

BU CAS CS 525 (SPRING SEMESTER, 2009)
COMPILER DESIGN

Assignment 6

Out: Thursday, 19 March 2009

Due: Thursday, 26 March 2009

Total: 100

Exercise 1 (group assignment) (50 points) Please implement escape analysis on local variables.

```
val escapeAnalysis: Absyn.exp -> unit
```

After calling the function `escapeAnalysis`, the escape fields of local variables should be set correctly according to the fact whether they escape or not.

Exercise 2 (group assignment) (50 points) Please implement a structure for manipulating frames. Here is a signature you may use:

```
signature FRAME =
  sig
    type access
    type frame

    datatype frag =
      PROC of {body: Tree.stm, frame: frame}
      | STRING of Temp.label * string

    val FP: Temp.temp (* frame pointer *)
    val RV: Temp.temp (* return value *)

    val newFrame: {name: Temp.label, formals: bool list} -> frame
    val name: frame -> Temp.label
    val formals: frame -> access Array.array
    val allocLocal: frame -> bool -> access

    val framOffset: access -> int
    val accessToExp: access -> Tree.exp -> Tree.exp

    val initFragList: unit -> unit
    val addFrag: frag -> unit
    val getFragList: unit -> frag list
  end
```