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Github: eric915c   CSC415 Operating Systems

Assignment 2 – Struct and Buffer

Description:
The assignment 2 - Struct and Buffer provides an opportunity to apply structures, pointers, character strings, enumerated types, bitmap fields, and the buffering of data into blocks.

Approach:
1. Using malloc function to allocate memory for 'personalInfo' structure, and check if inside the pointer 'info' is empty. If the memory size is empty, return it.
2. Assigning values to structure members, various fields of the 'personalInfo' structure are assigned values. It seems to take some arguments from the command line (argv) and assigns them to the corresponding fields.
3. The message provided in argv[3] is copied to the message field of the personalInfo structure using strncpy. It ensures that only a maximum of 100 characters are copied to avoid buffer overflow.
4. Using a function 'writePersonalInfo(info)' to save the personal information.
5. The program then enters a loop to read strings using the 'getNext()' function until it return NULL, and indicating no more strings to process.
    I. There's an inner loop to process the current string. It calculates the remaining length of the string and copies portions of it to a buffer of size BLOCK_SIZE.
    II. The 'commitBlock(buffer)' processes the data in the buffer. And using 'memset' to prepare it for the next block or data.
6. After the outer loop exits, if there is remaining data in the buffer that has not been committed, it commits it for further processing.
7. Using the function called 'free(info)' to allocate memory for the info structure to prevent memory leaks.
8. Using 'checkIt()' function to perform some checking and returns its result as the exit code of the program.

Issues and Resolutions:

My issue was there were no firstName and lastName shown in the output.

```
                        CHECK
Running the check for
END-OF-ASSIGNMENT

Name check is -70 by -67
Student ID: 923446482, Grade Level: Junior
Languages: 8389701
Message:
Four score and seven years ago our fathers brought forth on this continent, a ne
w nation, conceived

The Check Succeded (0, 0)
000000: 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00 | ................
000010: D2 AC 0A 37 13 00 00 00  45 04 80 00 46 6F 75 72 | ??.7....E.?.Four
000020: 20 73 63 6F 72 65 20 61  6E 64 20 73 65 76 65 6E |  score and seven
000030: 20 79 65 61 72 73 20 61  67 6F 20 6F 75 72 20 66 |  years ago our f
000040: 61 74 68 65 72 73 20 62  72 6F 75 67 68 74 20 66 | athers brought f
000050: 6F 72 74 68 20 6F 6E 20  74 68 69 73 20 63 6F 6E | orth on this con
000060: 74 69 6E 65 6E 74 2C 20  61 20 6E 65 77 20 6E 61 | tinent, a new na
000070: 74 69 6F 6E 2C 20 63 6F  6E 63 65 69 76 65 64 20 | tion, conceived
```

I resolved it by assigning 'argv[1]' to firstName and 'argv[2]' assigning to lastName. Let array of string 'argv[]' pointers to specific command line argument and display them.

Analysis:

```
END-OF-ASSIGNMENT
000000: 5E 13 B8 2E FD 7F 00 00  64 13 B8 2E FD 7F 00 00 | ^.?.?..d.?.?..
000010: D2 AC 0A 37 13 00 00 00  45 04 80 00 46 6F 75 72 | ??.7....E.?.Four
000020: 20 73 63 6F 72 65 20 61  6E 64 20 73 65 76 65 6E |  score and seven
000030: 20 79 65 61 72 73 20 61  67 6F 20 6F 75 72 20 66 |  years ago our f
000040: 61 74 68 65 72 73 20 62  72 6F 75 67 68 74 20 66 | athers brought f
000050: 6F 72 74 68 20 6F 6E 20  74 68 69 73 20 63 6F 6E | orth on this con
000060: 74 69 6E 65 6E 74 2C 20  61 20 6E 65 77 20 6E 61 | tinent, a new na
000070: 74 69 6F 6E 2C 20 63 6F  6E 63 65 69 76 65 64 20 | tion, conceived
```

1. The first line shows the hexadecimal values: 5E 13 B8 2E FD 7F 00 00 64 13 B8 2E FD 7F 00 00
   The ASCII representation on the right is not entirely printable, so it shows some non-printable characters.
2. The second line continues with hexadecimal values: D2 AC 0A 37 13 00 00 00 45 04 80 00 46 6F 75 72
   The ASCII representation on the right starts with recognizable characters "E" and "Four."
3. The ASCII representation on the right side of each line provides a readable interpretation of the hexadecimal values.

Screen shot of compilation:

```
student@student:~/csc415-assignment2-bufferandstruct-eric915c$ make run
gcc -c -o Chen_PoHan_HW2_main.o Chen_PoHan_HW2_main.c -g -I.
gcc -o Chen_PoHan_HW2_main Chen_PoHan_HW2_main.o assignment2.o -g -I.
./Chen_PoHan_HW2_main PoHan Chen "Four score and seven years ago our fathers bro
ught forth on this continent, a new nation, conceived in Liberty, and dedicated
to the proposition that all men are created equal."
```

Screen shot(s) of the execution of the program:

```
---------------------------------- CHECK ----------------------------------
Running the check for PoHan Chen
Name check is 0 by 0
Student ID: 923446482, Grade Level: Junior
Languages: 8389701
Message:
Four score and seven years ago our fathers brought forth on this continent, a ne
w nation, conceived

The Check Succeded (0, 0)

END-OF-ASSIGNMENT
000000: 5E 63 CD 22 FE 7F 00 00   64 63 CD 22 FE 7F 00 00 | ^c?"?..dc?"?..
000010: D2 AC 0A 37 13 00 00 00   45 04 80 00 46 6F 75 72 | ??.7....E.?.Four
000020: 20 73 63 6F 72 65 20 61   6E 64 20 73 65 76 65 6E |  score and seven
000030: 20 79 65 61 72 73 20 61   67 6F 20 6F 75 72 20 66 |  years ago our f
000040: 61 74 68 65 72 73 20 62   72 6F 75 67 68 74 20 66 | athers brought f
000050: 6F 72 74 68 20 6F 6E 20   74 68 69 73 20 63 6F 6E | orth on this con
000060: 74 69 6E 65 6E 74 2C 20   61 20 6E 65 77 20 6E 61 | tinent, a new na
000070: 74 69 6F 6E 2C 20 63 6F   6E 63 65 69 76 65 64 20 | tion, conceived

student@student:~/csc415-assignment2-bufferandstruct-eric915c$
```