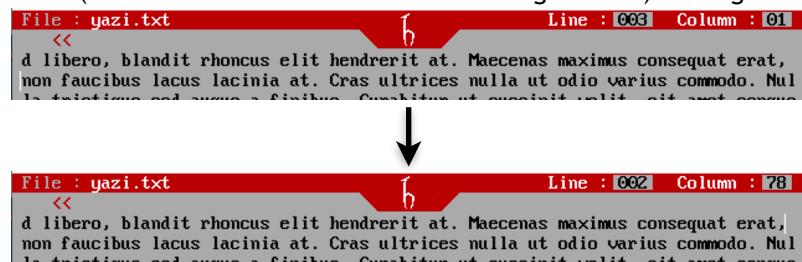
Users can browse the file comfortably and easily.

1) Pressing Left Arrow: It will move the cursor 1 character left on the same line.

Special Cases for Left Arrow:

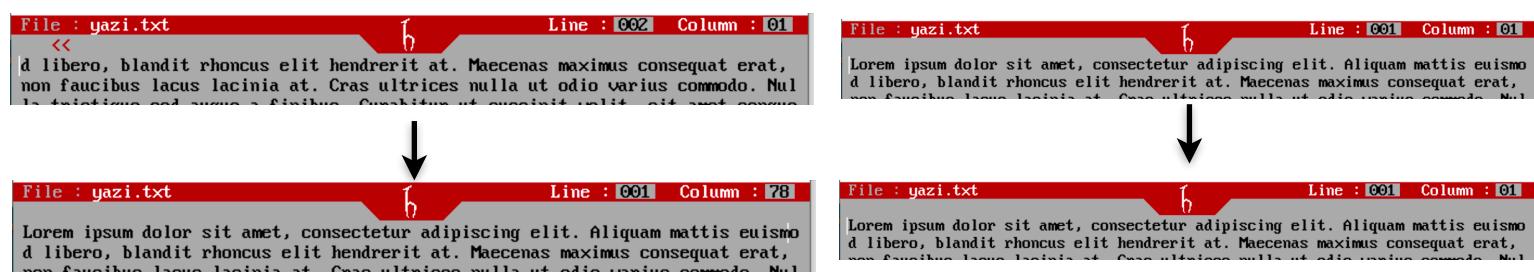
a) If Cursor is on the first column but not on the first line:

Cursor will go to previous line last character but there is some problem; cursor can go to destination point but file pointer (It stands for where the user is writing in file.) can't go directly.

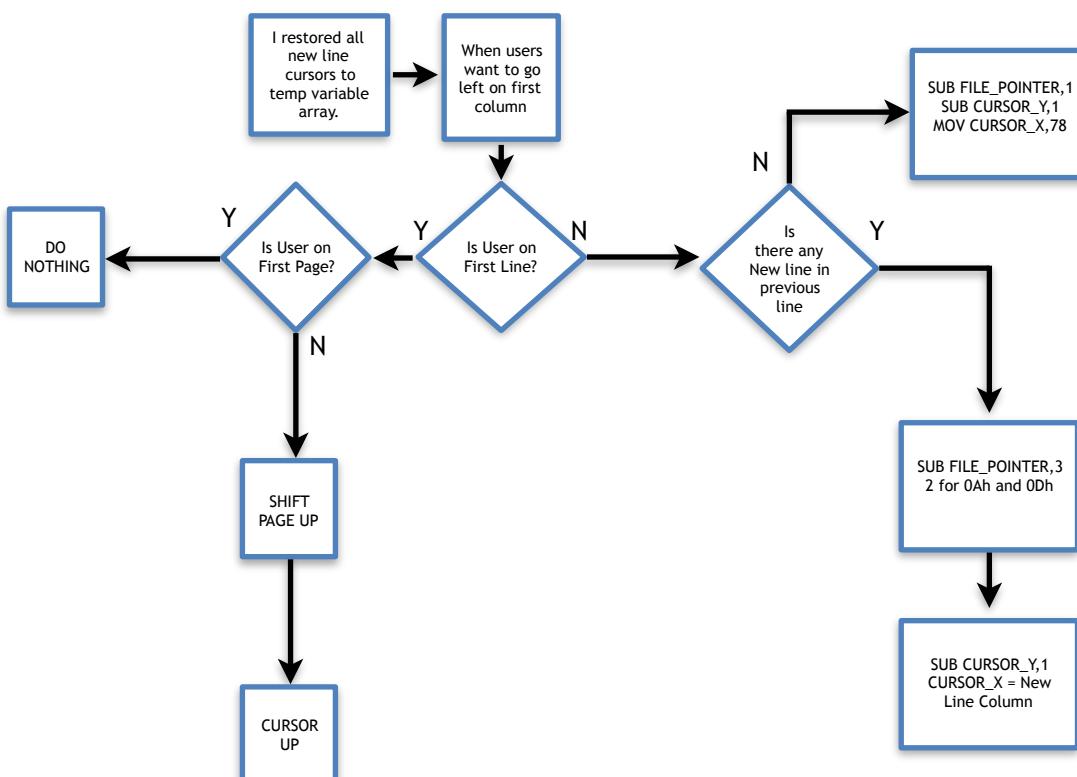


b) If Cursor is on the first column and first line:

Cursor can't go since there is no way to go. If user is not on the first page, Program have to display previous page.



I found an algorithm for these special and hard cases.



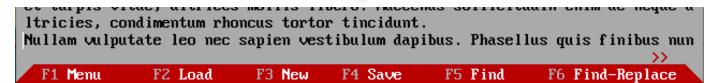
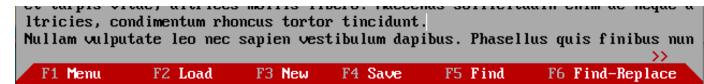
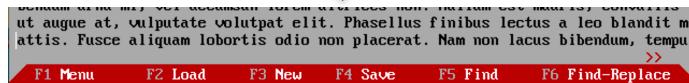
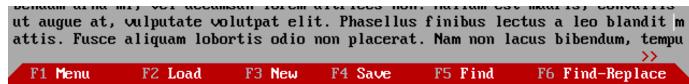
2) Pressing Right Arrow: It will move the cursor 1 character right on the same line.

*Last Column doesn't mean directly CURSOR_X = 78. It means last character before new lines or last columns so that problem is harder than previous case. I had to look same line with cursor not next line.

Special Cases for Right Arrow:

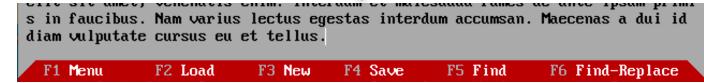
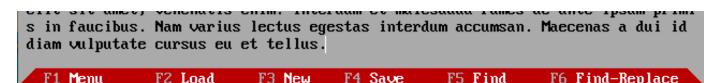
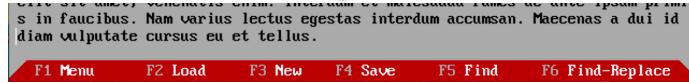
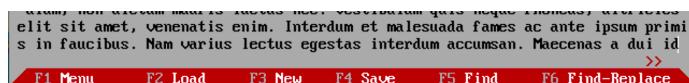
a) If Cursor is on the last column but not on the last line:

Cursor will go to next line first character but there is some problem: cursor can go to destination point but file pointer (It stands for where the user is writing in file.) can't go directly.

