Computer Architecture Assignment

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Contents

Introduction

This is a report for the C Program written for the following needs

- Find the computer's MAC Address and the Computer name.
- Getting 20 inputs from the user and print the given number with its square value of the number Infront of the given number with the system time. (Then the count should be print before the given number)
- Improve the above program in order to write the above program in a text file
- Finally, we want to improve the above program to read previously saved text file from the hard disk and display the with the current time

Different Technology and Codes use to develop the program

When writing this program, I used various different Technologies and Codes. I mainly used File Handling in C Programming Language. Other than that,

- How to get the MAC Address and the Computer Name of a particular Computer.

Here is the code snippet for getting the MAC Address and The Computer Name:

```
7 system("getmac");
8 system("hostname");
```

system("getmac"); - This is for getting the MAC Address of a particular Computer

system("hostname"); - This is for getting the Computer Name Of a particular computer.

- How to get the System time

Below is the C code snippet for getting the system time.

time.h header is for the time_t variable type.

```
1 #include <stdio.h>
2 #include <time.h>
```

```
14 time_t t;
15 time(&t);
```

And here is the code snippet for how to print it:

```
22          printf("%d | Number You Entered: %d Square Of the Number: %d
    Computer Time: %s", i, n, n*n, ctime(&t));
```

Source Code

This is the source code of the program.

File - C:\Users\Mewni\CLionProjects\CA Assignment\main.c

```c
1 #include <stdio.h>
2 #include <stdlib.h> //for exit()
3 #include <time.h>
4
5 int main() {
6
7     system("getmac");
8     system("hostname");
9
10    FILE*fp;   //File pointer to hold reference to our file
11    FILE*fptr;
12    int n,i;
13    char c;
14    time_t t;
15    time(&t);
16    fp = fopen("C:\\Users\\Mewni\\Documents\\CA_Assignment\\text.txt"
   , "w");
17
18    printf("\nInput 20 numbers :) \n");
19    for(i=1; i<=20; i++) {
20        printf("\nNumber %d: ",i);
21        scanf("%d", &n);
22        printf("%d | Number You Entered: %d Square Of the Number: %d
   Computer Time: %s", i, n, n*n, ctime(&t));
23        fprintf(fp, "%d | Number You Entered: %d Square Of the Number
   : %d Computer Time: %s", i, n, n*n, ctime(&t));
24    }
25
26    // close the file
27    fclose(fp);
28
```

```c
29      // open the file
30      fptr = fopen("C:\\Users\\Mewni\\Documents\\CA_Assignment\\text.
   txt", "r");   // open file in (r) read mode
31      if (fptr == NULL)
32      {
33          printf("Cannot open file \n");
34          exit(0);
35      }
36
37      // Read content from file
38      c = fgetc(fptr);
39      while (c != EOF)
40      {
41          time_t now;
42          time(&now);
43          printf ("%c", c);
44          c = fgetc(fptr);
45
46          if(c=='\n')
47          {
48              printf(" Read at: %s", ctime(&now));
49          }
50      }
51
52      // close the file
53      fclose(fptr);
54      return 0;
55 }
56
```

Output of Each Program on The Screen

- Code snippet of the program for getting Computer's MAC Address and the Computer's Name

```
7 system("getmac");
8 system("hostname");
```

Output of the Program:

```
Physical Address     Transport Name

===================  =======================================================
50-E0-85-52-29-E3    \Device\Tcpip_{A27C7439-D5CF-4586-8614-7CE13423FB4E}
50-E0-85-52-29-E7    Media disconnected
00-FF-9F-87-FC-AD    Media disconnected
00-50-56-C0-00-01    \Device\Tcpip_{755BAE40-CFC8-4FD9-B1D9-6A87BBE169C0}
00-50-56-C0-00-08    \Device\Tcpip_{C2A3FA64-97FA-4B0F-9935-A3A5B1035035}
LAPTOP-KIP2MIM5
```

- Code snippet of the program for input 20 numbers and print the count, Number you entered, Square of the Number and The Computer Time:

```
18        printf("\nInput 20 numbers :) \n");
19      for(i=1; i<=20; i++) {
20          printf("\nNumber %d: ",i);
21          scanf("%d", &n);
22          printf("%d | Number You Entered: %d Square Of the Number: %d
    Computer Time: %s", i, n, n*n, ctime(&t));
```

Output of the Program:

```
Input 20 numbers :)

Number 1:2
 2
1 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020


Number 2:3
 3
2 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020


Number 3:4
 4
3 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020


Number 4:5
 5
4 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020


Number 5:6
 6
5 | Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020


Number 6:7
 7
6 | Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020
```

```
Number 7:8
 8
7 | Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020


Number 8:9
 9
8 | Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020


Number 9:2
 2
9 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020


Number 10:3
 3
10 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020


Number 11:4
 4
11 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020


Number 12:5
 5
12 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020


Number 13:6
 6
13 | Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020
```

```
Number 14:7
 7
14 | Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020


Number 15:8
 8
15 | Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020


Number 16:9
 9
16 | Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020


Number 17:2
 2
17 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020


Number 18:3
 3
18 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020


Number 19:4
 4
19 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020


Number 20:5
 5
20 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020
```

