

# Building the Program

Occasionally when building the program I have gotten this error:

Your project does not reference “.NETFramework,Version=v4.7.2”

I’m pretty sure this is a bug in Visual Studio. The solution is to delete the bin folder and the obj folder and then build it again.

## Using the Program

Here is a picture of the main screen in the program.



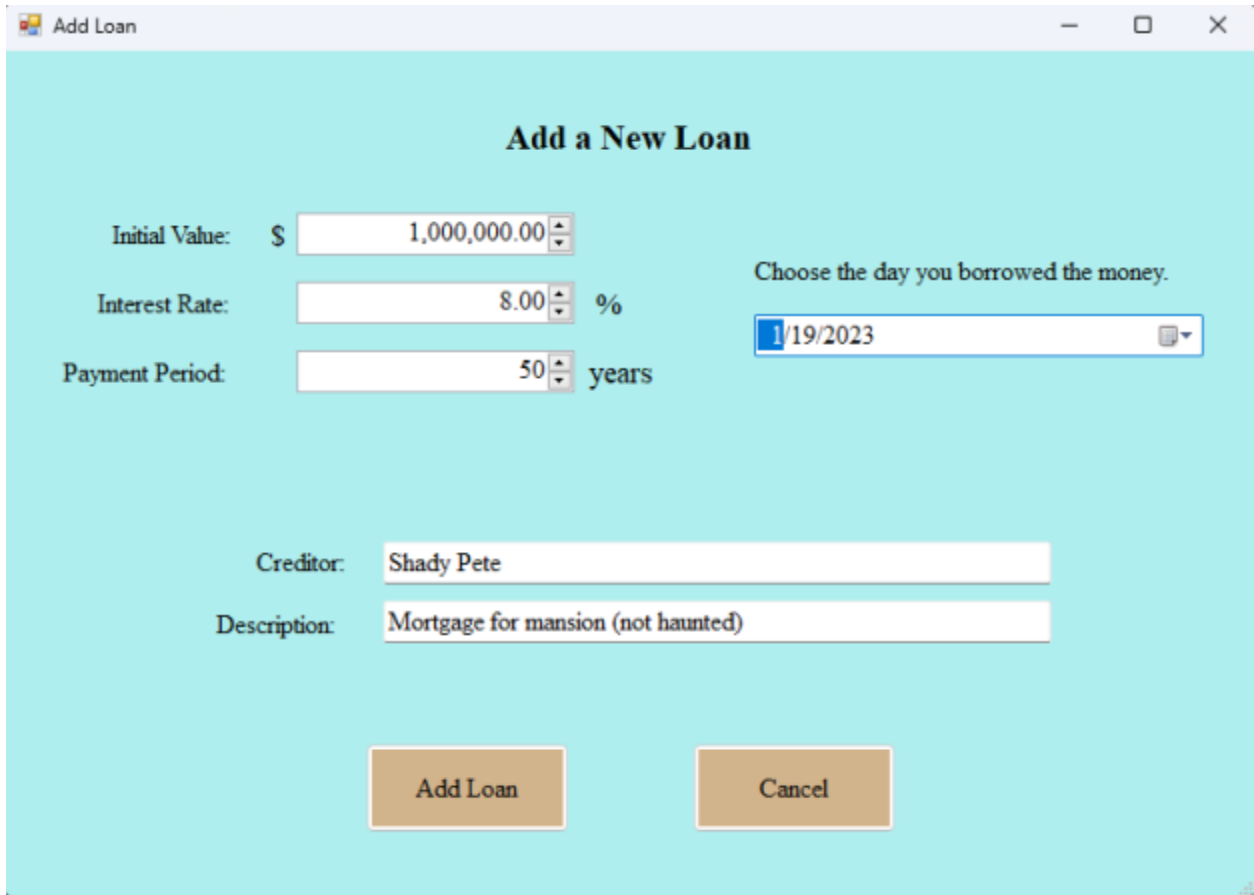
Note there are two tabs: “Edit Loan List” and “Amortization Tables”.

“Edit Loan List” allows the user to manage their loans by adding a new loan, making a payment on a loan, and viewing the payment history for a loan. There is no way to delete or edit a loan or payment once it has been added.

“Amortization Tables” allows the user to generate and view amortization schedules for each loan. The user may run amortization schedules using the minimum payment for the loan or with a higher monthly payment.