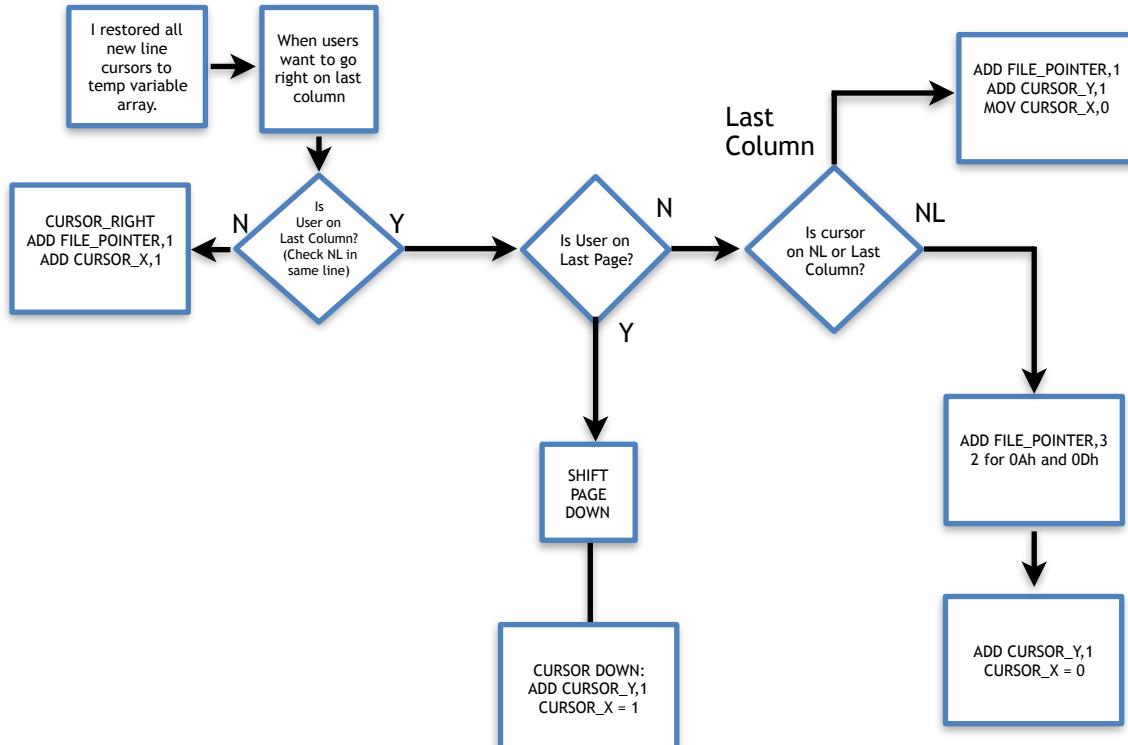


b) If Cursor is on the last column and last line:

Cursor can't go since there is no way to go. If user is not on the last page, Program have to display next page.



I found an algorithm for these special and hard cases.



3) Pressing Down Arrow: It will move the cursor 1 character down on the same column.

*Last line means not always exact last line. It means LAST LINE when EOF is not in current page.
It means EOF when EOF is on the same line.

All the cases of pressing down arrow are special cases.

These Cases:

A) If cursor is not on the last line:

a) If there is no new line on the same line and next line:

Cursor will go down directly and File Pointer increase 78 (There is 78 ASCII char in 1 line)

bendum urna mi, vel accumsan lorem ultrices non. Nullam est mauris, convallis
ut augue at, vulputate volutpat elit. Phasellus finibus lectus a leo blandit m
>>

F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit



bendum urna mi, vel accumsan lorem ultrices non. Nullam est mauris, convallis
ut augue at, vulputate volutpat elit. Phasellus finibus lectus a leo blandit m
>>

F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit

b) If there is new line on the same line and there is no new line on the next line:

et. Nunc quis neque varius, dictum turpis id, taciti diam. Sed eget nisi sa
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.
aaa
Aliquam vehicula sagittis eros, ut consectetur nibh hendrerit id. Morbi vel ex
felis. Cras mollis ligula lectus. quis maximus lacus interdum vel. Aliquam hi



et. Nunc quis neque varius, dictum turpis id, taciti diam. Sed eget nisi sa
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.
aaa
Aliquam vehicula sagittis eros, ut consectetur nibh hendrerit id. Morbi vel ex
felis. Cras mollis ligula lectus. quis maximus lacus interdum vel. Aliquam hi

c) If there is new line on the same line and there is new line on the next line:

c1) If new line on the next line column is less than current column

et. Phasellus tincidunt eros vel pretium diam. Nulla vitae mi enim. Id
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl. changed file

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor



et. Phasellus tincidunt eros vel pretium diam. Nulla vitae mi enim. Id
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl. changed file

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor

c2) If new line on the next line column is greater than current column

s et semper mi. Mauris sed volutpat nibh. Maecenas efficitur tellus quis lectu
s aliquam dignissim. Pellentesque facilisis.
Sed pulvinar, sapien in accumsan finibus, quam est eleifend magna.

At suscipit magna nisi et ligula. Vestibulum ante ipsum primis in faucibus orc



s et semper mi. Mauris sed volutpat nibh. Maecenas efficitur tellus quis lectu
s aliquam dignissim. Pellentesque facilisis.
Sed pulvinar, sapien in accumsan finibus, quam est eleifend magna.

At suscipit magna nisi et ligula. Vestibulum ante ipsum primis in faucibus orc

d) If there is no new line on the same line and there is new line on the next line:

d1) If new line on the next line column is less than current column

pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.
aaa
Aliquam vehicula sagittis eros, ut co
nsectetur nibh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, qu
ia maximus lacus interdum vel. Aliquam bibendum quis mi vel accumsan loben al



pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.
aaa
Aliquam vehicula sagittis eros, ut co
nsectetur nibh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, qu
ia maximus lacus interdum vel. Aliquam bibendum quis mi vel accumsan loben al

d2) If new line on the next line column is greater than current column

pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.
aaa
Aliquam vehicula sagittis eros, ut co
nsectetur nibh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, qu
ia maximus lacus interdum vel. Aliquam bibendum quis mi vel accumsan loben al



pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.
aaa
Aliquam vehicula sagittis eros, ut co
nsectetur nibh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, qu
ia maximus lacus interdum vel. Aliquam bibendum quis mi vel accumsan loben al

B) If cursor is on the last line(*):

a) If End Of File is on the last line: DO NOTHING

s in faucibus. Nam varius lectus egestas interdum accumsan. Maecenas a dui id
diam vulputate cursus eu et tellus.

F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit



s in faucibus. Nam varius lectus egestas interdum accumsan. Maecenas a dui id
diam vulputate cursus eu et tellus.

F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit

deneme last line check 1 2 1 2 mov ax bx lorem ipsum dolar sit amet deneme ch
deneme last line check 1 2 1 2
lorem ipsum loraamdsadaljdlajl last line check.

F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit



deneme last line check 1 2 1 2 mov ax bx lorem ipsum dolar sit amet deneme ch
deneme last line check 1 2 1 2
lorem ipsum loraamdsadaljdlajl last line check.

F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit

b) If End of File is not on the last line and there is next page: GO TO NEXT PAGE

diam, non dictum mauris luctus nec. Vestibulum quis neque rhoncus, ultricies
elit sit amet, venenatis enim. Interdum et malesuada fames ac ante ipsum primi
>>

