(1) *Frequency Estimation Algorithms Implementation [6 marks]:*
   - Implement the following frequency estimation algorithms:
     - **Classic Mode** (each time a new element arrives):
       - Misra-Gries algorithm
       - Space-Saving algorithm
     - **Both Classic and Turnstile Mode** (as detailed in Lec 3 slides):
       - Count-Min Sketch
       - Count-Sketch
   - Compare their performance in terms of relative error for each mode.

(2) *Range-based Frequency Estimation [6 marks]:*
   - Implement the range-based frequency estimation framework using the dyadic tree for all four methods. Compare their performance in terms of relative error under different ranges under each mode.

(3) *Report on Experimental Results [5 marks]:*
   - Document your findings in a comprehensive report that:
     - Presents the experimental results.
     - Summarizes the advantages and disadvantages of each method.

(4) *Advanced Solution Design [3 marks]:*
   - Propose and design an enhanced solution that outperforms the previously learned methods in terms of achieving a smaller error in frequency estimation.