## Adding a new loan

You add a new loan in the “Edit Loan List” tab. Click the “Add Loan” button and fill out the form that appears.



The screenshot shows a window titled "Add Loan" with a light blue background. The title "Add a New Loan" is centered at the top. The form contains several input fields: "Initial Value:" with a dollar sign and a spinner box set to "1,000,000.00"; "Interest Rate:" with a spinner box set to "8.00" followed by a percent sign; "Payment Period:" with a spinner box set to "50" followed by the word "years"; and a date picker labeled "Choose the day you borrowed the money." set to "1/19/2023". Below these are two text input fields: "Creditor:" with the text "Shady Pete" and "Description:" with the text "Mortgage for mansion (not haunted)". At the bottom are two buttons: "Add Loan" and "Cancel".

Once you have filled out the form, click “Add Loan” to add the loan to the list or “Cancel” to leave the form without adding a loan.

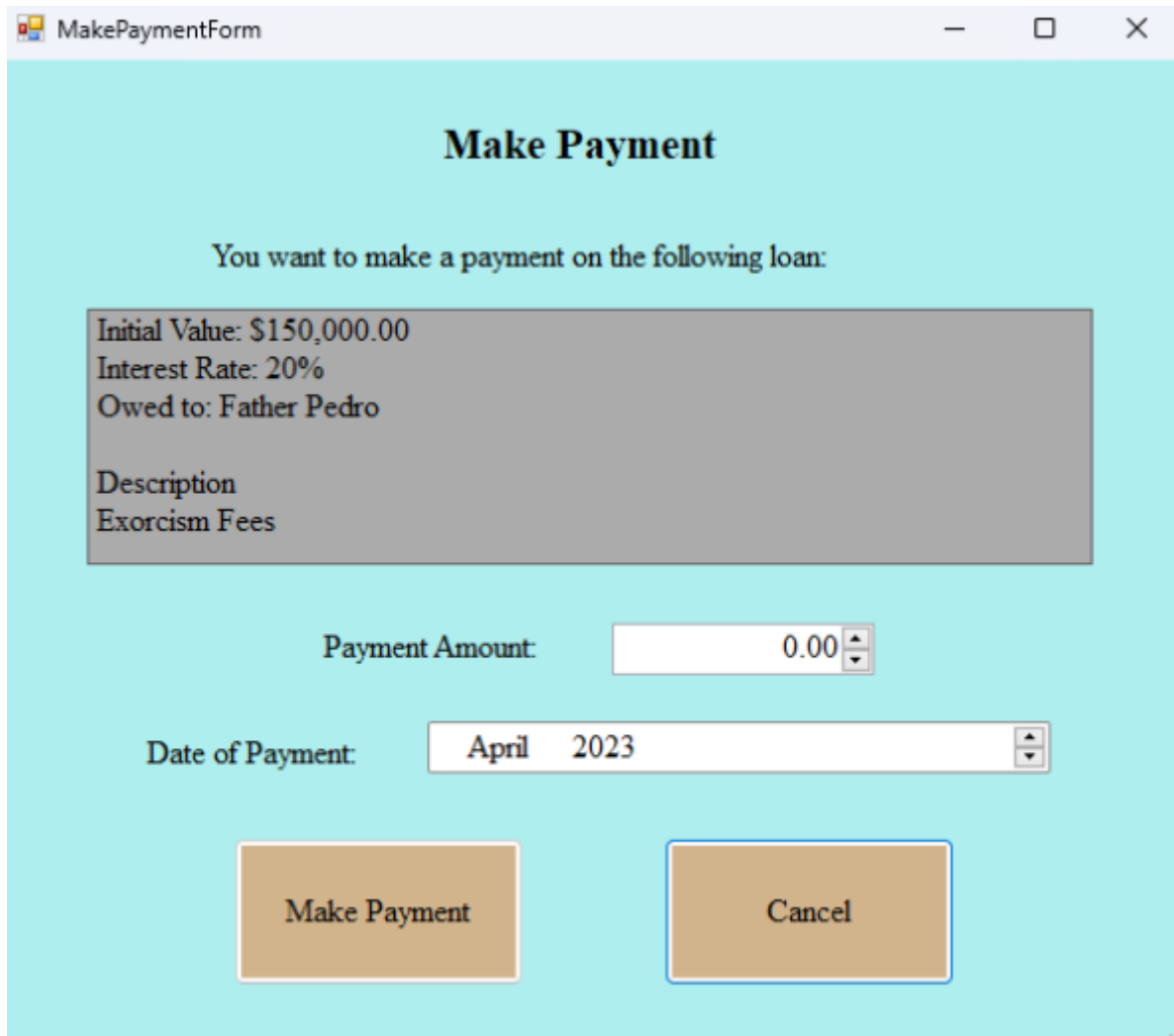
All fields are required except for the description. You will not be able to add a loan to the list if a required field is empty.

