

## Advanced Distributed Algorithms and Data Structures

WS 2016

### Homework Assignment 2

**Problem 1:**

Let  $X_1, X_2, \dots, X_n$  be independent binary random variables with  $\Pr[X_i = 1] = p$  for all  $i \in \{1, \dots, n\}$ , where  $p \in [0, 1]$  is some fixed probability value. Let  $X = \sum_{i=1}^n X_i$ . Determine  $\mathbb{E}[X]$  and  $\mathbb{V}[X]$ .

**Problem 2:**

Prove Theorem 3.4.

**Problem 3:**

Prove Theorem 3.3.