CSCD 437
Lab 2
ReadElf/Objdump/Process Image

Your answers will be a PDF named your last name first letter of first name lab2.pdf for all questions below. (Example steinerslab2.pdf)

It is important that you have a fundamental understanding of the process image, how memory is arranged and the differences between the HEAP and the stack.

NOTE: Your answers will be typed. We will not accept any hand drawings.

Your PDF will have screen captures, and drawings that illustrates the following. You will copy and paste the problem statement starting with number four below, and then provide your answer below the problem statement.

1. You must use your provided AWS VM
2. Compile cscd437_w24_lab2.c with gcc -g cscd437_w24_lab2.c -o lab2
3. Run the executable with ./lab2 and capture the full output.
4. Create a memory map of the global variable, the variables in main, and the variables in the function. This will be a detailed memory map image, with the stack, heap, and sections clearly labeled.
5. Using readelf -w[lLiaprmfFsoRtUuTgAckK] ./lab2 capture the .debug_line section
6. Answer the following (copy the question and then state your answer – provide screen captures)
   a) Does the stack grow from high memory to low memory or low memory to high memory? How do you know? Justify your answer.
   b) Is the heap in high memory compared to the stack or low memory compared to the stack? How do you know? Justify your answer?
   c) Based on the memory map from #4, what is odd about how memory is arranged compared to the declarations, especially the declarations in main?
   d) Using readelf/objdump identify where the global variable resides in the process image. State the section header. The answer is **NOT** .data
   e) Using readelf/objdump identify where the array named array resides in the process image. State the section header. NOTE: This is a difficult problem, you will need to spend some time researching the answer, and possibly doing some bit manipulations. HINT: The DWARF4 paper in canvas will help.

TO TURN IN

- A single PDF with appropriate screen captures and drawings
- Questions answered and justifications provided.

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(Example steinerslab2.pdf)