Experiment no. 6

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Title: Find 5 no. summary of a dataset.

Code:

```
#include <iostream>
#include <fstream>
#include <sstream>
#include <vector>
#include <algorithm>

using namespace std;

// Function to calculate the median of a vector
float calculateMedian(vector<int> a)
{
   int size = a.size();
   if (size % 2 == 1)
      return a[size / 2];
   else
      return (a[(size / 2) - 1] + a[size / 2]) / 2.0;
}

// Function to calculate the first quartile (Q1)
```

```
float calculateQuartile1(vector<int> v)
{
   int n = v.size();
   vector<int> first;

   for (int i = 0; i < n / 2; i++)
   {
      first.push_back(v[i]);
   }
   return calculateMedian(first);
}

// Function to calculate the third quartile (Q3)
float calculateQuartile3(vector<int> v)
{
   int n = v.size();
   vector<int> last;
   if (n % 2 == 0)
   {
      for (int i = n / 2; i < n; i++)
      {
         last.push_back(v[i]);
      }
   }
   else
```

```
    {
        for (int i = n / 2 + 1; i < n; i++)
        {
            last.push_back(v[i]);
        }
    }
    return calculateMedian(last);
}

int main()
{
    ifstream in("five_number_input.csv");
    if (!in.is_open())
    {
        cout << "Error: Unable to open the input file." << endl;
        exit(0);
    }

    ofstream out("five_number_output.csv");

    int i = 0;
    string line, mark;
    vector<int> arr;

    // Read data from the input file
```

```
while (getline(in, line))
{
   if (i == 0)
   {
      i++;
      continue;
   }
   stringstream str(line);

   getline(str, mark, ',');
   int x = stoi(mark);
   arr.push_back(x);
}

int n = arr.size();
sort(arr.begin(), arr.end());

// Write results to the output file and console
out << "Minimum value: "
   << "," << arr[0] << "\n";
out << "First Quartile (Q1) value: "
   << "," << calculateQuartile1(arr) << "\n";
out << "Median value: "
   << "," << calculateMedian(arr) << "\n";
out << "Third Quartile (Q3) value: "
```

```
        << "," << calculateQuartile3(arr) << "\n";
    out << "Maximum value: "
        << "," << arr[n - 1] << "\n";

    cout << "The minimum value is " << arr[0] << endl;
    cout << "The First Quartile (Q1) is " << calculateQuartile1(arr) << endl;
    cout << "The median is " << calculateMedian(arr) << endl;
    cout << "The Third Quartile (Q3) is " << calculateQuartile3(arr) << endl;
    cout << "The maximum value is " << arr[n - 1] << endl;

    return 0;
}
```

Result:

Input:

	A	B	C
1	Marks		
2	2		
3	4		
4	5		
5	8		
6	10		
7	9		
8	1		
9	1		
10	3		
11	6		
12	6		
13	7		

Output:

	A	B	C
1	Minimum value:	1	
2	First Quartile (Q1) value:	2.5	
3	Median value:	5.5	
4	Third Quartile (Q3) value:	7.5	
5	Maximum value:	10	
6			
7			
8			

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