



# Compiler Construction/Fall 2014/Homework 9

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Assigned Thursday 11/6/2014, due Thursday 11/13/2014 at 8am

## Reading Assignments

- Lecture on October 6: Dragon Book 8.1-8.4 + 8.6 (34p) – this homework.
- Lecture on October 13: Dragon Book 8.8 (5p), advanced HACS.

## Homework Assignments

The following assignments should be submitted for a maximum of 10 points (and 10 bonus points).

### 1 Basic Blocks

Here is a small program in the Dragon book intermediate representation. It assumes the integer input parameter  $a$  and computes the output  $f$ .

```
1: i = 1
2: h = 1
3: goto 11
4: s = h
5: h = s + i
6: i = s
7: a = a - 1
8: goto 11
9: f = h
10: return
11: if a>0 goto 4
12: goto 9
```

We will consider this program below.

**Question 1.1** (5 points). What are the basic blocks in the program?

**Question 1.2** (5 points). Can you simplify the code?

**Question 1.3** (10 bonus points). What well-known function  $f$  of  $n$  does the code compute? Explain in detail how; for full points use a formal induction argument.