PROBLEM INTRODUCTION:

Radix Sort is a sorting algorithm performed on numbers using their digits starting from the least significant digit. Radix sort uses Counting sort to sort the elements.

ALGORITHM STEPS:

REQUIRED INPUTS: An unsorted array of integers within a certain range.

OUTPUT: The sorted array of given elements

CORE STRATEGY:

The Radix sort sorts the elements in linear time by removing the comparisons between elements. It uses the counting sort to maintain count and sort the elements based on each radix.

STEPS:

1. Take the unsorted array as input.
2. Compute the maximum of given elements.
3. Obtain the number of digits present in the maximum element which gives the maximum number of radices,i.e, maximum digit count.
4. Obtain the next least significant digits from the elements of the input array and store them in respective indices of the temporary array of size equal to that of the input array.
5. Perform the counting sort on the temporary array. Using the cumulative count obtained in counting sort of temporary array, insert the elements of the input array into the respective places of the output array.
6. Repeat steps 4, 5, and 6 for maximum digit count times.
7. The resultant output array will give the sorted order of elements.

TIME AND SPACE COMPLEXITY: The radix sort takes the linear time i.e, For sorting n elements with the maximum element as k and maximum digit count d, it takes the time of O(d(n+k)).