

Concepts of Programming Languages (INFOTECH)

Summer Semester 2008
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Assignment #3

Please submit your solution on Friday, July 18th 2008 in class or send it via email to staiger@informatik.uni-stuttgart.de. **Notice the new email address.** (If you want to submit earlier, please do so.) Please submit either plain text or PDF, but not MS Word files.

1 Namebinding and Method Calls

The following source code is written in an object-oriented language.

```
class T is
  ...
  method M (X : T) is begin Print ("T"); end M;
end class T;

class NT inherits T is
  ...
  method M (X : T) is begin Print ("NT"); end M; -- redefinition!
  method M2 (X : NT) is begin ... end M2;
end NT;

OT : T;
ONT : NT := new NT;
OT := new NT;
...
OT.M (OT);    -- (1)
OT.M2 (ONT);  -- (2)
ONT.M (OT);   -- (3)
ONT.M2 (ONT); -- (4)
```

a. Assume that the language uses dynamic name binding for method calls (like Smalltalk).

Are the calls at (1) to (4) legal calls? If so, which output will be produced by each call (assume that the calls are alternative implementations, so they do not influence each other)? If not, what kind of error diagnostic do you expect?

b. In the following, the language uses static name binding for method calls (like C++, Java, Eiffel).

Repeat part a. Which results are the same? Which differ? Please state the reason for the observed behaviour.

c. What are the advantages of static name binding for method calls?

General questions:

d. Explain the difference between overloading and redefinition.

- e. Explain how a method name is bound to some method declaration and how the correct body of the method is found for languages using static name binding.

2 Questions

This exercise sheet intentionally has a lot of room left for your questions – submit them in class or via email before the assignment.