- Code snippet of the program to write the output in a text file:

File pointer to hold the reference to the file:

```
10      FILE*fp;  //File pointer to hold reference to our file
```

Opening the text file:

```
16      fp = fopen("C:\\Users\\Mewni\\Documents\\CA_Assignment\\text.txt"
   , "w");
```

Writing in to the text file:

```
23          fprintf(fp, "%d | Number You Entered: %d Square Of the Number
   : %d Computer Time: %s", i, n, n*n, ctime(&t));
```

Closing the text file:

```
26      // close the file
27      fclose(fp);
```

Output Of the Program: *The values we entered saved in a text file.*

```
text.txt - Notepad                                                    —    □    ×

File  Edit  Format  View  Help
1 |  Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020
2 |  Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020
3 |  Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020
4 |  Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020
5 |  Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020
6 |  Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020
7 |  Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020
8 |  Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020
9 |  Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020
10 |  Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020
11 |  Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020
12 |  Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020
13 |  Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020
14 |  Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020
15 |  Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020
16 |  Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020
17 |  Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020
18 |  Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020
19 |  Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020
20 |  Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020

                                    Ln 1, Col 1        100%   Windows (CRLF)    UTF-8
```

- Code Snippet of the program for read the saved data in the text file and display with the current system time.

File Pointer to hold reference to our file:

```
11      FILE*fptr;
```

```
13      char c;
```

Open the file:

```
29      // open the file
30      fptr = fopen("C:\\Users\\Mewni\\Documents\\CA_Assignment\\text.
   txt", "r");  // open file in (r) read mode
31      if (fptr == NULL)
32      {
33          printf("Cannot open file \n");
34          exit(0);
35      }
```

Read content from the file and display with the current system time:

```
37      // Read content from file
38      c = fgetc(fptr);
39      while (c != EOF)
40      {
41          time_t now;
42          time(&now);
43          printf ("%c", c);
44          c = fgetc(fptr);
45
46          if(c=='\n')
47          {
48              printf(" Read at: %s", ctime(&now));
49          }
50      }
```

Close the file:

```
52      // close the file
53      fclose(fptr);
54      return 0;
55 }
```

Output of the Program:

```
1 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49 2
020

2 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49 2
020

3 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

4 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

5 | Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

6 | Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

7 | Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

8 | Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

9 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49 2
020
```
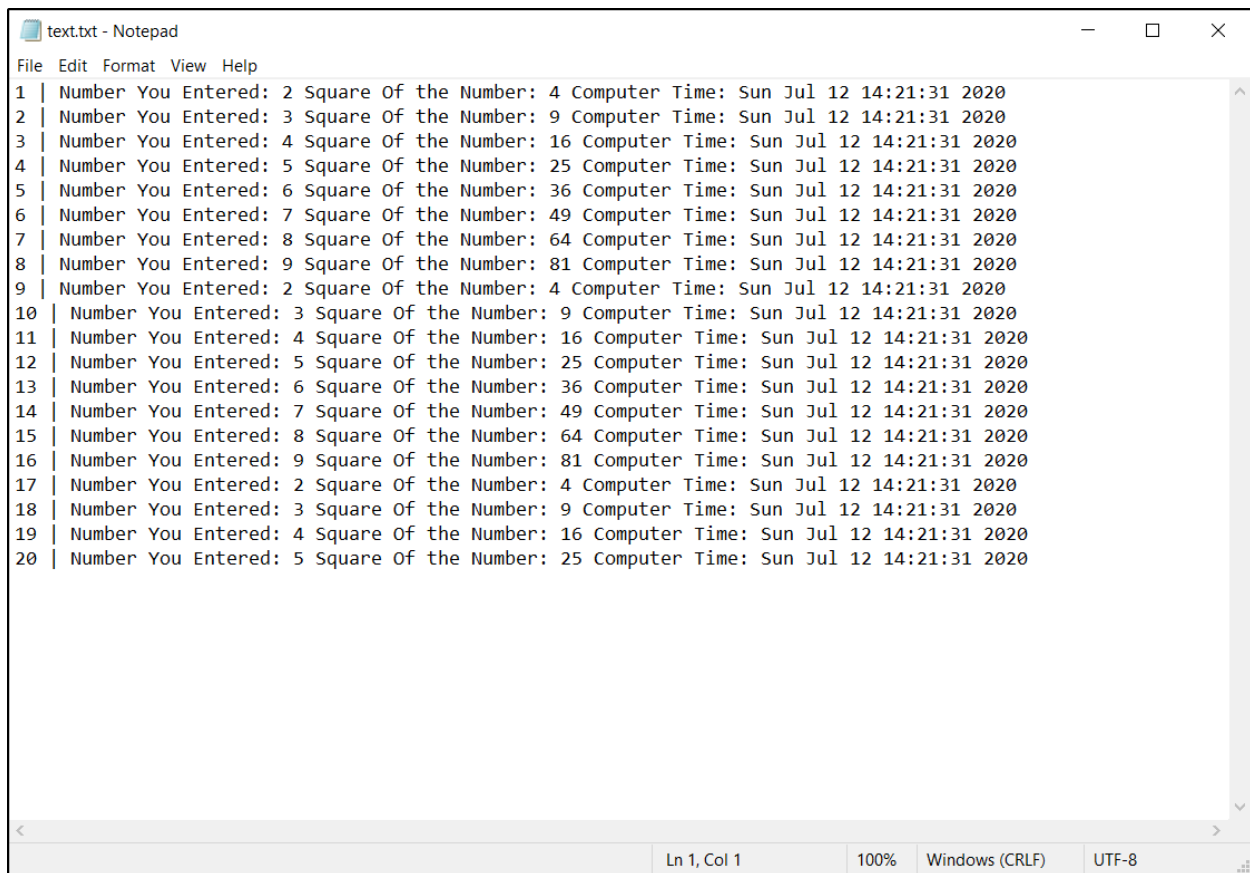
```
10 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

11 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

12 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

13 | Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

14 | Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

15 | Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

16 | Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

17 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020

18 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
2020
```

```
19 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
   2020

20 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020 Read at: Sun Jul 12 14:21:49
   2020
```

