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 = \lfloor \frac{f - s + 1}{4} \rfloor`
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.