CSC 201 Homework 4

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Problem 1

$\{M1 \wedge A\}$ while C1 do $\{C1 \wedge A\}$ (...) $\{A \wedge C1 \wedge M2\}$

$\{C1 \wedge A\}$ if C2 then $\{C1 \wedge C2 \wedge A\}$ (...) else $\{C1 \wedge A \wedge C2\}$ L2 $\{A\}$

$\{C1 \wedge C2 \wedge A\}$ (while C3 do $\{C1 \wedge C2 \wedge A \wedge C3\}$ L1) $\{A \wedge C3\}$

Problem 2

(a) $\{i = 0 \wedge j = 0 \wedge N > 0\}$
while $i < N$ do
$\{i < N\}$
j := j + x[i];
i := i + 1;
end
$\{i \geq N\}$

(b) $\{i = N \wedge j = x[0] + x[1] + \ldots + x[N-1]\}$
$\rightarrow \{i = N \wedge j = x[0] + x[1] + \ldots + x[i-1]\}$
i := i + 1;
$\{i + 1 = N \wedge j = x[0] + x[1] + \ldots + x[i + 1 - 1]\}$
j := j + x[i];
$\{i + 1 = N \wedge j + x[i] = x[0] + x[1] + \ldots + x[i]\}$
$\rightarrow \{i \leq N \wedge j = x[0] + x[1] + \ldots x[i-1]\}$