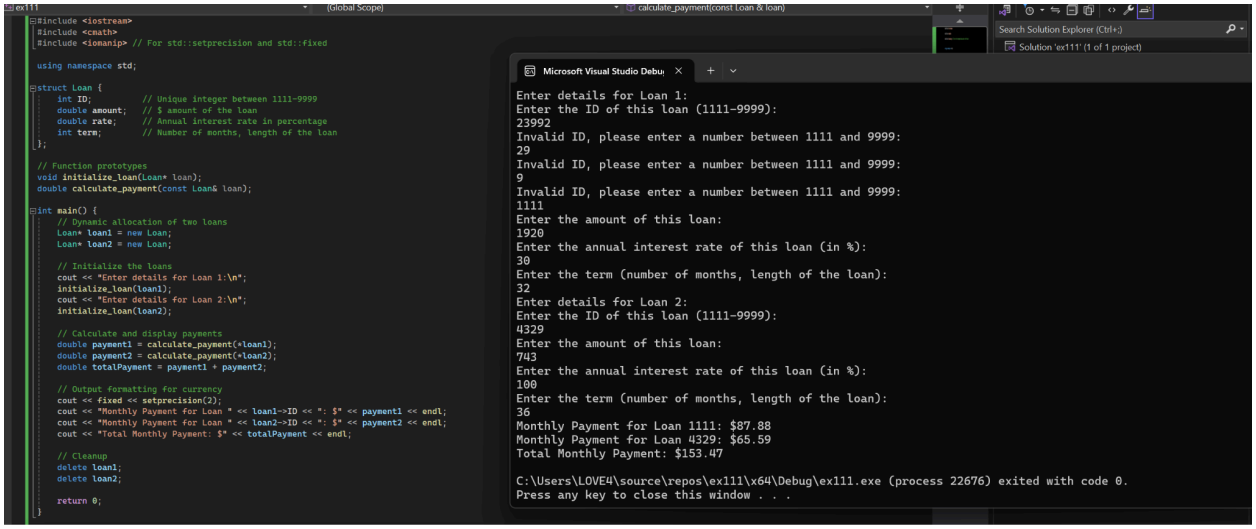
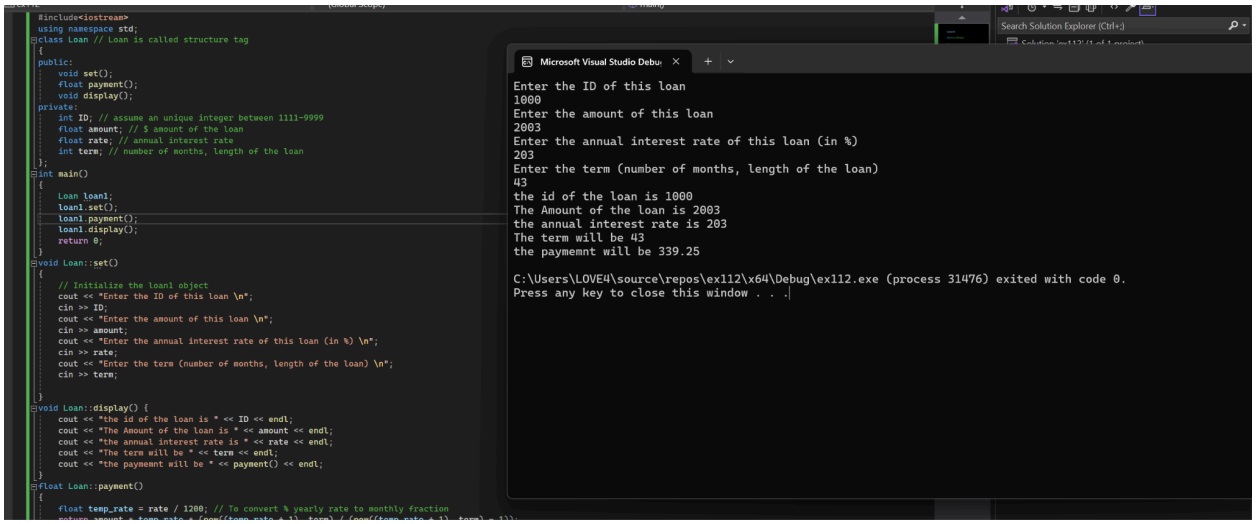
11.1



```
#include <iostream>
#include <cmath>
#include <iomanip> // For std::setprecision and std::fixed

using namespace std;

struct Loan {
    int ID;          // Unique integer between 1111-9999
    double amount;   // $ amount of the loan
    double rate;     // Annual interest rate in percentage
    int term;        // Number of months, length of the loan
};

// Function prototypes
void initialize_loan(Loan* loan);
double calculate_payment(const Loan& loan);

int main() {
    // Dynamic allocation of two loans
    Loan* loan1 = new Loan;
    Loan* loan2 = new Loan;

    // Initialize the loans
    cout << "Enter details for Loan 1:\n";
    initialize_loan(loan1);
    cout << "Enter details for Loan 2:\n";
    initialize_loan(loan2);

    // Calculate and display payments
    double payment1 = calculate_payment(*loan1);
    double payment2 = calculate_payment(*loan2);
    double totalPayment = payment1 + payment2;

    // Output formatting for currency
    cout << fixed << setprecision(2);
    cout << "Monthly Payment for Loan " << loan1->ID << ": $" << payment1 << endl;
    cout << "Monthly Payment for Loan " << loan2->ID << ": $" << payment2 << endl;
    cout << "Total Monthly Payment: $" << totalPayment << endl;

    // Cleanup
    delete loan1;
    delete loan2;

    return 0;
}
```

```
Microsoft Visual Studio Debu

Enter details for Loan 1:
Enter the ID of this loan (1111-9999):
23992
Invalid ID, please enter a number between 1111 and 9999:
29
Invalid ID, please enter a number between 1111 and 9999:
9
Invalid ID, please enter a number between 1111 and 9999:
1111
Enter the amount of this loan:
1920
Enter the annual interest rate of this loan (in %):
30
Enter the term (number of months, length of the loan):
32
Enter details for Loan 2:
Enter the ID of this loan (1111-9999):
4329
