Errata in *Discrete Mathematics and Functional Programming*

**Pg 48:** Exercise 1.11.5 mentions replacing Chips with Fries. However, the datatype given in Section 1.10 (available from https://cs.wheaton.edu/~tvandrun/dmfp/sec1-10-own-types.sml) doesn’t have Fries. Either add Fries to the datatype or make this function something like `replaceCarrotSticks`. Thanks to Kyler Dunn.

**Pg 48:** $4! = 4 \cdot 3 \cdot 2 \cdot 1$ should be $4! = 4 \cdot 3 \cdot 2 \cdot 1$. Thanks to Cooper Lazar.

**Pg 50:** I don’t believe there is a way to solve Exercise 1.12.1 using what the student knows at that point and without using ML’s `size`. The best solution would be to turn the string into a list using `explode` and then use the solution to Exercise 2.2.4. The following would work:

```ml
fun charCount("") = 0
  | charCount(s) = 1 + charCount(substring(s, 1, size(s) - 1));
```

…but that’s silly, since if we are allowed to use size anyway, there is no reason to write `charCount`.

**Pg 100:** Exercises 3.2.3 reads $\neg T \lor F \land T \lor T$. This is not an error, but it is inconsistent, since in other examples and exercises I tend to parenthesize expressions fully. Many students miss the brief mention of precedence rules for $\lor$ and $\land$ on pg 98. Read this exercise as $(\neg T \lor (F \land F)) \lor T$.

**Pg 105:** The example in the middle of the page should be $\neg (\neg p \land q) \lor (p \land \neg p) \equiv p \land \neg q$. Note the $p$ on the right is not negated. This affects the original statement of the problem (“Suppose we were to show that $\neg (\neg p \land q) \lor (p \land \neg p) \equiv p \land \neg q$”) and the first three right hand sides of the “Don’t do this” column. Spotted by Caleb Josue Ruiz Torres.

**Pg 121:** “Clearly $u \land p \rightarrow q \lor r$...” should be “Clearly $u \land p \rightarrow q \land r$...”

**Pg 135:** “…has additive” should be “has additive inverse.”

**Pg 136** The premise “If Socrates is a human, then he is mortal” doesn’t match the form $\forall x \in A, P(x)$. Instead it should read “All humans are mortal.” (But then it doesn’t match the argument from Section 3.11... Oh well.)

**Pg 138:** In the first example, step vii should cite iii and vi, not iii and iv. In the second example, step xi should cite iii (and x and d), not iv.

**Pg 139:** Ex 3.14.7 premise a should have “for all $y$ in $B$, $P(x, y)$” parenthesized, that is:

$$(a) \forall x \in A, (\forall y \in B, P(x, y)) \rightarrow Q(x)$$

**Pg 177:** In Exercise 4.10.6, the “termination” condition in Lemma 4.22 is incorrect. It should read:
Lemma 4.22  For all \( a, b \in \mathbb{N} \), there exists unique \( n, r \in \mathbb{W} \) such that 
\[ a = b^n + r \text{ and } 0 \leq r < (b - 1) \cdot b^n. \]

Pg 179: Statement lists are introduced in section 1.3, not section 2.5.

Pg 205: Exercise 5.3.4 should say “requires that \( \mathcal{I}_R(a) = \emptyset \)” , that is, element \( a \) rather than set \( A \). Thanks to Janet Davis.

Pg 208. The intention for Ex 5.4.1 was reflexivity fails for zero. However, the definition of reflexivity does allow \( 0|0 \) even though division by zero is undefined, thanks to Janet Davis.

Pg 222: Ex 5.7.4 should read \( (S \circ R) \circ Q = S \circ (R \circ Q) \).

Pg 260: In Ex 6.2.14, see Section 1.7 (not 2.5) to review the string type.

Pg 335: Ex 7.3.9 should read, “For example, \( \text{filter}(fn(x) \Rightarrow x \mod 2 = \ldots \) ”

Pg 359: In Ex 3.9.3, the fifth bullet (which is the first bullet of the second column of exercises, top right corner) should read

- Either \( f(a) \in F(A - \{a\}) \) or \( f(a) \notin F(A - \{a\}) \).

Pg 450: The part of the figure in the top right corner should read “Then add edge (1, 4) . . . ”, not “Then add edge (3, 4) .”

Pg 513: The first bullet under the chapter goals should read “terms about lattices,” not “terms about graphs.”

Pg 653: The first paragraph under A.1 says that the general forms and set forms were introduced in Chapter 1. They were introduced rather in Chapter 4.

Pg 658: Under “Proving transitivity,” the second step should be “Show that \( a \) is related to \( c \). Hence \( (a, c) \in R \) by . . . “