Consider the following algorithm.

```
1: function MYSTERY(A,s,f)
2:     # A is a list and s,f are indices such that 0 ≤ s ≤ f + 1 ≤ length(A)
3:     if s > f then
4:         return 0
5:     end if
6:     m = ⌊(f−s+1)/4⌋
7:     res = Mystery(A, s, s + m − 1)
8:     # loop precondition goes here...
9:     for i = s + m, ··· , f − m do
10:        res = res + A[i]
11:    end for
12:    # loop postcondition goes here...
13:    res = res + Mystery(A, f − m + 1, f)
14:    return res
15: end function
```

**1.** State clear and precise preconditions for this algorithm.

**2.** State clear and precise postconditions for this algorithm.

**3.** Prove the correctness of this algorithm.

Note: You may assume that the loop is correct without proof, as long as you state clear preconditions and postconditions specifically for the loop where indicated by comments.