3500 INDIVIDUAL PROJECT ON BUCKET SORT

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What is needed for project:

* Code
  + in visual studios and it works well
* Explanation of algorithm
  + Bucket sort is an out of place sorting algorithm, this means that it will create a new array to put the output in and not simply change the input array to be sorted. (Bubble, merge, ect are in place)
  + The implementation of bucket sort I have used for this project finds the maximum value element in the array and then makes buckets for integer values 0 to the max value.
  + These buckets are simply a numerical value which after iterating through the original array will be equal to the amount of times a number appears in an array.
  + Then it goes through the array and increases the bucket for each element it encounters.
  + After finishing going through the input array the algorithm will iterate through the buckets and write the number they represent to a new output array the number of times the bucket says to.
  + This ends up sorting the array out of place with a run time equal to:
    - The biggest element value in the input array \* the largest bucket size + the length of the input array or M\*K+N
* Runtime of algorithm
  + Line by line description:
  + N is length of input list
  + M is biggest element in input list
  + K is size of biggest bucket
    - N
    - 1
    - M
      * 1
    - N
      * 1
    - M
      * K
        + 1
        + 1
        + 1
  + Final time is M\*K+N
    - Biggest element in the input list \* the size of the biggest bucket + the length of the input list

How to present:

* Video on phone with simple piece of paper and marker visualization