

## Assignment 2 – Structure in Memory and Buffering

### Description:

This assignment is to write a C program that receives command line arguments then fill the personalInfo object with it as well as pass some values to the object fields and write it then start receiving and committing strings until it hit NULL. Purpose of this assignment was to gain experience using structures, pointers, character strings, enumerated types, bitmap fields, and buffering data into blocks.

### Approach / What I Did:

The program header Assignment.h and object file Assignment.o was provided to us. So, to build a program I carefully read the steps provided in the Readme file. But the main idea for this assignment was to fill buffer so I simply followed the lecture approach, we get line of characters from the nextline, then we keep track of length of the characters received then we keep filling the index of buffer with one character at a time then once the buffer reaches its maximum capacity i.e. 256 bytes, we commit the buffer and then reset the index of the buffer so that buffer can be filled with whatever remaining character there is and get another line of text. At last, when there are no more lines to get and buffer is not completely filled, we simply commit with whatever we have.

### Issues and Resolutions:

One issue I came up with was assigning language where I was using + instead of |, bit operator. But was an easy fix, one of the classmates dropped the hint. Biggest issue was playing around with the buffer because it had to follow certain steps to successfully fill the buffer and commit it. It had lot of errors due to not being able to empty the buffer then I figured out that buffer needs to be emptied right after the commit, but I wasn't sure how to do that, so I found the easy way to do that by copying empty string into the buffer.

### Analysis:

END-OF-ASSIGNMENT

```
000000: DB 22 57 6B FE 7F 00 00 E2 22 57 6B FE 7F 00 00 | ."Wk....."Wk....
000010: 8A 80 E3 36 03 00 00 00 07 00 00 00 46 6F 75 72 | ...6.....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
```

#Left-side representation of Hexadecimal( checked with %p for firstname and lastname, where values are grouped in two and filled in hexdump backwards)

1.Represents 8 byte pointer value of first name

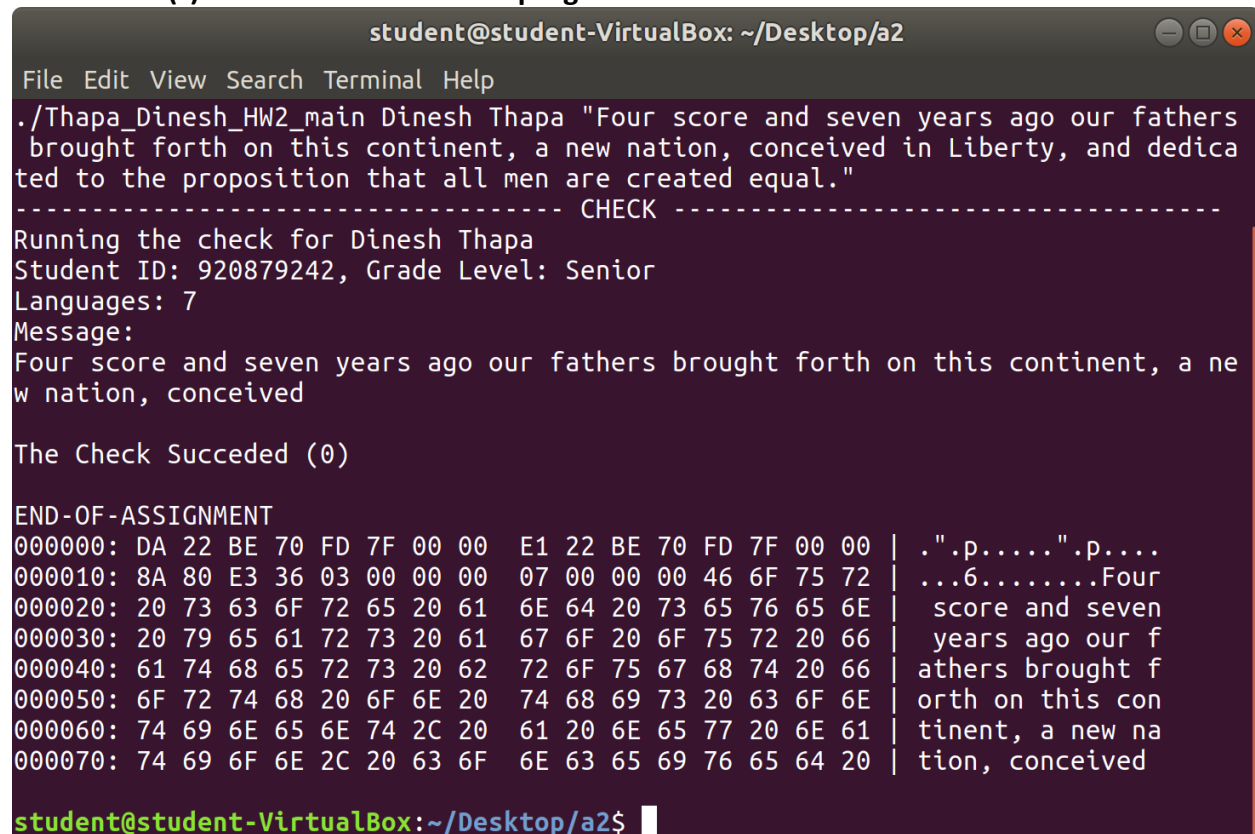
2. Represents 8 byte pointer value of last name
3. Represents 4 byte memory address of studentID
4. Represents 4 byte value of enumtype level.
5. Represents 4 byte value of languages.
6. Represents 100 byte message value in hexadecimal.

#Right is the ASCII representation

**Screen shot of compilation:**

```
student@student-VirtualBox:~/Desktop/a2$ make
gcc -c -o Thapa_Dinesh_HW2_main.o Thapa_Dinesh_HW2_main.c -g -I.
gcc -o Thapa_Dinesh_HW2_main Thapa_Dinesh_HW2_main.o assignment2.o -g -I.
```

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



```
student@student-VirtualBox: ~/Desktop/a2
File Edit View Search Terminal Help
./Thapa_Dinesh_HW2_main Dinesh Thapa "Four score and seven years ago our fathers
brought forth on this continent, a new nation, conceived in Liberty, and dedica
ted to the proposition that all men are created equal."
----- CHECK -----
Running the check for Dinesh Thapa
Student ID: 920879242, Grade Level: Senior
Languages: 7
Message:
Four score and seven years ago our fathers brought forth on this continent, a ne
w nation, conceived

The Check Succeeded (0)

END-OF-ASSIGNMENT
000000: DA 22 BE 70 FD 7F 00 00 E1 22 BE 70 FD 7F 00 00 | ".p.....".p....
000010: 8A 80 E3 36 03 00 00 00 07 00 00 00 46 6F 75 72 | ...6.....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-VirtualBox:~/Desktop/a2$
```