

## Automata Theory and Computability

### Assignment 1 (Shape Analysis)

Due on Wed 20 January 2016.

1. Consider the program below:

```
1 x = malloc();
2 y = x;
3 while (*) {
4     t = malloc();
5     y->n = t;
6     y = y->n;
7 }
8
```

Carry out on the program below

- (a) a concrete analysis (find upto 4 concrete shapes at each point).
- (b) a Strawman analysis using the predicates  $\{x, y, t, n, is, c_n, r_x, r_y, r_y\}$ .

Use the control-flow graph on the next page to fill in your answers.

2. Why we can't define the concretization (i.e. the  $\gamma$  map for the abstract analysis) to be the set of *tight* embeddings of an abstract shape?