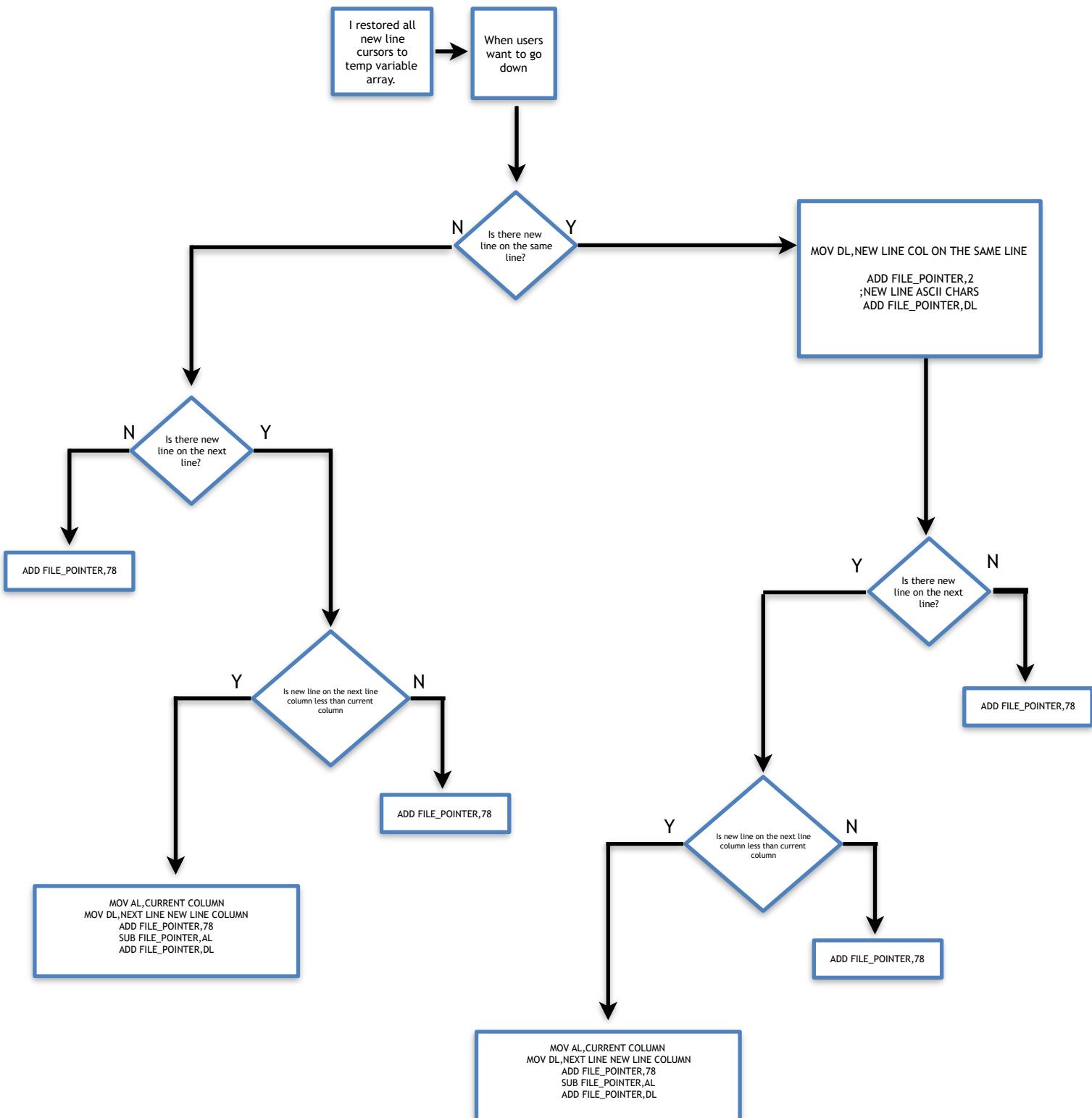
F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit



elit sit amet, venenatis enim. Interdum et malesuada fames ac ante ipsum primi
s in faucibus. Nam varius lectus egestas interdum accumsan. Maecenas a dui id
>>

F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace
F7 Capitaliaze Sentences F8 Capitaliaze Words ESC Exit

I found an algorithm for these special and hard cases.



4) Pressing Up Arrow: It will move the cursor 1 character up on the same column.

All the cases of pressing down up are special cases.

These Cases:

A) If cursor is not on the first line:

a) If there is no new line on the same line and previous line:

Cursor will go up directly and File Pointer decreases 78 (There is 78 ASCII char in 1 line)

```
bendum urna mi, vel accumsan lorem ultrices non. Nullam est mauris, convallis  
ut augue at, vulputate volutpat elit. Phasellus finibus lectus a leo blandit m  
>>  
F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace  
F7 Capitalize Sentences F8 Capitalize Words ESC Exit
```



```
bendum urna mi, vel accumsan lorem ultrices non. Nullam est mauris, convallis  
ut augue at, vulputate volutpat elit. Phasellus finibus lectus a leo blandit m  
>>  
F1 Menu F2 Load F3 New F4 Save F5 Find F6 Find-Replace  
F7 Capitalize Sentences F8 Capitalize Words ESC Exit
```

b) If there is new line on the same line and there is no new line on the previous line:

```
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e  
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.  
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa  
Aliquam vehicula sagittis eros, ut co  
nsectetur nibh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, qu  
o maximus lacus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.  
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
```



```
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e  
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.  
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa  
Aliquam vehicula sagittis eros, ut co  
nsectetur nibh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, qu  
o maximus lacus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.  
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
```

c) If there is new line on the same line and there is new line on the previous line:

c1) If new line on the previous line column is less than current column

```
Aliquam vehicula sagittis eros, ut consectetur ni  
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus l  
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.  
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
```



```
Aliquam vehicula sagittis eros, ut consectetur ni  
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus l  
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.  
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
```

c2) If new line on the previous line column is greater than current column

```
s et semper mi. Mauris sed volutpat nibh. Maecenas efficitur tellus quis lectu  
s aliquam dignissim. Pellentesque facilisis.  
Sed pulvinar, sapien in accumsan finibus, quam est eleifend magna.  
At suscipit magna nisi et ligula. Vestibulum ante ipsum primis in faucibus orc
```



```
s et semper mi. Mauris sed volutpat nibh. Maecenas efficitur tellus quis lectu  
s aliquam dignissim. Pellentesque facilisis.  
Sed pulvinar, sapien in accumsan finibus, quam est eleifend magna.  
At suscipit magna nisi et ligula. Vestibulum ante ipsum primis in faucibus orc
```

d) If there is no new line on the same line and there is new line on the previous line:

d1) If new line on the previous line column is less than current column

```
Aliquam vehicula sagittis eros, ut consectetur ni  
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus l  
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.  
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
```



```
Aliquam vehicula sagittis eros, ut consectetur ni  
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus l  
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.  
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
```

d2) If new line on the previous line column is greater than current column

```
et. neque varius, dictum turpis in, laciniat diam. Sed eget nisi sa  
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e  
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.  
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa  
Aliquam vehicula sagittis eros, ut consectetur nibh hendrerit id. Morbi vel ex  
felis. Cras mollis ligula lectus, quis maximus lacus interdum vel. Aliquam bi
```



```
et. neque varius, dictum turpis in, laciniat diam. Sed eget nisi sa  
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e  
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.  
aaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa  
Aliquam vehicula sagittis eros, ut consectetur nibh hendrerit id. Morbi vel ex  
felis. Cras mollis ligula lectus, quis maximus lacus interdum vel. Aliquam bi
```

B) If cursor is on the first line of current page:

a) If user is on the first page: DO NOTHING

```
File : gazi.txt Line : 001 Column : 39  
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam mattis euism  
d libero, blandit rhoncus elit hendrerit at. Maecenas maximus consequat erat,  
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Mu
```



```
File : gazi.txt Line : 001 Column : 39  
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam mattis euism  
d libero, blandit rhoncus elit hendrerit at. Maecenas maximus consequat erat,  
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Mu
```

