323.25 Exam1 Q1: Bucket Sort

Student: Jingshi Liu

Due Date: 3/17/2022

Source Code:

```
//
//  main.cpp
//  Exam1_coding
//
//  Created by Jingshi Liu on 3/17/22.
//

#include <iostream>
#include <fstream>
using namespace std;

class BucketSort{
public:
    int* array;
    int maxInt;
    int data;
    BucketSort(int maxNum){
        maxInt = maxNum;
        array = new int[maxInt+1];
        for(int i = 0; i < maxInt+1; i++)
            array[i] = 0;
    }

    static int findLargest(ifstream& inFile){
        int data, maxInt = 0;
        while(inFile >> data){
            if(data > maxInt)
                maxInt = data;
        }
        return maxInt;
    }

    void printBucket(ofstream& outFile, int index){
        for(int i = 0; i < array[index]; i++){
            outFile << index << " ";
        }
    }
```

```
};



int main(int argc, const char * argv[]) {
    ifstream inFile;
    ofstream outFile;
    inFile.open(argv[1]);
    outFile.open(argv[2]);

    int maxInt = BucketSort::findLargest(inFile);

    BucketSort *bucketSort = new BucketSort(maxInt);

    inFile.close();
    inFile.open(argv[1]);

    int data;
    while(inFile >> data){
        bucketSort->array[data]++;
    }

    for(int index = 0; index <= bucketSort->maxInt; index++){
        if(bucketSort->array[index] > 0){
            bucketSort->printBucket(outFile, index);
        }
    }

    inFile.close();
    outFile.close();

    return 0;
}
```

OutFile:

702 702 703 707 707 708 710 711 712 712 715 718 719 788 799 802 804 812 813 813
815 816 816 816 818 820 823 824 825 826 827 829 831 832 833 834 835 837 838 838
861 888 891 895 905 913 914 915 922 930 973