

**A**  
**Project Report**  
**on**  
**“WATER SUPPLY MANAGEMENT SYSTEM”**

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**SUBJECT**  
**C++**  
**PROGRAMMING**  
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# INTRODUCTION

## *Water Supply Management Systems*

This management system covers essential operations like managing customers, tracking water consumption, and billing based on usage. Also you can extend this based on specific needs like adding a GUI, integrating databases, or adding more features.

# CODE

```
#include <iostream>
#include <vector>
#include <string>
#include <iomanip>
using namespace std;
struct Customer {
    int id;
    string name;
double waterUsage;
};
{
private:
    vector<Customer> customers;   double ratePerLiter;
public:
    WaterSupplyManagement(double rate) : ratePerLiter(rate) {}
    void addCustomer(int id, const string& name)
{
    customers.push_back({ id, name, 0 });
    cout << "Customer " << name << " added successfully.\n";   }
    void recordWaterUsage(int id, double usage) {
        for (auto& customer : customers) {
            if (customer.id == id) {
                customer.waterUsage += usage;
                cout << "Water usage recorded for customer " << customer.name << ".\n";
                return;
            }
        }
    }
}
```

```

    }
    }
    cout << "Customer not found.\n";
}
void generateBill(int id)
{
    for (const auto& customer : customers)
    {
        if (customer.id == id) {
            double billAmount = customer.waterUsage * ratePerLiter;
            cout << fixed << setprecision(2);
            cout << "Bill for " << customer.name << ":\n";
            cout << "Water Usage: " << customer.waterUsage << " liters\n";
            cout << "Total Amount: $" << billAmount << "\n";
            return;
        }
    }
    cout << "Customer not found.\n";
}

void displayCustomers() const
{
    cout << fixed << setprecision(2);
    cout << "Customer List:\n";
    for (const auto& customer : customers) {
        cout << "ID: " << customer.id << ", Name: " << customer.name
            << ", Water Usage: " << customer.waterUsage << " liters\n";
    }
}
};

int main() {
    double ratePerLiter;
    cout << "Enter rate per liter: ";
    cin >> ratePerLiter;
    WaterSupplyManagement system(ratePerLiter);
    int choice;
    do {
        cout << "\n--- Water Supply Management System ---\n";
        cout << "1. Add Customer\n";
        cout << "2. Record Water Usage\n";
        cout << "3. Generate Bill\n";
        cout << "4. Display All Customers\n";
        cout << "5. Exit\n";    cout << "Enter your choice: ";
        cin >> choice;
        switch (choice) {
            case 1: {
                int id;
                string name;

```

```
cout << "Enter customer ID: ";
    cin >> id;
    cout << "Enter customer name: ";
    cin.ignore();
    getline(cin, name);
    system.addCustomer(id, name);
    break;
}
case 2:
{
    int id;
    double usage;
    cout << "Enter customer ID: ";
    cin >> id;
    cout << "Enter water usage in liters: ";
    cin >> usage;
    system.recordWaterUsage(id, usage);
    break;
}
case 3:
{
    int id;
    cout << "Enter customer ID: ";
    cin >> id;
    system.generateBill(id);
    break;
}
case 4:
    system.displayCustomers();
    break;
case 5:
    cout << "Exiting system.\n";
    break;
default:
    cout << "Invalid choice. Please try again.\n";
    break;
}
}
while (choice != 5);
return 0;
}
```

# OUTPUT

```
/tmp/ReKh9U7iUa.o
```

```
Enter rate per liter: 15
```

```
--- Water Supply Management System ---
```

1. Add Customer
2. Record Water Usage
3. Generate Bill
4. Display All Customers
5. Exit

```
Enter your choice: 1
```

```
Enter customer ID: Yuvraj123
```

```
Enter customer name: Customer added successfully.
```

```
--- Water Supply Management System ---
```

1. Add Customer
2. Record Water Usage
3. Generate Bill
4. Display All Customers
5. Exit

```
Enter your choice: Enter customer ID: Enter customer name: Customer added  
successfully.
```

# CONCLUSION

The Water Supply Management System implemented in C++ provides a simple yet effective solution for managing customer records, tracking water consumption, and generating bills. This system demonstrates key concepts of C++ such as class design, data structures, input handling, and control flow using a menu-driven interface. It helps water service providers efficiently organize data and streamline operations. While this is a foundational system, it can be extended with advanced features like database connectivity, error handling, and real-time monitoring to enhance usability and scalability. Such a system plays a critical role in promoting sustainable water usage by offering transparent billing and tracking, ensuring that both service providers and customers benefit.