It is not possible to add a loan with a date in the future. For example, if today is May 2nd, you will not be able to add a loan with the date May 3rd.

It is not possible to delete or edit a loan once it has been added to the list, so make sure you put the information in right the first time.

## Adding payments on an existing loan

To add a payment on a loan, go to the “Edit Loan List” tab, select the loan you want to make a payment on, and click “Make Payment”. Fill out the form and click “Make Payment” to make the payment or “Cancel” to close the form without making a payment.



The screenshot shows a window titled "MakePaymentForm" with a light blue background. The main heading is "Make Payment". Below it, a message states: "You want to make a payment on the following loan:". A grey box contains the loan details: "Initial Value: \$150,000.00", "Interest Rate: 20%", "Owed to: Father Pedro", "Description", and "Exorcism Fees". Below the grey box, there is a "Payment Amount:" label followed by a text input field containing "0.00" and a small up/down arrow. Below that, there is a "Date of Payment:" label followed by a date picker showing "April 2023". At the bottom, there are two buttons: "Make Payment" and "Cancel".

**Make Payment**

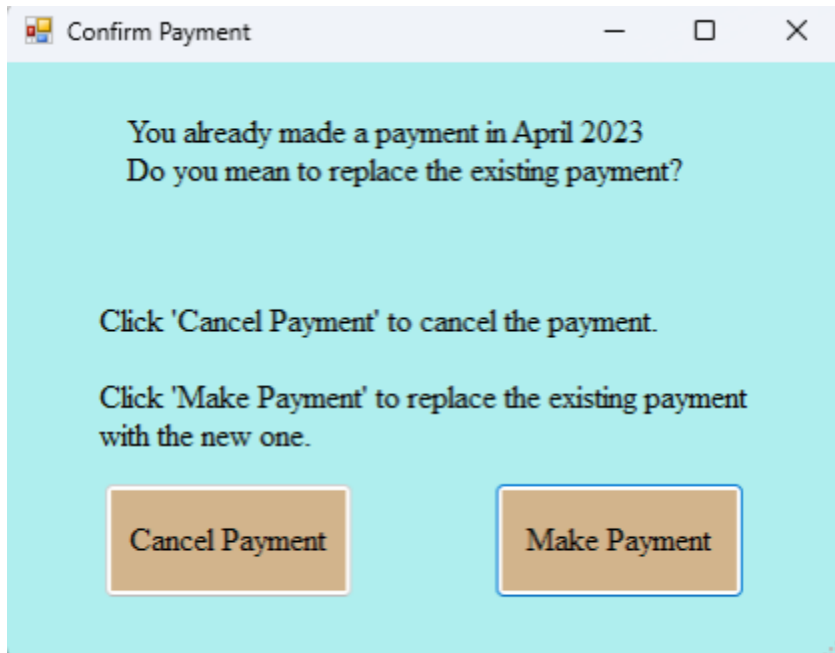
You want to make a payment on the following loan:

Initial Value: \$150,000.00  
Interest Rate: 20%  
Owed to: Father Pedro  
Description  
Exorcism Fees

Payment Amount:

Date of Payment:

To make the program logic simpler, it is not possible for the user to make a payment with a future date, to make a payment the same month they took out the loan, or to make multiple payments in one month. If the user tries to make a payment on a loan in a month that they have already made a payment, the user will be given the option to either cancel the payment or to replace the existing payment with the new one.