Enter the amount of this loan:
743
Enter the annual interest rate of this loan (in %):
100
Enter the term (number of months, length of the loan):
36
Monthly Payment for Loan 1111: $87.88
Monthly Payment for Loan 4329: $65.59
Total Monthly Payment: $153.47

C:\Users\LOVE4\source\repos\ex111\x64\Debug\ex111.exe (process 22676) exited with code 0.
Press any key to close this window . . .
```

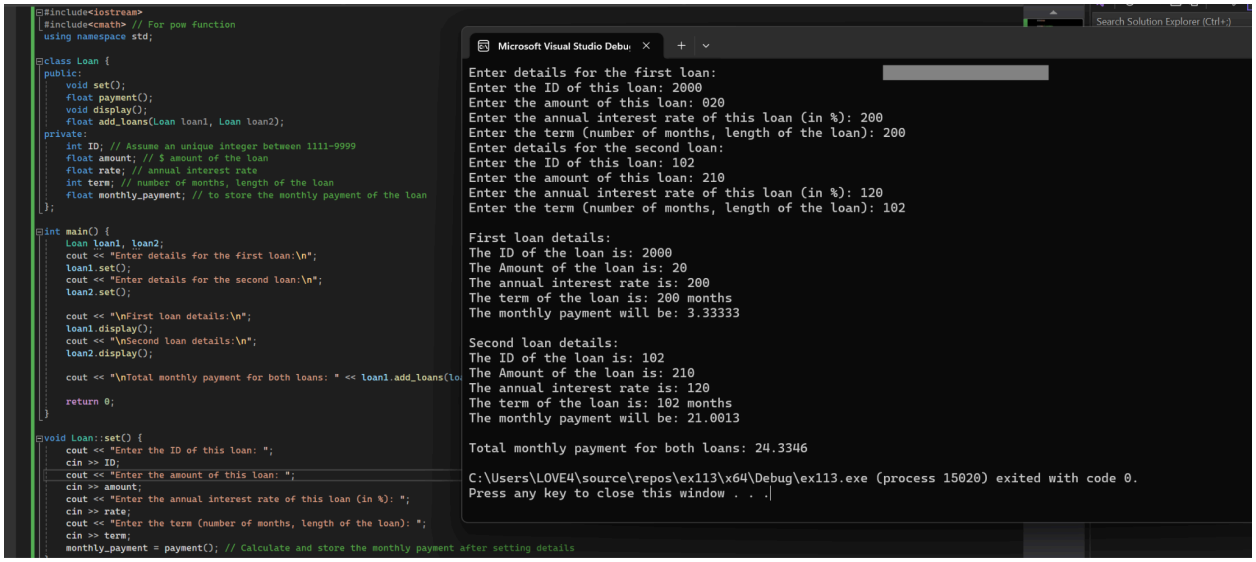
11.2



```
#include<iostream>
using namespace std;
class Loan // Loan is called structure tag
{
public:
    void set();
    float payment();
    void display();
private:
    int ID; // assume an unique integer between 1111-9999
    float amount; // $ amount of the loan
    float rate; // annual interest rate
    int term; // number of months, length of the loan
};
int main()
{
    Loan loan1;
    loan1.set();
    loan1.payment();
    loan1.display();
    return 0;
}
void Loan::set()
{
    // Initialize the loan1 object
    cout << "Enter the ID of this loan \n";
    cin >> ID;
    cout << "Enter the amount of this loan \n";
    cin >> amount;
    cout << "Enter the annual interest rate of this loan (in %) \n";
    cin >> rate;
    cout << "Enter the term (number of months, length of the loan) \n";
    cin >> term;

}
void Loan::display() {
    cout << "the id of the loan is " << ID << endl;
    cout << "The Amount of the loan is " << amount << endl;
    cout << "the annual interest rate is " << rate << endl;
    cout << "The term will be " << term << endl;
    cout << "the paymemnt will be " << payment() << endl;
}
float Loan::payment()
{
    float temp_rate = rate / 1200; // To convert % yearly rate to monthly fraction
```

```
Microsoft Visual Studio Debu

Enter the ID of this loan
1000
Enter the amount of this loan
2003
Enter the annual interest rate of this loan (in %)
203
Enter the term (number of months, length of the loan)
43
the id of the loan is 1000
