- CPSC 275: Introduction to Computer Systems

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Fall 2025

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Solution to Homework 10

1. A. overflow
   B. overflow
   C. `11111`
   D. `00111`
   E. `10000`

2. A. overflow
   B. `10000`
   C. `11111`
   D. `00111`
   E. overflow

3. A. `1101010`
   B. `overflow`
   C. `overflow`
   D. `overflow`

4. A. `11111111`
   B. `10000000 (overflow)`
   C. `10000001`
5.

```
int uadd_ok(unsigned x, unsigned y)
{
   unsigned sum = x + y;
   return sum >= x;
}
```

6.

```
int tadd_ok(int x, int y)
{
   int sum = x + y;
```

```
    int neg_over = x < 0 && y < 0 && sum >= 0;
    int pos_over = x >= 0 && y >= 0 && sum < 0;
    return !neg_over && !pos_over;
}
```

7. A. This function will give correct values, except when `y` is *TMin*. In this case, we will have `-y` also equal to *TMin*, and so function `tadd_ok` will consider there to be negative overflow any time `x` is negative. In fact, `x-y` does not overflow for these cases.

   B.
```
/* Determine whether arguments can be subtracted without overflow */
int tsub_ok(int x, int y) {
    int diff = x-y;
    int neg_over = x < 0 && y >= 0 && diff >= 0;
    int pos_over = x >= 0 && y < 0 && diff < 0;
    return !neg_over && !pos_over;
}
```

- **Welcome: Sean**
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