

Case Study Revisited - Student Grades Program Code

Includes

```
#include <iostream>
```

```
#include <vector>
```

```
#include <algorithm>
```

```
#include <fstream>
```

```
#include <string>
```

```
#include <sstream>
```

```
using namespace std;
```

read_input (File)

```
vector<int> read_input() {  
    vector<int> grades;  
    int grade{0}; // Variable to hold input grade  
    ifstream student_file("student.dat");  
    string line;  
    while (getline(student_file, line)) {  
        istringstream is(line);  
        int grade;  
        while(is >> grade)  
            grades.push_back(grade); // Add grade to vector  
    }  
    return grades;  
}
```

read_input (console)

```
vector<int> read_input() {  
    vector<int> grades;  
    int grade{0};                                // Variable to hold input grade  
  
    cout << "Please enter the grades (-1 to finish):\n";  
  
    while(cin >> grade && grade >= 0) {          // Read in grades  
        grades.push_back(grade);                // Add grade to vector  
    }  
  
    return grades;  
}
```

display_grades 1/2

```
// Display the grades, 10 per row, separated by commas
double display_grades(const vector<int>& grades) {
    size_t output_count{0};
    double sum{0.0};                                // Variable to hold running total

    for(auto grade: grades) {
        cout << grade;
        ++output_count;

        if(output_count % 10 == 0) {
            cout << endl;
        }
    }
}
```

```
        else if(output_count != grades.size()) {  
            cout << ",";  
        }  
        else {  
            cout << "\n";  
        }  
  
        sum += grade;                // Add this grade to the running total  
    }  
    return sum;  
}
```

main()

```
vector<int> grades; // Define vector to store grades
grades = read_input();
size_t count = grades.size();
if(count == 0) {
    cout << "No valid grades entered\n";
}
else {
    cout << count << " grades entered:\n";
    sort(grades.begin(),grades.end());
    double sum = display_grades(grades);
    cout << "\nAverage grade is " << sum/count << endl;
}
```