Well Known Algorithms (CSI 30)

procedure *linear search*(x : integer; $a_1,\ldots,a_n$: distinct integers)
$i := 1$
while ($i \leq n$ and $x \neq a_i$)
    $i := i + 1$
if $i \leq n$ **then** *location* := i
else *location* := 0
{*location* is the index(subscript) of the term that equals x, or 0 if x is not found}

procedure *binary search*(x : integer; $a_1,\ldots,a_n$: increasing integers)
$i := 1$ { i is the left endpoint}
$j := n$ { j is the right endpoint}
while $i < j$
    $m := \lfloor (i+j)/2 \rfloor$
    if $x > a_m$ then $i := m+1$
    else $j := m$
if $x = a_i$ **then** *location* := i
else *location* := 0
{*location* is the index(subscript) of the term that equals x, or 0 if x is not found}

procedure *bubblesort*($a_1,\ldots,a_n$:real numbers with $n \geq 2$)
for $i := 1$ **to** $n-1$
    for $j := 1$ **to** $n-i$
        if $a_j > a_{j+1}$ **then** interchange a_j and a_{j+1}
{$a_1, a_2, \ldots, a_n$ is in increasing order}

procedure *insertionsort* ($a_1,\ldots,a_n$:real numbers with $n \geq 2$)
for $j := 2$ **to** n
    $i := 1$
    while $a_j > a_i$
        $i := i+1$
    $m := a_j$
    for $k := 0$ **to** $j-i-1$
        $a_{j-k} := a_{j-k-1}$
    $a_i := m$
{$a_1, a_2, \ldots, a_n$ is in increasing order}