

## Solution to Problem 18

**Problem.** Suppose that  $A, B$  are r.e. sets. If a number  $n$  appears in the  $A$ -generating algorithm at moment 3, when will this number appear in the algorithm generating all elements of the union  $A \cup B$ ?

**Solution.** According to the posted lecture, if the  $A$ -generating algorithm generates a number at moment  $k$ , then the union-generating algorithm generates this number at moment  $2k - 1$ .

In this problem,  $k = 3$ , so the union-generating algorithm generates the number  $n$  at moment  $2 \cdot 3 - 1 = 5$ .