HARAMAYA UNIVERSITY

Data Structure and Algorithms

Group Assignment

Department : Software Engineering

No		Id
1.	Abel Melaku Buzye	859/13
2.	Abigiya Alemayehu Adugna	862/13
3.	Habtamu Wolde Hadego	887/13
4.	Lidiya Alemayehu Adugna	894/13
5.	Yonatan Afewerk Teshome	917/13

```
# Version 1
#include <iostream>
#include <algorithm>
#include <vector>

/* Bucket Sort */

using namespace std;

/* Function to sort arr[] of size n */
void bucketSort(float arr[], int n){

        // Create n empty buckets
        vector<float> buckets[n];

        // Put array elements in different buckets
        for (int i = 0; i < n; i++){
        int buck = n * arr[i]; // Index in bucket
                buckets[buck].push_back(arr[i]); // Add data to the end of the %vector.
        }

        // Sort individual buckets
        for (int i = 0; i < n; i++)
                sort(buckets[i].begin(), buckets[i].end()); //Returns a read/write iterator

        // concatenate all buckets int arr[]
        int index = 0;
        for (int i = 0; i < n; i++)
                // Returns the number of elements in the %vector.
                for (int j = 0; j < buckets[i].size(); j++)
                        arr[index++] = buckets[i][j];
}
```

```
/* Driver */
int main(){
	float arr[] = { 0.8, 0.5, 0.6, 0.1, 0.9, 0.3, 0.2, 0.4, 0.7 };
	int size = sizeof(arr) / sizeof(arr[0]);

	cout << "Unsorted Array -: ";
	for (int i = 0; i < size; i++)
	cout << arr[i] << " ";

	cout << endl;
	cout << endl;

	/* Function Call */
	bucketSort(arr,size);

	cout << "Sorted Array -: ";
	for (int i = 0; i < size; i++)
	cout << arr[i] << " ";

	cout << endl;

	return 0;
}
```

 # Version 2

```
#include <iostream>

/* Bucket Sort Version 2 */

using namespace std;

int findMax(int arr[], int n)
{
	int i, max=arr[0], cnt = 0;
	for(i = 1; I < n; i++){
		if(arr[i] > max)
		max=arr[i];
	}
	while(max > 0){
		cnt++;
		max = max / 10;
	}
	return cnt;
}

void bucketSort(int arr[],int *bucket[], int n)
{
	static int I, j[10], k, l , d=1;
	int c;
	c = findMax(arr,n);
	for(int m = 0; m < c; m++){
		for(i = 0; I < 10; i++)
			j[i]=0;
		for(i = 0; i < n; i++){
			k=(arr[i] / d) % 10;
			bucket[k][j[k]]=arr[i];
			j[k]++;
		}
		l=0;
		for( I = 0;i < 10; i++){
			for(k=0;k<j[i];k++){
				arr[l]=bucket[i][k];
				l++;
			}
		}
		d*=10;
	}
}
```

```
/* Driver */
int main(){
        int n,*arr,i;
        int *bucket[10];

        /* Get input from user and add them to the Array*/
        cout<<"Enter no of element : ";
        cin>>n;
        arr=new int[n+1];
        for(i = 0; I < 10; i++)
                bucket[i]= new int[n];
        cout<<"Enter array element : \n";

        for(i = 0; I < n; i++)
                cin>>arr[i];

        bucketSort(arr,bucket,n);

        cout<<"Sorted array : ";
        for(i = 0 ; i < n ; i++)
                cout<<arr[i]<<" ";
        cout << endl;
        return 0;
}
```