7.1-3.

Give a brief argument that the running time of PARTITION on a subarray of size n is $\Theta(n)$.

Answer.

All the other operations of PARTITION takes a constant time, except the **for** loop in lines 3–6 generates $r - p = \Theta(n)$ iterations, and the **if** conditional inside takes only a constant amount of operations upon it. Therefore, the running time of PARTITION on a subarray of size n is $\Theta(n)$.

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