

C++ Programming Sample Assignment

```
#include <iostream>
#include <string>
#include <vector>
#include <iomanip>
#include <cctype>

using namespace std;

struct customer {
    string name;
    double litres;
    char type;
};

// get the full name of the type of gas
string type(char t) {
    if (t == 'R')
        return "Regular";
    if (t == 'D')
        return "Diesel";
    return "Propane";
}

// get the price for the type of gas
double price(char t) {
    if (t == 'R')
        return 1.28;
    if (t == 'D')
        return 1.08;
    return 2.50;
}

int main() {
    vector<customer> customers; // save all customers
    customer c;

    while (true) {
        cout << "Enter customer's name (or ctrl Z to end) ";
        if (!getline(cin, c.name)) {
            break;
        }
        // read the number of litres and type of gasoline
        cout << "Enter number of litres ";
        cin >> c.litres;
        cout << "Enter type of gasoline (R)egular, (D)iesel or (P)ropane: ";
        cin >> c.type;
        c.type = toupper(c.type);
        cin.ignore(1024, '\n');

        // make sure the entered value is valid
        if (c.litres < 0 || c.litres > 100) {
            cout << "The number of litres must be 0-100." << endl;
        }
    }
}
```

```
        continue;
    }
    if (c.type != 'R' && c.type != 'D' && c.type != 'P') {
        cout << "The type of gasoline must be R, D or P." << endl;
        continue;
    }

    customers.push_back(c);
}
cout << endl;

// generate the report
cout << setw(20) << left << "Customer Name"
    << setw(16) << left << "Type of Gasoline"
    << setw(15) << right << "Price/Litre"
    << setw(15) << right << "# of Litres"
    << setw(15) << right << "Sales Amount"
    << endl << endl;
double total = 0;
for (int i = 0; i < customers.size(); i++) {
    c = customers[i];
    double value = price(c.type) * c.litres;
    cout << setw(20) << left << c.name
        << setw(16) << left << type(c.type)
        << setw(15) << right << setprecision(2) << fixed << price(c.type)
        << setw(15) << right << setprecision(1) << fixed << c.litres
        << setw(15) << right << setprecision(2) << fixed << value
        << endl;
    total += value;
}

// calculate average sales
double average = 0;
if (customers.size() > 0) {
    average = total / customers.size();
}

cout << endl
    << "Total sales" << setw(70) << right << setprecision(2) << fixed << total << endl
    << "Average sales" << setw(68) << right << setprecision(2) << fixed << average
<< endl;

return 0;
}
```