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Pre-lecture exercises will not be collected for credit. However, you will get more out of each lecture if you do them, and they will be referenced during lecture. We recommend **writing out** your answers to pre-lecture exercises before class. Pre-lecture exercises usually should not take you more than 30 minutes.

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Suppose that you are sorting people in CS161 (say  $n$  students) based on what month they were born in. So, if Plucky and Lucky were both born in January, Siggi was born in April, and Ollie was born in May, then it would be fine to return either  $\{\text{Plucky, Lucky, Siggi, Ollie}\}$  or  $\{\text{Lucky, Plucky, Siggi, Ollie}\}$ . In the above example, your input would be a list of the form

[ (Plucky, 1), (Lucky, 1) , (Siggi, 4), (Ollie, 5) ]

(Here the 1 is for January, which is the first month, and so on).

1. How would you do this using MergeSort? How long would it take (as a function of  $n$ )?
2. Can you think of a way to do it faster? [Hint, there is a way to do it faster.]