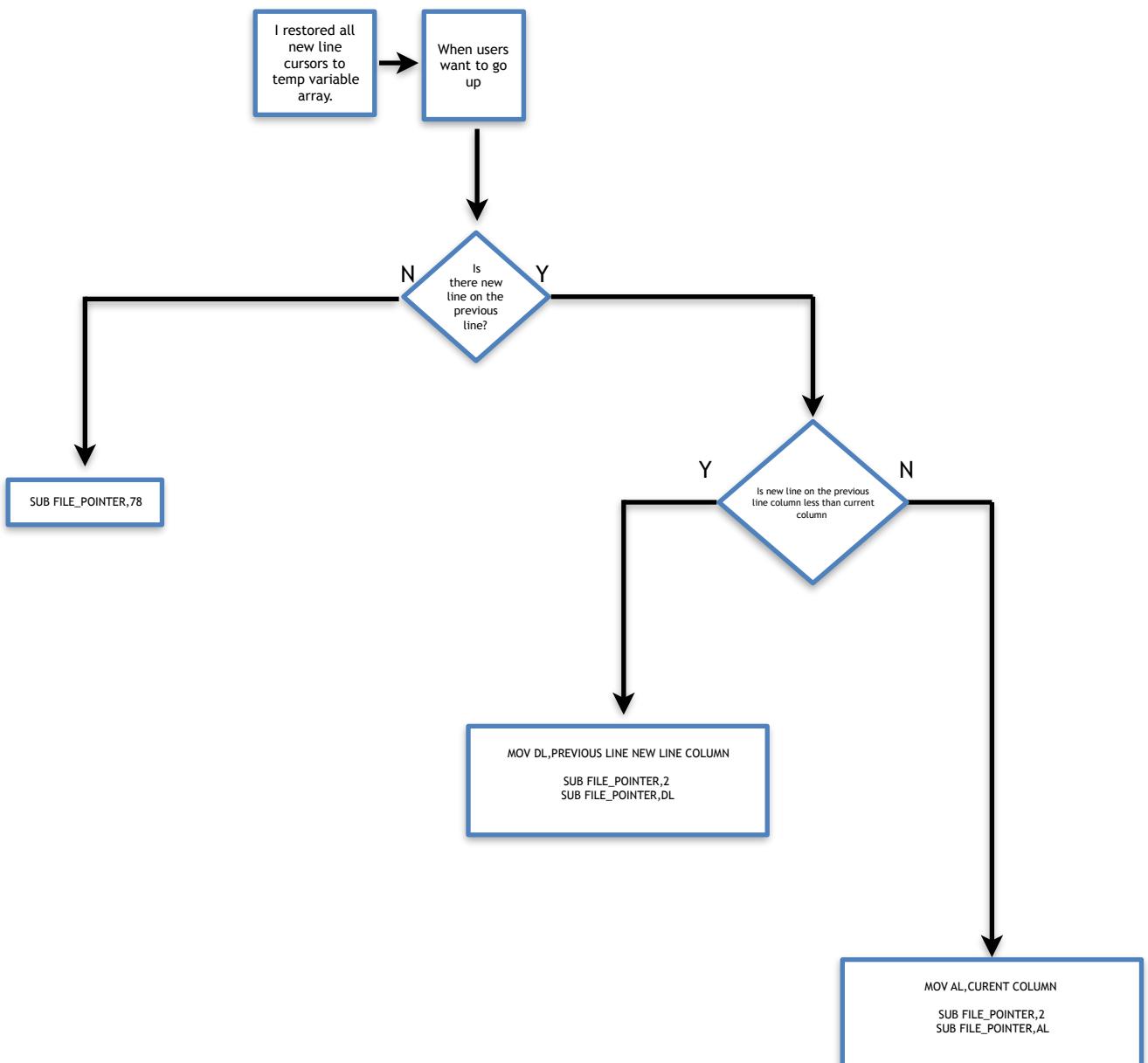
b) If user is not on the first page: GO TO PREVIOUS PAGE

```
File : gazi.txt Line : 004 Column : 34  
<<  
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue  
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi  
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
```



```
File : gazi.txt Line : 003 Column : 01  
<<  
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Mu  
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue  
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi
```

I found an algorithm for these special and hard cases.



Pagination:

1) Shifting Page Down

Shifting page down is done by finding character number of first line which on current page.

After that, when user wants to go to the next page just display from this number to the end of the screen. I stored all number -which needs to be used for shifting up also- in an array.

```
File : yazi.txt          Line : 003  Column : 01
<<                         h
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nul
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl.

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor
feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis i
nterdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate
porttitor, sem nisi scelerisque velit, at condimentum quam justo ac dui. Nam t
incidunt, erat quis sagittis rutrum, magna risus gravida augue, rhoncus aliqua
m mi erat quis lectus. Praesent ex mauris, tincidunt eget urna eget, dapibus c
ommodo ipsum. Proin vulputate rhoncus enim, eget laoreet libero laoreet sit am
et. Aenean quis neque varius, dictum turpis id, lacinia diam. Sed eget nisi sa
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdier sem. Suspendisse potenti. Duis at viverra lorem.

Aliquam vehicula sagittis eros, ut consectetur ni
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus 1
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
inibus lectus a leo blandit mattis. Fusce aliquam lobortis odio non placerat.
Nam non lacus bibendum, tempus mi eget, laoreet sapien. Fusce non sodales augu
e, eu vehicula magna. Maecenas et semper mi. Mauris sed volutpat nibh. Maecena
>>
F1 Menu      F2 Load      F3 New      F4 Save      F5 Find      F6 Find-Replace
F7 Capitaliaze Sentences   F8 Capitaliaze Words    ESC Exit
```



```
File : yazi.txt          Line : 028  Column : 28
<<                         h
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl.

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor
feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis i
nterdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate
porttitor, sem nisi scelerisque velit, at condimentum quam justo ac dui. Nam t
incidunt, erat quis sagittis rutrum, magna risus gravida augue, rhoncus aliqua
m mi erat quis lectus. Praesent ex mauris, tincidunt eget urna eget, dapibus c
ommodo ipsum. Proin vulputate rhoncus enim, eget laoreet libero laoreet sit am
et. Aenean quis neque varius, dictum turpis id, lacinia diam. Sed eget nisi sa
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdier sem. Suspendisse potenti. Duis at viverra lorem.

Aliquam vehicula sagittis eros, ut consectetur ni
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus 1
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
inibus lectus a leo blandit mattis. Fusce aliquam lobortis odio non placerat.
Nam non lacus bibendum, tempus mi eget, laoreet sapien. Fusce non sodales augu
e, eu vehicula magna. Maecenas et semper mi. Mauris sed volutpat nibh. Maecena
s efficitur tellus quis lectus aliquam dignissim. Pellentesque facilisis vel s
>>
F1 Menu      F2 Load      F3 New      F4 Save      F5 Find      F6 Find-Replace
F7 Capitaliaze Sentences   F8 Capitaliaze Words    ESC Exit
```

2) Shifting Page Up

Shifting page up is done by getting the current page number and storing the first line character number of previous page.

After that, when user wants to go to the previous page just display from this number to the end of the screen.

```
File : yazi.txt          Line : 004  Column : 23
<<                         h
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl.

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor
feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis i
nterdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate
porttitor, sem nisi scelerisque velit, at condimentum quam justo ac dui. Nam t
incidunt, erat quis sagittis rutrum, magna risus gravida augue, rhoncus aliqua
m mi erat quis lectus. Praesent ex mauris, tincidunt eget urna eget, dapibus c
ommodo ipsum. Proin vulputate rhoncus enim, eget laoreet libero laoreet sit am
et. Aenean quis neque varius, dictum turpis id, lacinia diam. Sed eget nisi sa
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.

Aliquam vehicula sagittis eros, ut consectetur ni
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus l
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
inibus lectus a leo blandit mattis. Fusce aliquam lobortis odio non placerat.
Nam non lacus bibendum, tempus mi eget, laoreet sapien. Fusce non sodales augu
e, eu vehicula magna. Maecenas et semper mi. Mauris sed volutpat nibh. Maecena
s efficitur tellus quis lectus aliquam dignissim. Pellentesque facilisis vel s
>>
F1 Menu      F2 Load      F3 New      F4 Save      F5 Find      F6 Find-Replace
F7 Capitalize Sentences  F8 Capitalize Words  ESC Exit
```



```
File : yazi.txt          Line : 003  Column : 01
<<                         h
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nul
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl.

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor
feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis i
nterdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate
porttitor, sem nisi scelerisque velit, at condimentum quam justo ac dui. Nam t
incidunt, erat quis sagittis rutrum, magna risus gravida augue, rhoncus aliqua
m mi erat quis lectus. Praesent ex mauris, tincidunt eget urna eget, dapibus c
ommodo ipsum. Proin vulputate rhoncus enim, eget laoreet libero laoreet sit am
et. Aenean quis neque varius, dictum turpis id, lacinia diam. Sed eget nisi sa
pien. Quisque in tellus congue, porttitor lorem sit amet, sodales enim. Cras e
u imperdiet sem. Suspendisse potenti. Duis at viverra lorem.

Aliquam vehicula sagittis eros, ut consectetur ni
bh hendrerit id. Morbi vel ex felis. Cras mollis ligula lectus, quis maximus l
acus interdum vel. Aliquam bibendum urna mi, vel accumsan lorem ultrices non.
Nullam est mauris, convallis ut augue at, vulputate volutpat elit. Phasellus f
inibus lectus a leo blandit mattis. Fusce aliquam lobortis odio non placerat.
Nam non lacus bibendum, tempus mi eget, laoreet sapien. Fusce non sodales augu
e, eu vehicula magna. Maecenas et semper mi. Mauris sed volutpat nibh. Maecena
s efficitur tellus quis lectus aliquam dignissim. Pellentesque facilisis vel s
>>
F1 Menu      F2 Load      F3 New      F4 Save      F5 Find      F6 Find-Replace
F7 Capitalize Sentences  F8 Capitalize Words  ESC Exit
```

