- CPSC 275: Introduction to Computer Systems

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Fall 2025

- Syllabus
- Schedule
- Resources
- Upload
- Solution

Homework 7

NOTE: You are not required to hand in the following exercises, but you are strongly encouraged to complete them to strengthen your understanding of the concepts covered in class.

1. Assuming the expressions are evaluated on a 32-bit machine that uses two's complement arithmetic, fill in the following table describing the effect of casting and relational operations, as discussed in class:

Expression	Type	Evaluation
`-2147483647-1 == 2147483648U`		
`-2147483647-1 < 2147483647`		
`-2147483647-1U < 2147483647`		
`-2147483647-1 < -2147483647`		
`-2147483647-1U < -2147483647`		

2. In the malicious usage of `memcpy()` [Slide 13, Lecture 7], what value does the parameter `n` have at the beginning of the function? Assume that both unsigned and signed integers on this system are 4 bytes long. Justify your answer.

3. Verify the relationship between unsigned and signed integers illustrated in Slides 7–8 of Lecture 7 by writing a simple program. For example, the following code will verify that casting –1 to unsigned yields `UMAX`:

```
printf("(unsigned)-1 = %u\n", (unsigned)(-1));
```

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