



## Assignment 7

### Code Transformation and Optimisation

Consider the following CiviC code fragment:

```
i = 0;
while (i < n) {
  j = 0;
  while (j < m) {
    if (i < j) {
      val = val + i;
    }
    else if (j == i) {
      val = val - 1;
    }
    else {
      val = val + j;
    }
    j = j + 1;
  }
  i = i + 1;
}
```

#### Assignment 7.1: Static Single Assignment Form

Transform the above code into Static Single Assignment Form (SSA).

#### Assignment 7.2: Machine-Independent Optimisation

Apply the loop unswitching optimisation to the (original) code above.

#### Assignment 7.3: Compilation Schemes

Devise a formal compilation scheme that systematically eliminates all occurrences of `while`-loops in the body of a CiviC function definition and replaces them by semantically equivalent code without `while`-loops.

**Assignment due date: Tuesday, January 23, 2024**