Recall the function \texttt{partition} which is used in quicksort:

\begin{verbatim}
partition(A, p, r):
    x = A[r]
    i = p - 1
    for j = p .. r - 1 do:
        if A[j] <= x:
            i = i + 1
            exchange A[i] and A[j]
    exchange A[i + 1] and A[r]
    return i + 1
\end{verbatim}

State correct pre- and postconditions for this function. Then, prove that this function is correct, using a suitable loop invariant. Don’t forget about termination!