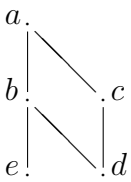
MS121 Tutorial 6

1. If $A = \{a, b, c, d, e\}$ and R is the partial order on A whose Hasse diagram is



write R as a set of ordered pairs.

2. Order the elements of A from Q1 in such a way that the matrix of R has no Ts below the diagonal.

3. Order the following binary strings lexicographically using $0 < 1$ as the total order on $\{0, 1\}$ and letting an end-of-string character precede 0.

$$101, 010101, 101010, 1, 0100, 01, \text{empty string}.$$

4. Let R and S be the relations on $A = \{1, 2, 3, 4, 5\}$ given by

$$R = \{(1, 2), (2, 3), (3, 4), (4, 5)\}.$$

$$S = \{(2, 3), (2, 4), (3, 4)\}.$$

Compute $R^2 = R \circ R$ and $S^2 = S \circ S$. Check that $S^2 \subset S$ while $R^2 \not\subseteq R$. Show that R is not transitive.