Question #1 [scores 6]. Construct a minimal ordered perfect hash for a set of 5 strings \{aba, abb, baa, bab, bbb\} by assuming hash functions
\[ h_1(s) = s[1] + 3 \times s[2] + 5 \times s[3] \mod 11 \]
and
\[ h_2(s) = (s[1]+s[2]) \times 3 + s[3] \mod 11 \] (hence m=11),
where \( s[i] \) is the i-th character of string \( s \) represented as a=2 and b=3.

Question #2 [scores 5+5]. Given the string \( S = abarabba \), compute its
- parsing LZSS (namely the one that emits \textit{pairs})
- parsing LZW, where you can assume the code for a=1, b=2, r=3

Question #3 [scores 4+4]. Given the sequence of integers \( S=(1, 6, 15, 18, 21, 24, 30) \), encode each of them using:
- Rice code with \( k=3 \) by do not applying gap-coding before.
- Elias-Fano encoding.

Question #4 [scores 4+2]
- Show the Suffix Array of the string \( S = abababc \)
- Show the first two steps of using it to search for the string “bb” into \( S \).