Characters between the characters not overwriting:

1) Writing

When a user types something, characters will display between previous character and next character. To do this, I had to expand memory which holds the file from current file pointer.

```
File : yazi.txt          Line : 009 Column : 12
<<                         h
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nul
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl.

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor
feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis i
nterdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate

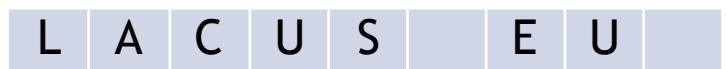
File : yazi.txt          Line : 009 Column : 13
<<                         h
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nul
la tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue
elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proi
n risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tem
por eu dui eu, hendrerit posuere nisl.

Ut vel lacuks eu tellus gravida pretium. Cras efficitur nisi tellus, at malesu
da quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor
feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis
interdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate
```

CODE:

```
EXTEND_MEM PROC
    MOV AX,@DATA
    MOV ES,AX
    MOV BX,offset FILE_POINTER
    MOV DX,[BX]
    MOV BX,offset FILE_LEN
    MOV CX,[BX]
    SUB CX,DX ; LOOP NUMBER
    INC CX
    MOV BX, offset FILE_RESTORE
    MOV SI,BX
    ADD SI,DX
    MOV BX, offset FILE_DUMMY
    MOV DI,BX
    REP MOVS
    MOV BX,offset FILE_POINTER
    MOV DX,[BX]
    MOV BX,offset FILE_LEN
    MOV CX,[BX]
    SUB CX,DX ; LOOP NUMBER
    INC CX
    MOV BX, offset FILE_DUMMY
    MOV SI,BX
    MOV BX, offset FILE_RESTORE
    MOV DI,BX
    ADD DI,DX
    INC DI
    REP MOVS
    MOV BX,offset FILE_LEN
    MOV CX,[BX]
    INC CX
    MOV [BX],CX
    MOV AX,0A000h
    MOV ES,AX
    RET
EXTEND_MEM ENDP
```

Memory:



Characters between the characters not overwriting:

2) Deleting

When a user press backspace previous character will delete screen and memory.
To do this, I had to reduce memory which holds the file from current file pointer.

```
File : yazi.txt          Line : 009  Column : 13
<<
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nulla tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proin risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tempor eu dui eu, hendrerit posuere nisl.

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesuada quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis interdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate
```

↓

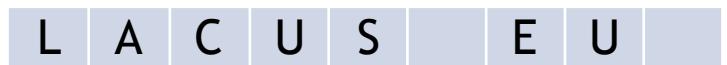
```
File : yazi.txt          Line : 009  Column : 12
<<
non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nulla tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proin risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tempor eu dui eu, hendrerit posuere nisl.

Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesuada quam aliquam semper. Fusce venenatis sed tortor et bibendum. Donec a dolor feugiat, fermentum magna in, vestibulum neque. Nullam dictum magna ac turpis interdum, eget lobortis felis ornare. Quisque volutpat, est sit amet vulputate
```

CODE:

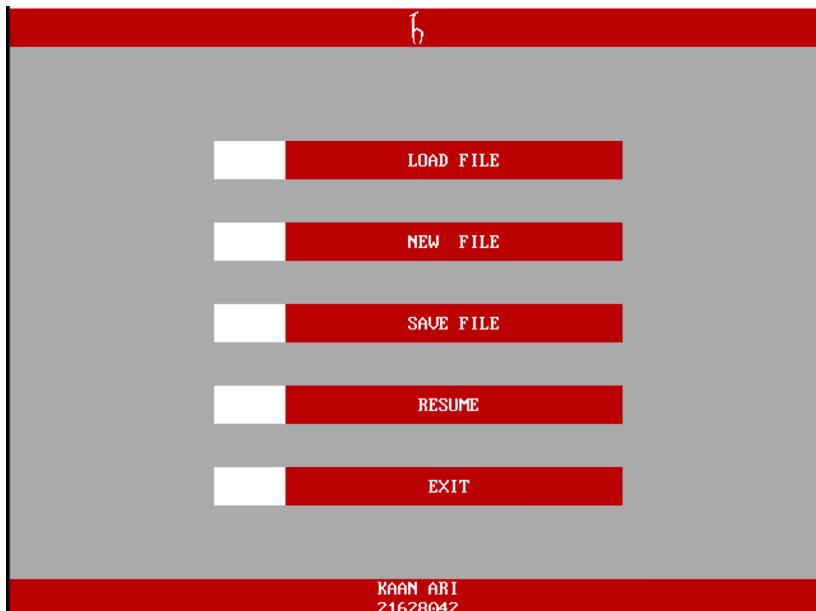
```
REDUCE_MEM PROC
    MOV AX,@DATA
    MOV ES,AX
    MOV BX,offset FILE_POINTER
    MOV DX,[BX]
    MOV BX,offset FILE_LEN
    MOV CX,[BX]
    SUB CX,DX ; LOOP NUMBER
    INC CX
    MOV BX, offset FILE_RESTORE
    MOV SI,BX
    ADD SI,DX
    MOV BX, offset FILE_DUMMY
    MOV DI,BX
    REP MOVS
    MOV BX,offset FILE_POINTER
    MOV DX,[BX]
    MOV BX,offset FILE_LEN
    MOV CX,[BX]
    SUB CX,DX ; LOOP NUMBER
    INC CX
    MOV BX, offset FILE_DUMMY
    MOV SI,BX
    MOV BX, offset FILE_RESTORE
    MOV DI,BX
    ADD DI,DX
    DEC DI
    REP MOVS
    MOV BX,offset FILE_LEN
    MOV CX,[BX]
    DEC CX
    MOV [BX],CX
    MOV AX,0A000h
    MOV ES,AX
    RET
REDUCE_MEM ENDP
```

Memory:



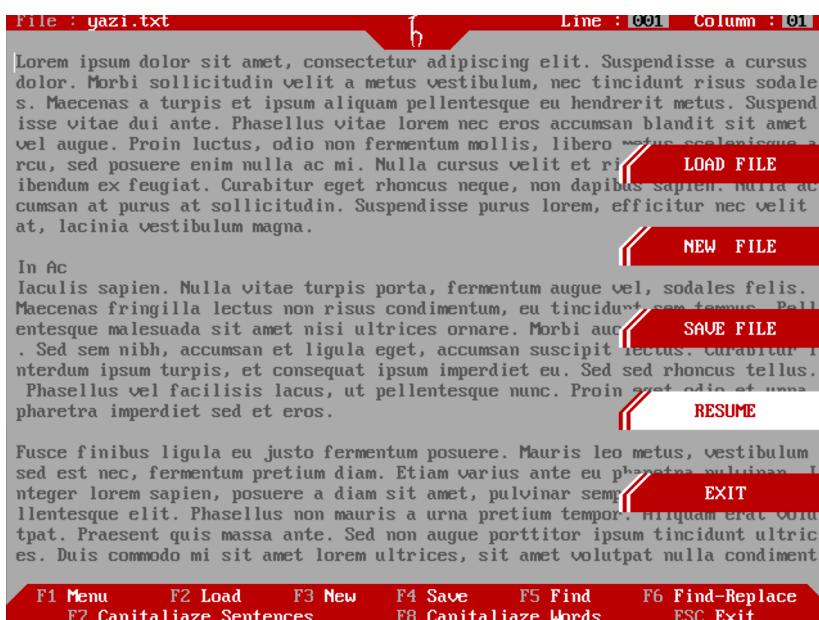
MENU:

First Design of Menu:



Firstly, I designed a menu with similar design with Homepage but I didn't like it. Later I found it useless .

