CS 170 Efficient Algorithms and Intractable Problems

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HW 2

Due February 1, 11:59pm

1. (15 pts.) Complex Numbers Review

- (i) (a) $2\left(\cos\frac{5\pi}{6} + i\sin\frac{5\pi}{6}\right) = -\sqrt{3} + \frac{i}{2}$. (b) $1, \cos\frac{2\pi}{3} + i\sin\frac{2\pi}{3} = -\frac{1}{2} + i\frac{\sqrt{3}}{2}, -\frac{1}{2} - i\frac{\sqrt{3}}{2}$.
 - (c) 0.
- (ii) As $\sqrt{-1} = \pm i \implies \sqrt{\sqrt{-1}} = \pm \sqrt{\pm i} = \pm \sqrt{i}$ and $\pm \sqrt{-i}$. The first is not simplfiable. The second is simply $\pm i\sqrt{i}$ which is a linearly independent from the first. Therefore there are a total of 4 values that this takes on.
- (iii) Yes, it is just $7 \cdot -2 = -14$.

2. (15 pts.) Two Sort Lists