Extra review session

CSE 30: Computer Organization and Systems Programming

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ListNode * reverse(ListNode *aNode) {
    if (aNode == NULL) return aNode;
    ListNode * tmp = aNode->next;
    aNode->next = aNode->prev;
    aNode->prev = tmp;
    if (aNode->prev == NULL)
        return aNode;
    return reverse(aNode->prev);
}

data
next
prev

10
next
prev

20
next
prev
C Pointers and Strings

```c
char name1[] = "frank";
char *name2 = "frank"
```

```c
sizeof (name1) = ?
sizeof (name2) = ?
```

What is the difference between the memory diagram of name1 & name2?
Memory maps and pointers

- char * arr[3];

Using the memory map on the left draw a pointer diagram for the multi-level array “arr.”

What is arr+1?
Memory maps and pointers

- Assume p is mapped to r0. Identify dangling pointers

```
int ***p;
int (**p)[2];
```

What is?
1. p
2. p+1
3. *p
4. *(p+1)
Memory maps and pointers

- Assume `p` is mapped to `r0`. Identify dangling pointers

```
int *(*p)[2];
int (*p)[2][3];
```

What is `p+1` in each case?
Memory maps and pointers

- Assume p is mapped to r0. Identify dangling pointers

```
int **p[2];

int (*p[2])[3];
```

What is p+1 in each case?
int compute_FIR( int* h, int* z, int ntaps, int input) {
    int ii;
    int accum;
    z[0] = input;
    accum = h[ntaps - 1] * z[ntaps - 1];
    for (ii = ntaps - 2; ii >= 0; ii--) {
        accum += h[ii] * z[ii];
        z[ii + 1] = z[ii];
    }
    return accum;
}
Number representation

Most positive (4-bit)       Most negative (4-bit)

- Unsigned
- Sign and magnitude
- 1’s complement
- 2’s complement

Condition for overflow:
Bitwise and Logical

- a: 1100 0011, b: 0011 1100
- Write the result of the following expressions
  - a==b
  - a && b
  - a & b
  - a || b
  - a | b
  - a!=b
  - ~a
  - a^b

```
int x=10, *p;
if (p && (*p==10))  /* Would this result in a segfault? */
```
GOOD LUCK FOR THE FINAL!