Final Design of Menu:



I found this design after some ideas. Users don't have to see page changing to use Menu.

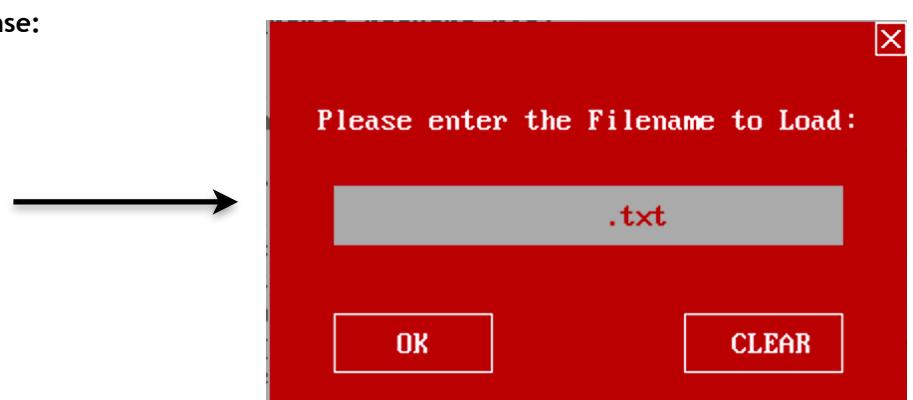
I used same methods and same codes for drawing menu. Except that I saw some easy tricks like disabled look of text, I selected Plane 4 (Intensity) and print all characters.

UX DESIGN OF MENU:

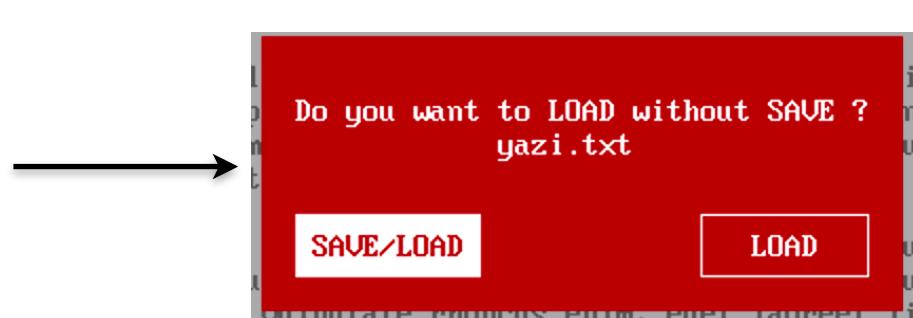
Menu button responds differently to changed file statement and unchanged file statement(or saved). User can go back to the Editor by pressing ESC or F1.

LOAD FILE BUTTON:

Unchanged or saved File Response:



Changed File Response:



NEW FILE BUTTON:

Unchanged or saved File Response:

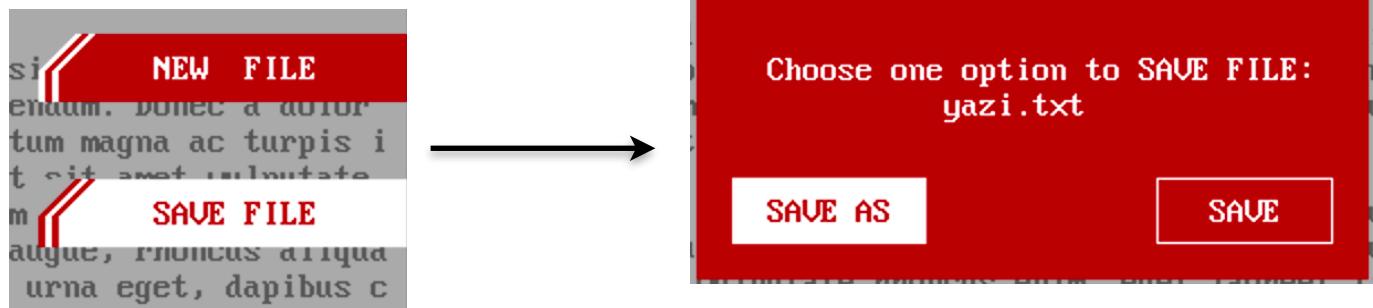


Changed File Response:



SAVE FILE BUTTON:

Single Response for all situations:



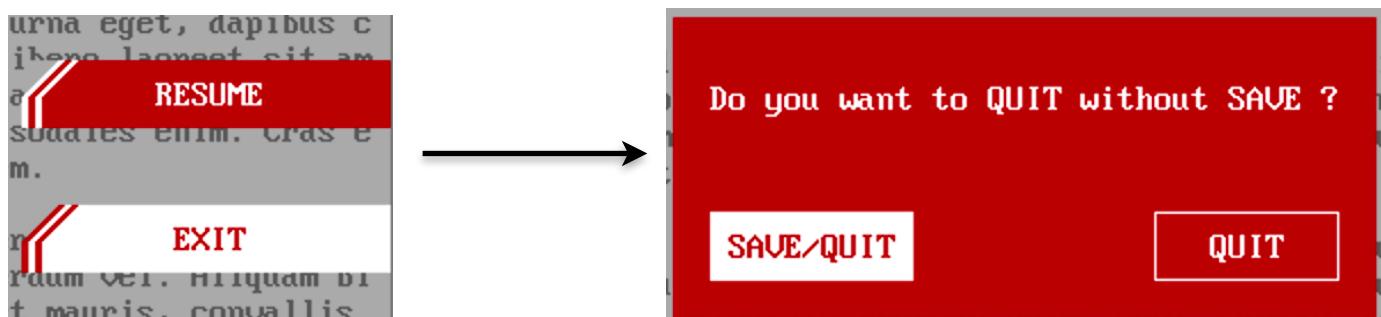
RESUME FILE BUTTON:

Single Response: Go back to the editor. User can press F1 or ESC to do same-thing.

EXIT FILE BUTTON:

