MP3Player:

- Plenty of slow correct solutions, starting with „for each T, try all V_1“, which can then be improved by restricting „all T“ to reasonable values of T only.
- For a fixed T, the function that returns V_2 for a given V_1 is non-decreasing, hence we can use binary search to check whether a valid V_1 exists.
- For any segment of keypresses the above function has the form: for V_1 from 0 to A-1 the function is constant, for V_1 from A to B-1 it increases by 1, and then from B to V_max it is constant again. If we have two segments for which we know their functions and concatenate them, the new function for the longer segment can be computed in O(1).
- There are several solutions with slightly different time complexities that score 100 points. One of them is based on the following idea: Use an interval tree to represent the current function for segments of the input. Start at T=infinity, then decrease T, update the functions of 1-key segments for keys that become activated, and each time update the function computed by the entire sequence. Stop as soon as this function can produce the output value V_2. The time complexity of this approach is O(N log N).