

12. $T_7 = \{ (s_0s_1s_2 \dots) \mid \text{no two consecutive } s_j = 0 \}$.

In words, T_7 consists of those strings in which every 0 is followed by a 1. The complement of this set consists of all strings with a consecutive pair of 0s. The string $(00\bar{1})$ is one such example. Unfortunately, there is no string in T_7 close to this string—in fact, the element in T_7 closest to $(00\bar{1})$ is $(0\bar{1})$, and $d[(00\bar{1}), (0\bar{1})] = 1/2$. Therefore, T_7 is not dense.

13. T_8 is the complement of T_7 .

The complement of T_7 is dense in Σ . As mentioned in Exercise 12, T_8 is the set of strings containing a consecutive pair of 0s. Now take any point in Σ and construct a sequence in T_8 converging to it. (The sequence in Exercise 8 will serve this purpose just fine.)