Unchanged or saved File Response: Quit Program

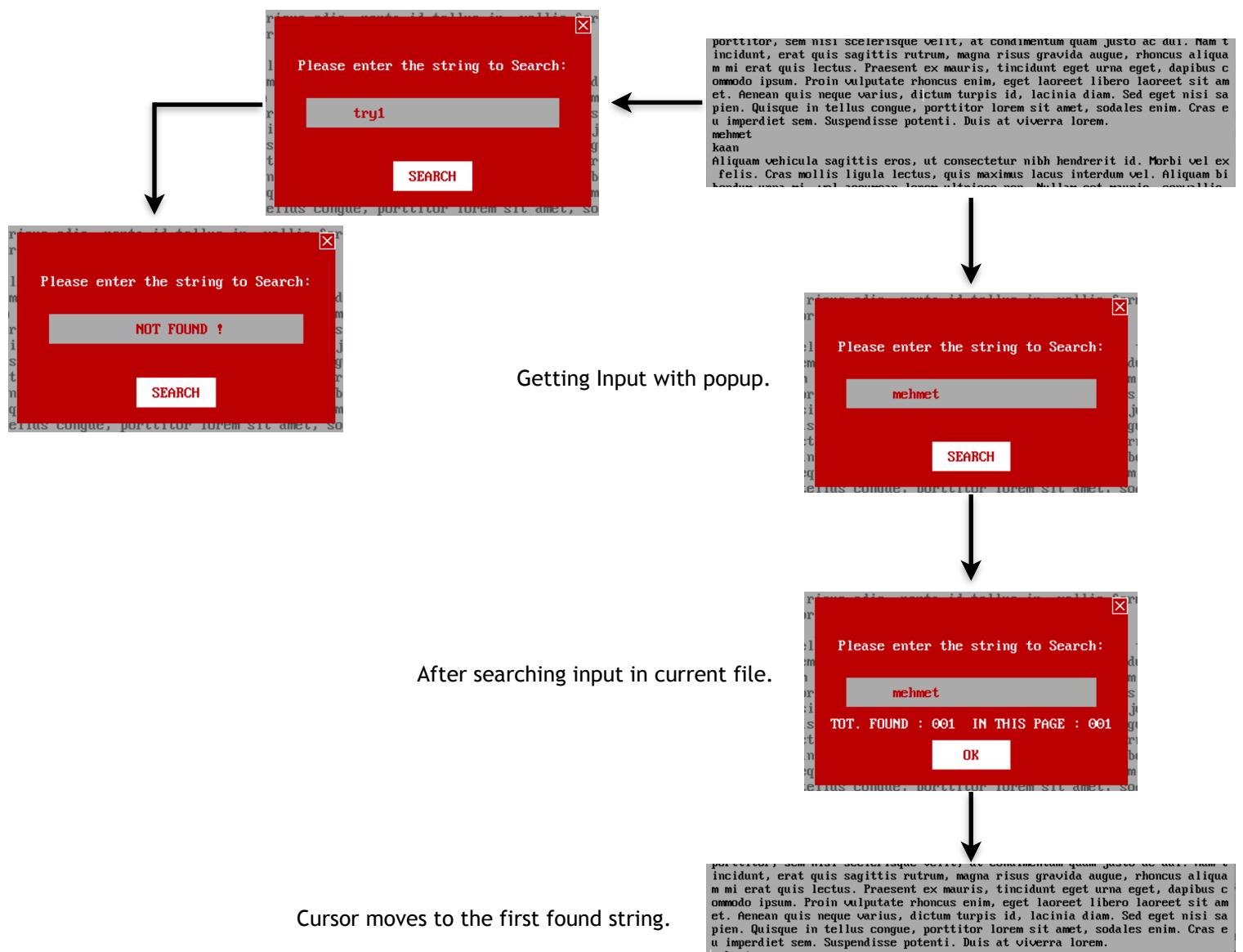
Changed File Response:



SOME ADDITIONAL FUNCTIONS:

F5 - Find:

It can find all case of the input("TexT", "texT", "TEXT") and cursor moves to the first found string.



CODE:

```

FIND_ALGORITHM PROC
    MOV BX,offset FOUND_NUM
    MOV [BX],0

    CALL TEMP_STORE
    CALL TEMP_LOWER_CASE

    MOV BX,offset FILE_LEN
    MOV BP,[BX]
    MOV BX,DS
    MOV ES,BX

    MOV BX,offset FIND_WORD_LEN
    MOV CX,[BX]
    LEA SI, FIND_WORD
    LEA DI, FILE_DUMMY
    SEARCH_L:
        CLD; Clear the direction flag
        REPE CMPSB
        JNE MISMATCH
        MOV BX,offset FIND_WORD_LEN
        MOV CX,[BX]
        LEA SI, FIND_WORD

        SUB DI,CX
        MOV BX,offset FOUND_NUM
        MOV DX,[BX]
        SHL DX,1
        MOV BX,offset FOUND_INDEX
        ADD BX,DX
        MOV [BX],DI
        INC DI

        MOV BX,offset FOUND_NUM
        MOV DX,[BX]
        INC DX
        MOV [BX],DX

        CMP BP,0
        JNZ SEARCH_L

        MOV BX,0A000h
        MOV ES,BX
        JMP EXIT

    MISMATCH:
        MOV DX,CX
        MOV BX,offset FIND_WORD_LEN
        MOV CX,[BX]
        LEA SI, FIND_WORD

        DEC BP
        JNZ SEARCH_L

        MOV BX,0A000h
        MOV ES,BX

    RET
FIND_ALGORITHM ENDP

```

F6 - Find and Replace:

It can find all case of the input("TexT","texT","TEXT") and move the cursor to first found. Also change them all with second input.

```
File : gazi.txt          Line : 001 Column : 38
Kaan
Lorem ipsum dolor sit amet, fatma kaan consectetur adipiscing elit. Aliquam mattis euismod libero, blandit rhoncus elit hendrerit at. Maecenas maximus conse-
quat erat, non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nulla tristique sed augue a finibus. Curabitur ut suscipit velit, sit
amet congue elit. Phasellus tincidunt eros vel pretium kaan blandit. Nulla vitae mi enim. Proin risus odio, porta id tellus in, mollis fermentum neque. Sed
enim mauris, tempor eu dui eu, hendrerit posuere nisl.
kaan
Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesuada
```



```
REPLACE_ALGORITHM PROC
    MOV AX,DS
    MOV ES,AX

    MOV BX,offset FOUND_NUM
    MOV BP,[BX]
    MOV BX,offset REPLACE_WORD_LEN
    MOV CX,[BX]
    MOV AX,CX

    MOV BX,offset FOUND_INDEX
    MOV DX,BP
    SHL DX,1
    ADD BX,DX
    DEC BX
    DEC BX

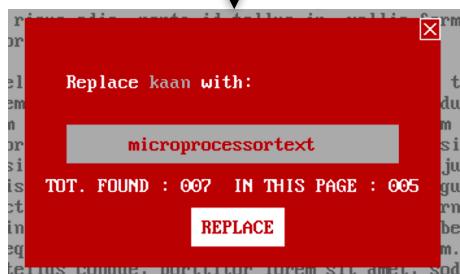
    REP_LOOP:
    MOV DI,[BX]
    SUB DI,5000

    PUSH AX
    PUSH BX
    PUSH CX
    PUSH DX
    PUSH BP
    PUSH DI

    CALL MEM_ADJUST_REPLACE

    POP DI
    POP BP
    POP CX
    POP DX
    POP BX
    POP AX

    FIN REP_LOOP:
    MOV AX,0A000H
    MOV ES,AX
    RET
REPLACE_ALGORITHM ENDP
```

