First Midterm

- Next class, Tuesday, February 7
- Closed book, closed computer
- One page of notes (standard letter paper, one side only)
- Not likely to be time pressure

- Topics
  - Tracing SML expressions and functions
  - Inferring types
  - Using built-in functions like `length`, `map`, `rev`, . . .
  - Writing SML functions (recursion!)

- A few examples follow; watch Piazza for more

Midterm Examples

1. Function to compute the sum of squares of elements in a list of integers

2. `unzip`, the inverse of `zip`: type signature and declaration

3. Type signatures for e, f, and g:

```
fun f x nil     0 = x
  | f x nil     z = e z
  | f x (y::ys) z = if x
                    then f x (y::ys) (z-1)
                    else f x ys z;
fun g u v = v u;
```

Midterm Examples, continued

4. Result:

```
fun checkpoint _ []      = []
  | checkpoint b (x::xs) = if b
                           then x :: (checkpoint (not b) xs)
                           else checkpoint (not b) xs;

checkpoint true ["I", "really", "love", "coding", "SML"];
```

5. Function that does not use booleans and does the same thing as `checkpoint true`

6. Function to create a list of all sublists of a given list