Mini Homework 3

This is a D&C algorithm. In terms of the recursion tree:

- The number of levels: The `f` is recursively called until `l>r` . The number of levels is exactly $\lg N$ since the range of `r-l` is halved for each level downward.
- The amount of work at each level: The amount of work is independent of l and r. The `for` loop at line 5 goes from `bl` to `br` and randomly assigns a value to `bmid` as a cut point. However, the loops at the same level, altogether, essentially loops through $[1, M]$ exactly one. Therefore, the amount of work at each level is exactly M.

To sum up, the time complexity is the number of levels $\times$ the amount of work at each level $= M \lg N$