

Homework 4: More Data Flow Analysis

Due: problems 1-3, April 10, 2006; problem 4, April 12, 2006.

In this homework you will learn more about data flow analysis.

If you wish, you can work in groups.

Section 2.3: Monotone Frameworks

Read section 2.3 of our textbook: *Principles of Programming Analysis* [1].

1. (40 points) Do exercise 2.9.
2. (50 points; extra credit) Do exercise 2.11.
3. (30 points) Do exercise 2.14.

Section 2.5: Interprocedural Analysis

Read section 2.5 of our textbook: *Principles of Programming Analysis* [1].

4. (20 points) Do exercise 2.18. Since we did the Reaching Definitions analysis in class, you are not allowed to choose that, but must pick one of the other three classical analyses from section 2.1.
5. (20 points; extra credit) Do exercise 2.19.
6. (20 points; extra credit) Do exercise 2.20.

Section 2.6: Shape Analysis

Read section 2.6 of our textbook: *Principles of Programming Analysis* [1].

7. (20 points; extra credit) Do exercise 2.22.
8. (40 points; extra credit) Do exercise 2.24.
9. (40 points; extra credit) Do exercise 2.25.

References

- [1] Flemming Nielson, Hanne Riis Nielson, and Chris Hankin. *Principles of Program Analysis*. Springer-Verlag, second printing edition, 2005.