Chapter 1 outline:

- Introduction, sets and elements (last week Monday)
- Set operations; visual verification of set propositions (last week Wednesday)
- Introduction to SML; cardinality and Cartesian products (last week Friday)
- Making types in SML (**Today**)
- Making functions in SML (Friday)

Today: *Making stuff in SML*

- A few follow-up points from last time
- Making our own types
- Making our own operations

1.8.1 What is the cardinality of $\{0, 1, 2, \ldots n\}$?

1.8.3 One might be tempted to think $|A \cup B| = |A| + |B|$, but this is not true in general. Why not? (Assume A and B are finite.)

1.8.6 Describe three distinct partitions of the set $\mathbb{Z}$.

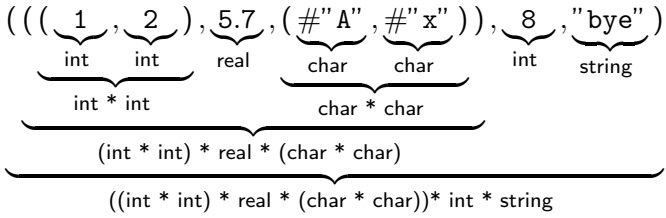
1.9.5 Based on our description of the real number plane as a Cartesian product, explain how a line can be interpreted as a set.

1.9.6 Explain how $\mathbb{C}$, the set of complex numbers, can be thought of as a Cartesian product.

1.9.7 Any rational number (an element of set $\mathbb{Q}$) has two integers as components. Why not rewrite fractions as ordered pairs (for example, $\frac{1}{2}$ as $(1, 2)$ and $\frac{3}{4}$ as $(3, 4)$) and claim that $\mathbb{Q}$ can be thought of as $\mathbb{Z} \times \mathbb{Z}$? Explain why these two sets *cannot* be thought of as two different ways to write the same set. (There are at least two reasons.)

```
#1(5, 4) + int(4.0 / 3.1)
```

```
(5 + 7, String.sub("hello", 2))
```


(((1, 2), 5.7, (#"A", #"x")), 8, "bye")
int
int
real
char
char
int
string
int * int
char * char
(int * int) * real * (char * char)
((int * int) * real * (char * char))* int * string

For next time:

Pg 36: 1.9.(3, 4, 8, 9, 10, 14 & 16)
Pg 40: 1.10.(1-4)

SML problems should still be submitted on paper with the rest of the assignment.

Re-read 1.11 (if necessary)
Skim 1.(12 & 13).

(No quiz)