

## Exercise 8.1

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Exercise 8.1 Download `microc.zip` from the book homepage, unpack it to a folder `MicroC`, and build the micro-C compiler as explained in `README.TXT` step (B).

### 8.1 (i)

- 8.1 (i) (a)

```
compile "ex11";;
val it : Machine.instr list =
[LDARGS; CALL (1,"L1"); STOP; Label "L1"; INCSP 1; INCSP 1; INCSP 100; GETSP;
 CSTI 99; SUB; INCSP 100; GETSP; CSTI 99; SUB; INCSP 100; GETSP; CSTI 99;
 SUB; INCSP 100; GETSP; CSTI 99; SUB; GETBP; CSTI 2; ADD; CSTI 1; STI;
 INCSP -1; GOTO "L3"; Label "L2"; GETBP; CSTI 103; ADD; LDI; GETBP; CSTI 2;
 ADD; LDI; ADD; CSTI 0; STI; INCSP -1; GETBP; CSTI 2; ADD; GETBP; CSTI 2;
 ADD; LDI; CSTI 1; ADD; STI; INCSP -1; INCSP 0; Label "L3"; GETBP; CSTI 2;
 ADD; LDI; GETBP; CSTI 0; ADD; LDI; SWAP; LT; NOT; IFNZRO "L2"; GETBP;
 CSTI 2; ADD; CSTI 1; STI; INCSP -1; GOTO "L5"; Label "L4"; GETBP; CSTI 204;
 ADD; LDI; GETBP; CSTI 2; ADD; LDI; ADD; GETBP; CSTI 305; ADD; LDI; GETBP;
 CSTI 2; ADD; LDI; ADD; CSTI 0; STI; STI; INCSP -1; GETBP; CSTI 2; ADD; ...]
```

- 8.1 (i) (b)

```
java Machine ex11.out 8
....
7 5 3 1 6 8 2 4
8 2 4 1 7 5 3 6
8 2 5 3 1 7 4 6
8 3 1 6 2 5 7 4
8 4 1 3 6 2 7 5

Ran 0.059 seconds
```

### 8.1 (ii)

## Exercise 8.3

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## Exercise 8.4

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## Exercise 8.5

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Changes to `Absyn.fs`, `CLex.fsl`, `CPar.fsy` and `Comp.fs`.

## Exercise 8.6

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Changes to `Absyn.fs`, `CLex.fs1`, `CPar.fsy` and `Comp.fs`.

The compilation scheme is really messy with tonnes of duplicates on the stack, but it should work.