Problem 1. Illustrate the operation of Radix sort on the following list of words:

plan, etaa, cana, meri, peri

Then concatenate the words in the order: 4, 5, 2, 3, 1, i.e., the fourth word of the sorted output followed by the fifth word, and, so on. You will get a twenty letter word. Now split that twenty letter word into two words, one including the first eleven letters and the second one containing nine letters. These two words is a scientific name for something. What is it? Now search for the two words followed by ‘AI maximizing algorithm’ in Google. In the search results look for the result from Google books (it should be the first result). It should lead you to a page from the book whose title initials are Y,L,L,A,T,A,I,L,Y. Read that page. Write in a sentence or two what the page from the book is talking about.

Problem 2. Is bubble sort stable? Why or why not?

Problem 3. The closest-pair problem can be posed in \( m \)-dimensional space in which the Euclidean distance between two points \( P' = (x'_1, \ldots, x'_m) \) and \( P'' = (x''_1, \ldots, x''_m) \) is defined as

\[
d(P', P'') = \sqrt{\sum_{s=1}^{m} (x'_s - x''_s)^2}
\]

Find the runtime for the brute-force algorithm to find the closest pair in \( m \)-dimensional space? Pseudocode is not necessary, just the exact runtime. You should find the total work for pairwise distance over all dimensions. The work for each dimension is constant.