CS308 C Language Laboratory

Lab Activity 4 (v.sp.2022)

Refer to: "User-Defined Types I: Structures" in Canvas
Points: 10
Submission: Upload files in Canvas assignment's page by the due date. Upload the .zip file that contains your solution to Canvas. If only uploading main.c, do not rename the file

Instruction:

Write a C program that creates a structure and displays its content. The program must contain two functions, the main function and a function to display the content of the struct.

1. Define a struct to hold
   - Student's name in a char*,
   - Student's age, and
   - Student's year in school as a (Freshman = 9, Sophomore = 10, Junior = 11, or Senior = 12).
2. In the main function, **dynamically** allocate memory to store the structure and all its fields (remember that the name is of pointer type). Use a pointer variable to hold the reference to the allocated memory for the student.
3. Read in, (from the keyboard), and store it in the memory you just allocated, the student's name, age, and year in school (year in school as int.)
4. Create a separate function with the prototype:

   ```
   void display (struct student* stu);
   ```

   that can be used to display the content of a single student struct. Call this function twice - once for the original content of the structure and again after the structure has been modified (see step 6)

   Note: Display year in school as the strings "Freshman", "Sophomore", "Junior", or "Senior", not 9, 10, 11, 12

6. Increase the student's age by one and upgrade their year in school one level (unless they are already a Senior, display Senior still)
7. Free up all dynamically allocated memory space before exiting
8. Upload your running code to http://pythontutor.com/ and "visualize" the execution of your code.

Grading:

Programs that do not compile will receive a grade of 0. A grading breakdown for programs that do compile is given below:

Correct program implementation (structure, function, allocation and free of memory)	3
Correctness of program execution (all instructor's test cases pass)	4
Correct output format	1
Correctly freeing ALL allocated memory	2
Total	**10**

** You do not need to check off your work. Just upload your solution to Canvas. You are welcome to ask to review your solution before you leave, and we will do it depending on the support other students may need.