Instructions. This activity will be completed in groups.

- Self-organize into groups of 4 or 5.
- Find an available spot on the board.
- Work together on solving the questions in the order they appear on the sheet.
- Make sure that someone is ready to discuss these answers.

Let $G = (V, E)$ be a connected undirected graph, and $c$ be costs associated with each edge, $c(e) > 0$. Consider the algorithms below and answer the questions

(a) What is AlgorithmA computing?

(b) What is AlgorithmB computing?

(c) Can you establish any relationship between them?

1: \textbf{AlgorithmA}(G, c, s)
2: $S \leftarrow \{s\}$
3: $T \leftarrow \emptyset$
4: \textbf{while} $S \neq V$ \textbf{do}
5: \hspace{1em} Select a node $v \not\in S$ with min$_{e=(u,v):u \in S} c(e)$ as small as possible
6: \hspace{1em} Add $v$ to $S$
7: \hspace{1em} Add $e$ to $T$
8: \textbf{end while}
9: \textbf{return} $T$

1: \textbf{AlgorithmB}(G, c)
2: Sort edges by increasing order of their cost $c(e_1) \leq c(e_2) \leq \ldots c(e_m)$
3: $T \leftarrow \emptyset$
4: $i \leftarrow 1$
5: \textbf{while} $|T| < n - 1$ \textbf{do}
6: \hspace{1em} if $T \cup e_i$ does not contain a cycle then
7: \hspace{2em} $T \leftarrow T \cup e_i$
8: \hspace{2em} $i \leftarrow i + 1$
9: \hspace{1em} else
10: \hspace{2em} $i \leftarrow i + 1$
11: \hspace{1em} \textbf{end if}
12: \textbf{end while}
13: \textbf{return} $T$