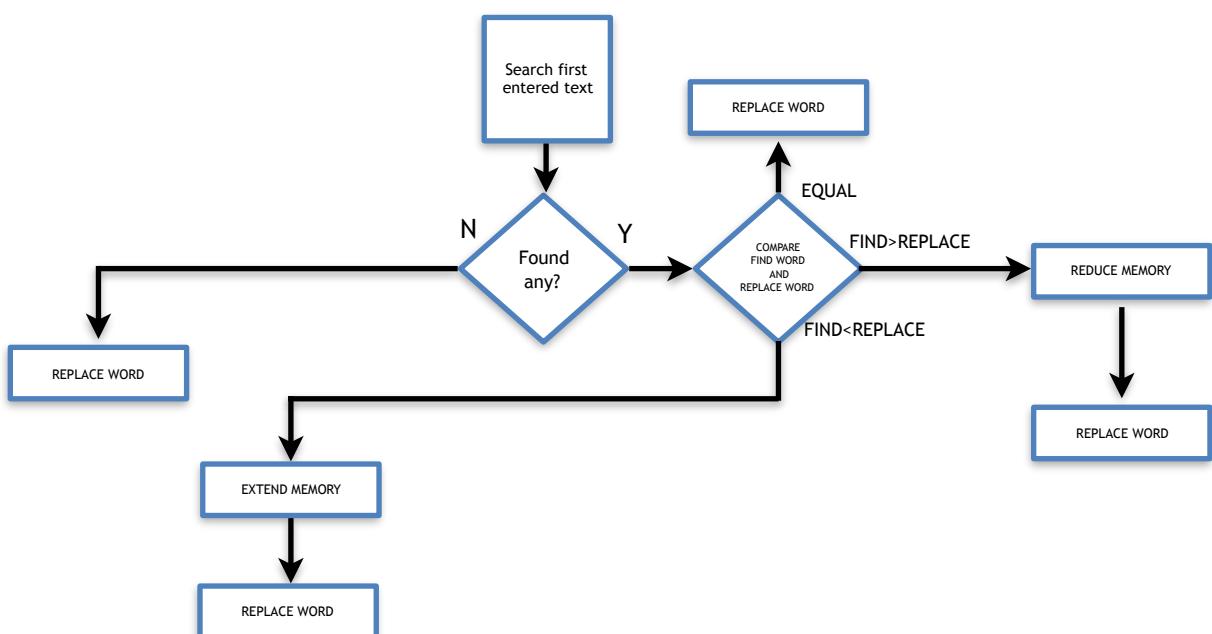


```
File : gazi.txt          Line : 001 Column : 03
microprocessortext
Lorem ipsum dolor sit amet, fatma microprocessortext consectetur adipiscing eli.
it. Aliquam mattis euismod libero, blandit rhoncus elit hendrerit at. Maecenas
maximus consequat erat, non faucibus lacus lacinia at. Cras ultrices nulla ut
odio varius commodo. Nulla tristique sed augue a finibus. Curabitur ut suscip
it velit, sit amet congue elit. Phasellus tincidunt eros vel pretium microproc
essortext blandit. Nulla vitae mi enim. Proin risus odio, porta id tellus in,
mollis fermentum neque. Sed enim mauris, tempor eu dui eu, hendrerit posuere n
isl.
microprocessortext
Ut vel lacus eu tellus gravida pretium. Cras efficitur nisi tellus, at malesua
```

It's almost same process with Find Process except replacing option.

Replacing has no problem when searched word and replacing word are same.

Otherwise, I need an algorithm to extend or reduce restored file memory when different length words are entered. But after extending and reducing memory, found pointers slide. I found a solution to solve that, I start last found word and continue to first word.



F7 - Capitalize Sentences:

It can capitalize sentences. It capitalize the first character, first character after dot and first character after new line. After capitalizing, editor does nothing when user presses again F7 except there is a change in the file.

```
CAPITALIZE_SENTENCES PROC
    MOV BX, offset FILE_LEN
    MOV CX, [BX]
    MOV DX, CX

    MOV BX, offset FILE_RESTORE
    L_CAP_SENT:
    MOV AL, [BX]

    CMP AL, 0Ah ; NEW LINE
    JZ SPACE_COUNT_SENT

    CMP AL, 02Eh ; DOT
    JZ SPACE_COUNT_SENT

    CMP CX, DX
    JZ FIRST_CHAR_SENT

    INC BX

    CMP AL, 1Ah
    JZ FIN_CS_LOOP

    CONT_CAP_SENT_LOOP:
    LOOP L_CAP_SENT

    FIN_CS_LOOP:
    MOV DI, 2400
    CALL BACKGROUND_GRAY_EDITOR

    MOV BX, offset TEMP_PAGE
    MOV AX, [BX]
    MOV DX, 78
    DIV DL
    SHL AX, 1

    MOV BX, offset NEXTLINE_PAGES
    ADD BX, AX

    MOV DX, [BX]
    MOV BX, offset NEXTLINE_TEMP
    MOV [BX], DX

    MOV BX, offset CAP_SENT_FLAG
    MOV DX, 1
    MOV [BX], DX

    RET
CAPITALIZE_SENTENCES ENDP
```

File : gazi.txt Line : 009 Column : 42

```
lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam mattis euismod libero, blandit rhoncus elit hendrerit at. Maecenas maximus consequat erat, non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nulla tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proin risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tempor eu dui eu, hendrerit posuere nisl. Deneme . Kaan deneme
ut vel lacus eu tellus gravida pretium. cras efficitur nisi tellus, at malesuada
```



File : gazi.txt Line : 009 Column : 42

```
lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam mattis euismod libero, blandit rhoncus elit hendrerit at. Maecenas maximus consequat erat, non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nulla tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proin risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tempor eu dui eu, hendrerit posuere nisl. Deneme . Kaan deneme
ut vel lacus eu tellus gravida pretium. cras efficitur nisi tellus, at malesuada
```

F8 - Capitalize Words:

It can capitalize words. It capitalize the first character, first character after dot , first character after new line and first character after space. After capitalizing, editor does nothing when user presses again F8 except there is a change in the file.

File : gazi.txt Line : 001 Column : 01

```
h
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Aliquam mattis euismod libero, blandit rhoncus elit hendrerit at. Maecenas maximus consequat erat, non faucibus lacus lacinia at. Cras ultrices nulla ut odio varius commodo. Nulla tristique sed augue a finibus. Curabitur ut suscipit velit, sit amet congue elit. Phasellus tincidunt eros vel pretium blandit. Nulla vitae mi enim. Proin risus odio, porta id tellus in, mollis fermentum neque. Sed enim mauris, tempor eu dui eu, hendrerit posuere nisl.
Ut vel lacus eu tellus gravida pretium. cras efficitur nisi tellus, at malesuada
```



File : gazi.txt Line : 001 Column : 01

```
h
Lorem Ipsum Dolor Sit Amet, Consectetur Adipiscing Elit. Aliquam Mattis Euismod D Libero, Blandit Rhoncus Elit Hendrerit At. Maecenas Maximus Consequat Erat, Non Faucibus Lacus Lacinia At. Cras Ultrices Nulla Ut Odio Varius Commodo. Nulla Tristique Sed Augue A Finibus. Curabitur Ut Suscipit Velit, Sit Amet Congue Elit. Phasellus Tincidunt Eros Vel Pretium Blandit. Nulla Vitae Mi Enim. Proin Risus Odio, Porta Id Tellus In, Mollis Fermentum Neque. Sed Enim Mauris, Tempor Eu Dui Eu, Hendrerit Posuere Nisl.
Ut Vel Lacus Eu Tellus Gravida Pretium. Cras Efficitur Nisi Tellus, At Malesuada
```

```
CAPITALIZE_WORDS PROC
    MOV BX, offset FILE_LEN
    MOV CX, [BX]
    MOV DX, CX

    MOV BX, offset FILE_RESTORE
    L_CAP_WORD:
    MOV AL, [BX]

    CMP AL, 20h ; SPACE
    JZ SPACE_COUNT

    CMP AL, 0Ah ; NEW LINE
    JZ SPACE_COUNT

    CMP AL, 02Eh ; DOT
    JZ SPACE_COUNT

    CMP AL, 02Ch ; COMMA
    JZ SPACE_COUNT

    CMP CX, DX
    JZ FIRST_CHAR

    INC BX

    FIN_CW_LOOP:
    MOV BX, offset NEXTLINE_PAGES
    ADD BX, AX

    MOV DX, [BX]
    MOV BX, offset NEXTLINE_TEMP
    MOV [BX], DX

    MOV BX, offset CAP_WORDS_FLAG
    MOV DX, 1
    MOV [BX], DX

    RET
FIRST_CHAR:
    CALL CHAR_CHECK
    CMP BP, 2
    JNZ PASS_FIRST_CHAR

    XOR AL, 20h
    MOV [BX], AL

    PASS_FIRST_CHAR:
    INC BX
    JMP CONT_CAP_LOOP

    SPACE_COUNT:
    INC BX
    MOV AL, [BX]
    CALL CHAR_CHECK
    CMP BP, 2
    JNZ PASS_SPACE_CHAR

    XOR AL, 20h
    MOV [BX], AL

    PASS_SPACE_CHAR:
    JMP CONT_CAP_LOOP
CONT_CAP_LOOP:
LOOP L_CAP_WORD
CAPITALIZE_WORDS ENDP
```