IC221 Lab: Makefiles and Debugging Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Worksheet / Gradesheet AY22S, 95 points total

Part 1 Gradesheet

(15) Task 1 -- Simple compilation makefile:

(30) Task 2 -- Multi-part makefile:

Part 2 Worksheet / Gradesheet

(10) A loop is often identified with an increment of a variable value by one (0x1) using the add instruction. There are two loops in the program. Identify an example of this kind of increment-by-one instruction in each loop, and copy the examples into your worksheet.

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| 0x00000000000006f4 <+138>: add DWORD PTR [rbp-0x54],0x1  Is the first example of an increment by one using the add instruction. It then compares this value and decides whether or not jump. Simulating a loop.  0x000000000000071d <+179>: add DWORD PTR [rbp-0x54],0x1  Is the second example of an increment by one using the add instruction. |

char s1[STRLEN];

8 int s2[STRLEN] = {0xB1, 0xB6, 0xB1, 0xBA, 0xAB, 0xA6, 0xAB, 0xA8, 0xB0, 0xDE, 0xDE, 0};

9

10 for (i=0; i<STRLEN; i++) {

(gdb)

11 s1[i] = ~s2[i];

12 }

13

(10) Give one example of an assembly instruction from main() that assigns a local variable its value using the mov instruction, which copies a value to memory.

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| 0x00000000000006b9 <+79>: mov DWORD PTR [rbp-0x30],0xb0  This example copies the number 32 in hex and assigns it to memory |

info locals

(10) What are the local variable names?

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| The variable names are I, s1, and s2 |

(10) Now that s1 is not obfuscated, what is its secret value?

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| The unobfuscated value of s1 is "NINETYTWO!!” |

(10) Looking at the source code, describe the means by which the string is obfuscated:

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| The string is hidden in a hex int array and the code is the un hidden by running it through a for loop and doing the bitwise negation of the values within s2. |