RWTH Aachen **SS 2012**
Lehrgebiet Theoretische Informatik Tutorial 8
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Analysis of Algorithms — Tutorial

Problem 8-1

```
f(int n){
  int s=0;
  if (n==0) return 1;
  for (int i=0;i<n;i++)
    s+=f(i);
  return s;
}
```

Compute how often the 5th line of this program is executed using generating functions.

Problem 8-2

Prove that

$$(1+z)^r = \sum_{n=0}^{\infty} \binom{r}{n} z^n,$$

for $n \in \mathbf{N}$ and $r \in \mathbf{R}_{\geq 0}$.

Homework Assignment 8-1 (10 Points)

Solve this recurrence using generating functions:

$$a_n = 2a_{n-1} + 3a_{n-2}$$

and $a_0 = 0$, $a_1 = 2$.