# BWT Conversion

**Solution**

The given RLE-BWT (e.g., 1p2s1m1i1p1i2s2i) can be first decompressed into BWT (e.g., pssmipissii). In order to obtain the original text, note that the BWT text was constructed by sorting all the rotations of original text. Therefore, the BWT text can be first sorted (i.e., iiiimppsss) and appended with the unsorted BWT text (i.e., pssmipissii), which reconstruct the prefixes (with length two) of all rotations (i.e., im, ip, is, is, …). By recursively repeating this sorting and appending process, the rotation matrix from original text can be reconstructed. Given the extra index of original text in the sorted rotation matrix (e.g., 5), we can obtain the original text (i.e., mississippi). Subsequently, given the reverse sequence of original text (i.e., ippississim), repeat the BWT construction process by sorting all rotations of the reverse text, we can obtain the reverse BWT in the last column of the rotation matrix (i.e., smspipiissii). Finally, output the RLE of the reverse BWT (i.e., 1s1m1s1p1i1p1i2s2i).