Saved Text File

```
text.txt - Notepad                                                    —    □    ✕
File  Edit  Format  View  Help
1 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020
2 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020
3 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020
4 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020
5 | Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020
6 | Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020
7 | Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020
8 | Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020
9 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020
10 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020
11 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020
12 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020
13 | Number You Entered: 6 Square Of the Number: 36 Computer Time: Sun Jul 12 14:21:31 2020
14 | Number You Entered: 7 Square Of the Number: 49 Computer Time: Sun Jul 12 14:21:31 2020
15 | Number You Entered: 8 Square Of the Number: 64 Computer Time: Sun Jul 12 14:21:31 2020
16 | Number You Entered: 9 Square Of the Number: 81 Computer Time: Sun Jul 12 14:21:31 2020
17 | Number You Entered: 2 Square Of the Number: 4 Computer Time: Sun Jul 12 14:21:31 2020
18 | Number You Entered: 3 Square Of the Number: 9 Computer Time: Sun Jul 12 14:21:31 2020
19 | Number You Entered: 4 Square Of the Number: 16 Computer Time: Sun Jul 12 14:21:31 2020
20 | Number You Entered: 5 Square Of the Number: 25 Computer Time: Sun Jul 12 14:21:31 2020

                              Ln 1, Col 1        100%   Windows (CRLF)   UTF-8
```

Discussion and Knowledge that I have achieved

1)Got to know about time.h header, which is define 4 variable types to manipulate date and time.

Here are the 4 variable types,
- size_t
- clock_t
- time_t
- struct tm

I used time_t variable type in my program to store the calendar time.

2)Got to know about stdlib.h header, which I used for the exit( )

3)Got to know about file handling in C language, as listed below,

- Writing a file:

```
16      fp = fopen("C:\\Users\\Mewni\\Documents\\CA_Assignment\\text.txt"
    , "w");
```

```
23          fprintf(fp, "%d | Number You Entered: %d Square Of the Number
    : %d Computer Time: %s", i, n, n*n, ctime(&t));
```

fopen() is for opening a file.

"w" – This is for search files and if the file we are searching exit the content is overwritten and if there is no file a new file is created.

- Reading a file:

Following code snippet open file in read mode:

```
30      fptr = fopen("C:\\Users\\Mewni\\Documents\\CA_Assignment\\text.
    txt", "r");  // open file in (r) read mode
```

Following Code Snippet Read the content from the file

```
37      // Read content from file
38      c = fgetc(fptr);
39      while (c != EOF)
40      {
41          time_t now;
42          time(&now);
43          printf ("%c", c);
44          c = fgetc(fptr);
45
46          if(c=='\n')
47          {
48              printf(" Read at: %s", ctime(&now));
49          }
50      }
```

To read the data from the file I used **fgetc()** function. This function is defined in **stdio.h** header file.

- Closing a file:

```
52      // close the file
53      fclose(fptr);
54      return 0;
55 }
```

fclose() is for closing a file.

4) Got to know how to get the Computer's MAC Address and the Computer Name in C Programming Language.

```
7 system("getmac");
8 system("hostname");
```

system("getmac"); - This is for getting the MAC Address of the Computer

system("hostname") – This is for getting the Computer Name