COMP11120 Lecture notes
Corrigenda

Page 17. Lemma 0.1 should read as follows:

Lemma 0.1

For all natural numbers m and n, where $m \neq 0$, we have

$$n = m \cdot (n \operatorname{div} m) + (n \bmod m).$$

Page 20. Lemma 0.2 should read as follows:

Lemma 0.2

For all integers n, and all integers $m \neq 0$, we have

$$n = m \cdot (n \operatorname{div} m) + (n \bmod m).$$

Page 21. It turns out that the implementation of mod in Java does not work in the same way our mathematical definition does. I have amended Code Example 0.1 as follows.

Code Example 0.1. In Java integer division is implemented. Here is a procedure that returns the result of dividing n by m (as integers).

```
public static int intdiv (int n, int m)
{
    return n/m;
}
```

Similarly there is an implementation of the reemainder of dividing n by m.

```
public static int intmod (int n, int m)
{
    return n % m;
}
```

Note, however, that this does not return the numbers that appears in our definition: If n is negative then n%m is a *negative number*. The way Java implements the two operations ensures that they satisfy Lemma 0.2, that is

n = m∗(n/m) + n%m.

The result of the Java expression n%m is 'equivalent *modulo* m' to the result of $n \bmod m$, see Section 7.3.6. This means that for negative n you can get

$n \bmod m$ by adding m to n%m.

Page 75. Example 2.22 should read as follows:

Example 2.22. In order to refute the claim that for all natural numbers m and n it is the case that

$$m - n = n - m,$$

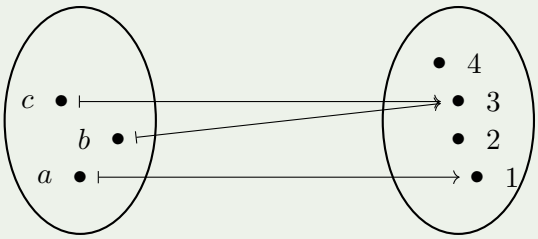
it is sufficient to find *one counterexample*, so by merely writing

$$2 - 1 = 1 \neq -1 = 1 = 2,$$

we have proved that the claim does not hold.

Page 106. In **Example 2.67** the diagram and the text don't fit together. What I intended is the following.

Example 2.67. Consider the function given by the folloiwng diagram.



This function is not surjective since there is no element of the source set that is mapped to the element 4 of the target set.

Page 130. CExercise 50 isn't worded very well. Here is an improved version.

Suppose we have a deck of four cards,

$$\{Q\spadesuit, A\spadesuit, Q\heartsuit, A\heartsuit\}.$$

I draw two cards from this pack so that I can see their values, but you cannot. You tell me to drop one of my cards, and I do so.

You ask me whether I have the ace of spades $A\spadesuit$, and I answer yes.

What is the probability that the card I dropped is also an ace?

Page 142. Example 4.25 does not describe the probability space from Exercise 50. The probability space for that exercise is given as follows:

Example 4.25. The probability space underlying Exercise 50 has as its underlying sample space the set

$$\{\{Q\heartsuit, A\heartsuit\}, \{Q\heartsuit, Q\spadesuit\}, \{Q\heartsuit, A\spadesuit\}, \{A\heartsuit\}, Q\spadesuit\}, \{A\heartsuit\}, A\spadesuit\}, \{Q\spadesuit, A\spadesuit\}\},$$

and the probability for each outcome is $1/6$. The probability distribution is derived from this in the usual way.