

Solution to Problem 19

Problem. Suppose that A, B are r.e. sets. If a number n appears in the A -generating algorithm at moment 2 and in the B -generating algorithm at moment 4, when will this number appear in the algorithm generating all elements of the intersection of A and B ?

Solution. According to the lecture, if a number was generated by the A -generating algorithm at time k and by the B -generating algorithm at time ℓ , then it is produced by the intersection-generating algorithm by the time $\max(2k - 1, 2\ell)$.

In this problem, $k = 2$ and $\ell = 4$, so the number n will be produced by the intersection-generating algorithm by the time $\max(2 \cdot 2 - 1, 2 \cdot 4) = \max(3, 8) = 8$.