The Amount of the loan is 2003
the annual interest rate is 203
The term will be 43
the paymemnt will be 339.25

C:\Users\LOVE4\source\repos\ex112\x64\Debug\ex112.exe (process 31476) exited with code 0.
Press any key to close this window . . .
```

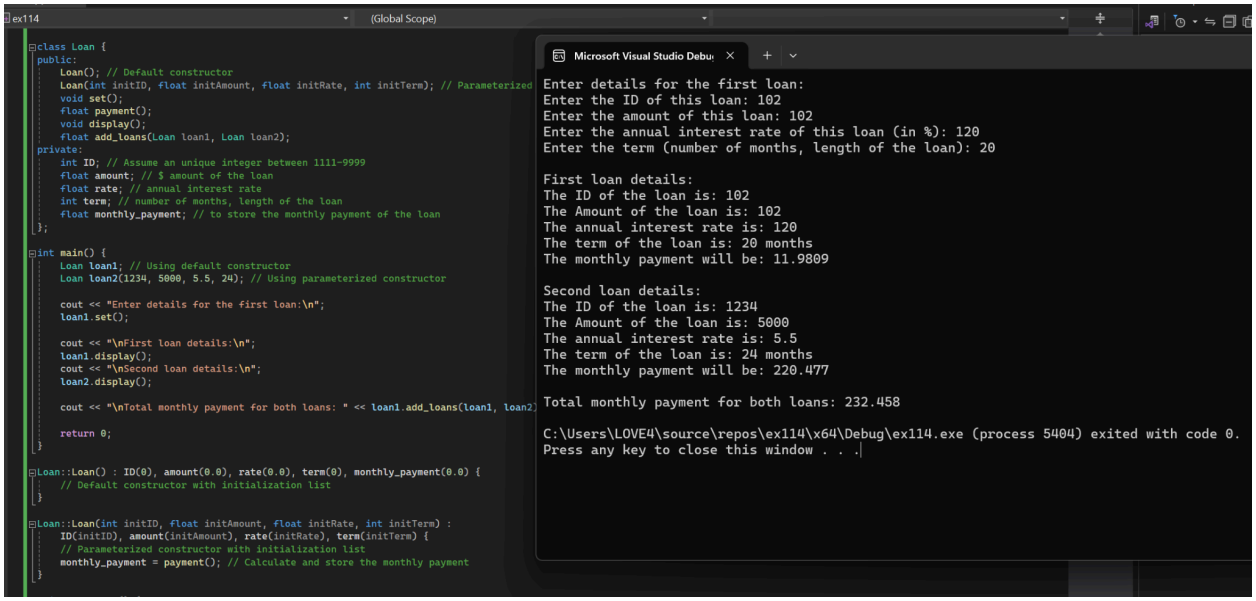
11.3



```cpp
#include<iostream>
#include<cmath> // For pow function
using namespace std;

class Loan {
public:
    void set();
    float payment();
    void display();
    float add_loans(Loan loan1, Loan loan2);
private:
    int ID; // Assume an unique integer between 1111-9999
    float amount; // $ amount of the loan
    float rate; // annual interest rate
    int term; // number of months, length of the loan
    float monthly_payment; // to store the monthly payment of the loan
};

int main() {
    Loan loan1, loan2;
    cout << "Enter details for the first loan:\n";
    loan1.set();
    cout << "Enter details for the second loan:\n";
    loan2.set();

    cout << "\nFirst loan details:\n";
    loan1.display();
    cout << "\nSecond loan details:\n";
    loan2.display();

    cout << "\nTotal monthly payment for both loans: " << loan1.add_loans(loa

    return 0;
}

void Loan::set() {
    cout << "Enter the ID of this loan: ";
    cin >> ID;
    cout << "Enter the amount of this loan: ";
    cin >> amount;
    cout << "Enter the annual interest rate of this loan (in %): ";
    cin >> rate;
    cout << "Enter the term (number of months, length of the loan): ";
    cin >> term;
    monthly_payment = payment(); // Calculate and store the monthly payment after setting details
```

```
Microsoft Visual Studio Debu
Enter details for the first loan:
Enter the ID of this loan: 2000
Enter the amount of this loan: 020
Enter the annual interest rate of this loan (in %): 200
Enter the term (number of months, length of the loan): 200
Enter details for the second loan:
Enter the ID of this loan: 102
