Introduction to Computer Science
Jacobs University Bremen
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Course: CH08-320101
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ICS Problem Sheet #2

Problem 2.1: *proof by contrapositive* (4 points)

Let n be a natural number. If n^2 is divisible by 3, then n is divisible by 3.

Prove this statement by proving the contrapositive. (You may want to consider different cases how a number not divisible by 3 can be written.)

Problem 2.2: *proof by induction* (6 points)

Let n be a natural number. Proof that the following is true:

$$0^3 + 1^3 + 2^3 + \ldots + n^3 = \sum_{i=0}^{n} i^3 = \left[\frac{n(n+1)}{2}\right]^2$$