

$$\begin{aligned}
O(|V| + |V| \log |V| + |V| \log |V| + |E| \log |V|) \\
= O(|V| + |V| \log |V| + |E| \log |V|) \\
= O\left((|V| + |E|) \cdot \log |V|\right)
\end{aligned}$$