Enter the amount of this loan: 210
Enter the annual interest rate of this loan (in %): 120
Enter the term (number of months, length of the loan): 102

First loan details:
The ID of the loan is: 2000
The Amount of the loan is: 20
The annual interest rate is: 200
The term of the loan is: 200 months
The monthly payment will be: 3.33333

Second loan details:
The ID of the loan is: 102
The Amount of the loan is: 210
The annual interest rate is: 120
The term of the loan is: 102 months
The monthly payment will be: 21.0013

Total monthly payment for both loans: 24.3346

C:\Users\LOVE4\source\repos\ex113\x64\Debug\ex113.exe (process 15020) exited with code 0.
Press any key to close this window . . .
```

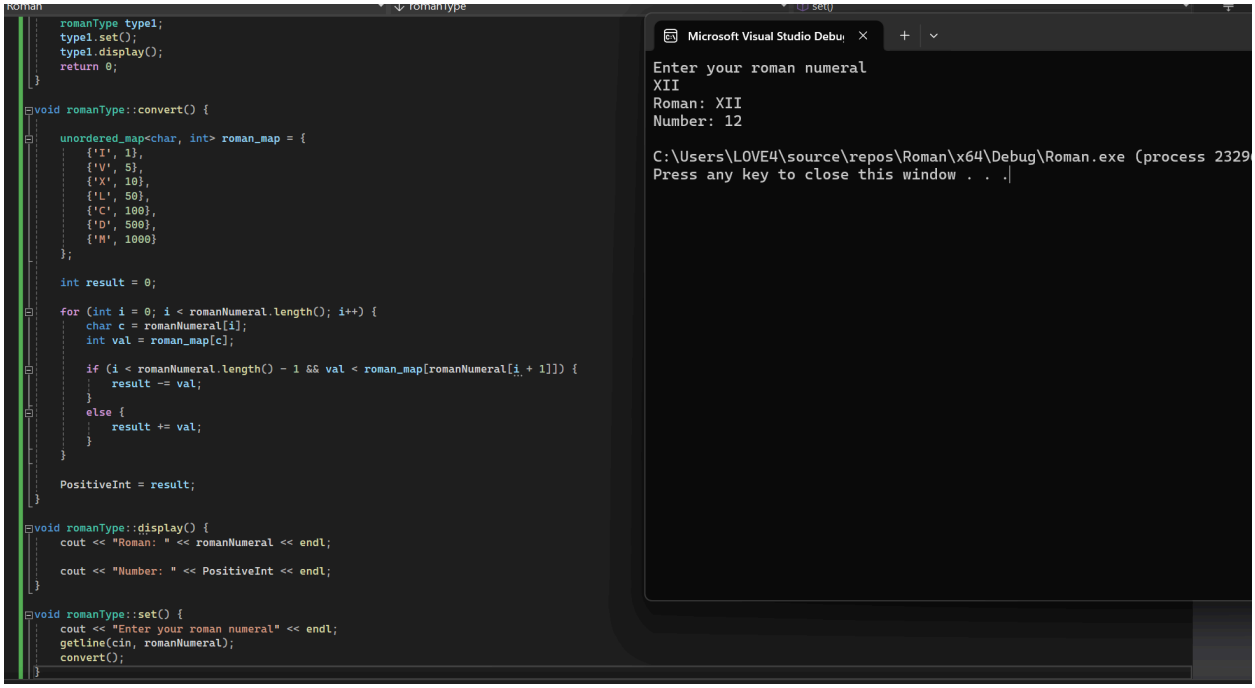
11.4



```cpp
class Loan {
public:
    Loan(); // Default constructor
    Loan(int initID, float initAmount, float initRate, int initTerm); // Parameterized
    void set();
    float payment();
    void display();
    float add_loans(Loan loan1, Loan loan2);
private:
    int ID; // Assume an unique integer between 1111-9999
    float amount; // $ amount of the loan
    float rate; // annual interest rate
    int term; // number of months, length of the loan
    float monthly_payment; // to store the monthly payment of the loan
};

int main() {
    Loan loan1; // Using default constructor
    Loan loan2(1234, 5000, 5.5, 24); // Using parameterized constructor

    cout << "Enter details for the first loan:\n";
    loan1.set();

    cout << "\nFirst loan details:\n";
    loan1.display();
    cout << "\nSecond loan details:\n";
    loan2.display();

    cout << "\nTotal monthly payment for both loans: " << loan1.add_loans(loan1, loan2

    return 0;
}

Loan::Loan() : ID(0), amount(0.0), rate(0.0), term(0), monthly_payment(0.0) {
    // Default constructor with initialization list
}

Loan::Loan(int initID, float initAmount, float initRate, int initTerm) :
