The Art of Computer Programming

Chapter 1

1.1 Algorithms

1.1 Exercise 1.1.1

The following sequence is the minimum:

$$t \leftarrow a$$
$$a \leftarrow b$$
$$b \leftarrow c$$
$$c \leftarrow d$$
$$d \leftarrow t$$

1.2 Exercise 1.1.2

Proof. After the start, step E1 can only be reached by step E3. However, after E3 has finished, m will have the previous value of n, and n will have the remainder of the division of m by n. The remainer will always be smaller than the divisor, by definition, so n will be always smaller than m. □

Chapter 2

1.2 Mathematical Induction

2.1 Exercise 1.2.1

Start by proving the truth of $P(0)$, and then proceed as usual.

2.2 Exercise 1.2.2

This is a recurrence with two variables: $a(n+1) = F(a(n), a(n-1))$. The induction basis should have two elements, however it was proved only for $a(1)$. You should have proved either $a(0)$ or $a(2)$ to have a valid proof.