# Homework 1, SPF 2012

*The answers should be typed, and the file converted to pdf format and sent
to D.Kiss@cwi.nl.
(Write "Homework SPF" in the subject line of your email).
Names and student numbers should be clearly indicated in the file.
Deadline is the end of Tuesday October 9.*

**1.** Make Exercise 2.6 in Shreve. (Give a short, clear argumentation/computation;
indicate when a step in the argument uses one of the fundamental properties
in Theorem 2.3.2).

**2.** Let $N$ be an integer $\geq 1$. Consider, for the $N$-period binomial model with
$u = 2$, $d = 1/2$ and $r = 1/4$, a derivative security which gives its owner the
right to buy at time $N$ one share for the stock price of time $N - 1$. (So, the
value $V_N$ at time $N$ of the derivative security is $(S_N - S_{N-1})^+$). Compute,
using results in Chapter 2 of Shreve, the price of the derivative security at
time 0. (Only a few lines of computation is needed; indicate briefly where
and which results in Shreve you use. No long story!).
*Hint: One of the following three is the correct result: $2/5\, S_0$; $S_0/2$; $3/5\, S_0$.*

**3.** For the case $N = 1$ in Exercise 2, give a brief description how this
derivative security can be replicated. (i.e. give $\Delta_0$).

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