```
    CONTEXT
        SortedArray TASKING CONTEXT --undefined--     ›
    EXTENDS
         Array
    AXIOMS
        axm1:   ∀i,j·i∈1‥n ∧ j∈i‥n ⟹ a(i)≤a(j) not theorem TYPING --
undefined-- ›
    END
```

```
MACHINE
    U00     ›
REFINES
     U0
SEES
     SortedArray
VARIABLES
    result   private ›
    c    private ›
INVARIANTS
    inv4:   c∈0‥n−1 not theorem TYPING --undefined-- ›
    inv5:   ∀i·i∈1‥n ∧ a(i)≥ x ⟹ i > c not theorem TYPING --undefined-- ›
    inv6:   ∀i· i∈1‥c ⟹ a(i)<x theorem TYPING --undefined-- ›
    DLF:    (a(c+1) = x ∧ (c+1 = n ∨ a(c+2)> x)) ∨
            (c=n−1 ∧ a(n)≠x) ∨
            (c+2 ≤ n ∧ a(c+1)=x ∧ a(c+2)= x) ∨
            (c+1 < n ∧ a(c+1) < x ) ∨
            (c < n ∧ a(c+1)> x) ∨
            (c=n−1 ∧ a(c+1) < x) theorem TYPING --undefined-- ›
EVENTS
    INITIALISATION:    extended ordinary internal --undefined-- ›
        THEN
            act1:   result≔0 ›
            act2:   c ≔ 0 ›
        END

    Success:    not extended ordinary internal --undefined-- ›
        REFINES
             Success
        WHERE
            grd2:   a(c+1)=x not theorem TYPING --undefined-- ›
            grd3:   c+1=n ∨ a(c+2)>x not theorem TYPING --undefined-- ›
        WITH
            i:  i=c+1 ›
        THEN
            act1:   result ≔ c+1 ›
        END

    Failure0:   not extended ordinary internal --undefined-- ›
        REFINES
             Failure0
        WHERE
            grd1:   c=n −1∧ a(n)≠ x not theorem TYPING --undefined-- ›
        END

    Failure2:   not extended ordinary internal --undefined-- ›
        REFINES
             Failure2
        WHERE
            grd6:   c+2 ≤ n not theorem TYPING --undefined-- ›
            grd7:   a(c+1) = x not theorem TYPING --undefined-- ›
            grd8:   a(c+2)=x not theorem TYPING --undefined-- ›
        WITH
            i:  i=c+1 ›
```

```
            j:  j = c+2 ›
        END

    Forward:    not extended ordinary internal --undefined-- ›
        WHERE
            grd1:   c+1<n not theorem TYPING --undefined-- ›
            grd3:   a(c+1)<x not theorem TYPING --undefined-- ›
        THEN
            act1:   c≔c+1 ›
        END

    Failure00:  not extended ordinary internal --undefined-- ›
        REFINES
             Failure0
        WHERE
            grd1:   c<n not theorem TYPING --undefined-- ›
            grd2:   a(c+1)>x not theorem TYPING --undefined-- ›
        END

END
```