    ID(initID), amount(initAmount), rate(initRate), term(initTerm) {
    // Parameterized constructor with initialization list
    monthly_payment = payment(); // Calculate and store the monthly payment
}
```

```
Microsoft Visual Studio Debu
Enter details for the first loan:
Enter the ID of this loan: 102
Enter the amount of this loan: 102
Enter the annual interest rate of this loan (in %): 120
Enter the term (number of months, length of the loan): 20

First loan details:
The ID of the loan is: 102
The Amount of the loan is: 102
The annual interest rate is: 120
The term of the loan is: 20 months
The monthly payment will be: 11.9809

Second loan details:
The ID of the loan is: 1234
The Amount of the loan is: 5000
The annual interest rate is: 5.5
The term of the loan is: 24 months
The monthly payment will be: 220.477

Total monthly payment for both loans: 232.458

C:\Users\LOVE4\source\repos\ex114\x64\Debug\ex114.exe (process 5404) exited with code 0.
Press any key to close this window . . .
```

11.5


Roman
romanType
set()
romanType type1;
type1.set();
type1.display();
return 0;
}
void romanType::convert() {
unordered_map<char, int> roman_map = {
{'I', 1},
{'V', 5},
{'X', 10},
{'L', 50},
{'C', 100},
{'D', 500},
{'M', 1000}
};
int result = 0;
for (int i = 0; i < romanNumeral.length(); i++) {
char c = romanNumeral[i];
int val = roman_map[c];
if (i < romanNumeral.length() - 1 && val < roman_map[romanNumeral[i + 1]]) {
result -= val;
}
else {
result += val;
}
}
PositiveInt = result;
}
void romanType::display() {
cout << "Roman: " << romanNumeral << endl;
cout << "Number: " << PositiveInt << endl;
}
void romanType::set() {
cout << "Enter your roman numeral" << endl;
getline(cin, romanNumeral);
convert();
}
Microsoft Visual Studio Debu
Enter your roman numeral
XII
Roman: XII
Number: 12
C:\Users\LOVE4\source\repos\Roman\x64\Debug\Roman.exe (process 2329
Press any key to close this window . . .