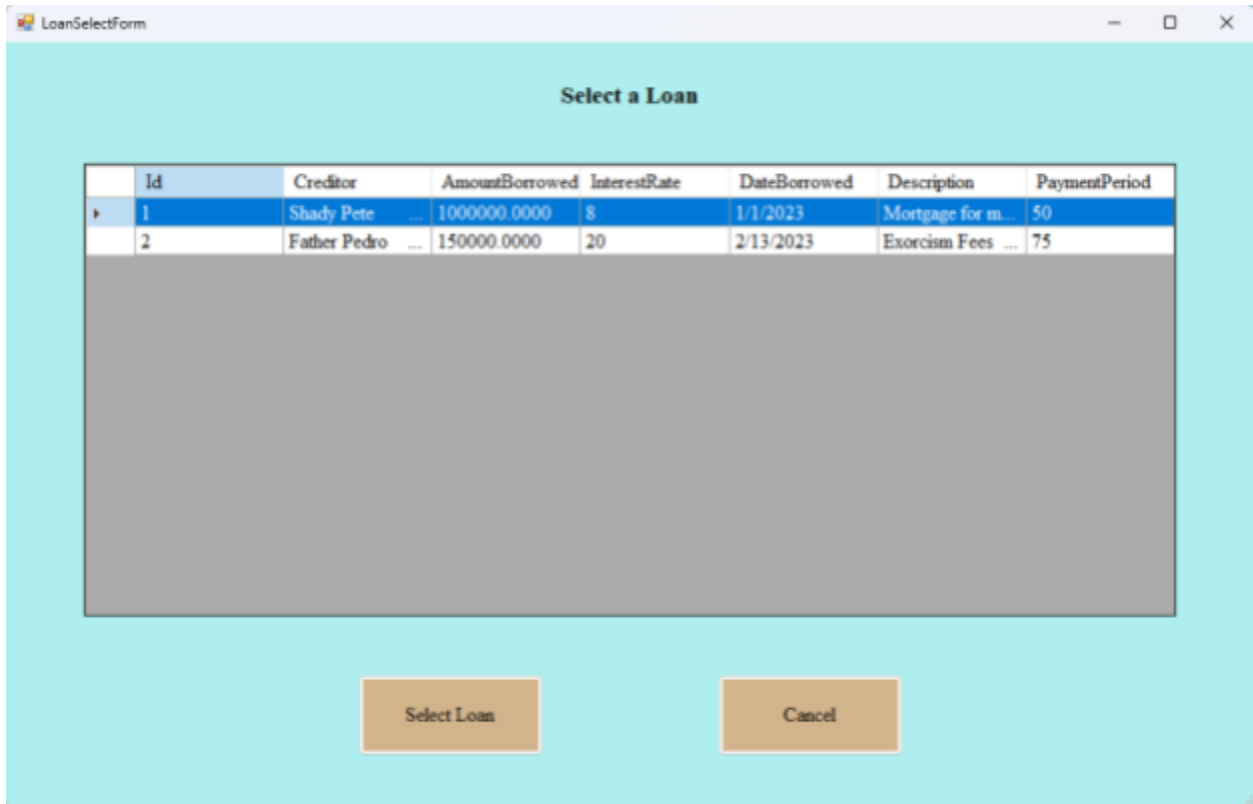
There is no way to delete or edit a payment once it has been made except by replacing it with a new payment.

## Viewing amortization schedules

You can view amortization schedules in the “Amortization Tables” tab.



Click the “Choose Loan” button. This will show you a list of all loans.



The screenshot shows a window titled "LoanSelectForm" with a light blue background. At the top center, the text "Select a Loan" is displayed. Below this is a table with the following data:

Id	Creditor	AmountBorrowed	InterestRate	DateBorrowed	Description	PaymentPeriod
1	Shady Pete ...	1000000.0000	8	1/1/2023	Mortgage for m...	50
2	Father Pedro ...	150000.0000	20	2/13/2023	Exorcism Fees ...	75

Below the table is a large gray rectangular area. At the bottom of the window, there are two buttons: "Select Loan" and "Cancel".

Select the loan you want to choose so it is highlighted in blue. Then, click the “Select Loan” button.

Once you have selected a loan, you will see the amortization table and be given options to customize the display.

**Amortization Schedule Calculator**

Edit Loan List   Amortization Tables

Current Balance: \$999,493.32  
Minimum Payment: \$6,791.89

Show Past Payments  
☒ Include past payments in amortization schedule.  
☐ Show future payments only.

Payment Amount  
☐ Make minimum payments (Uncheck this box to change payment amount)  
 Other payment amount: 7000

PaymentNumb	PaymentAmou	InterestAccrue	PrincipalPayme	Balance
1	\$7,000.00	\$6,666.67	\$333.33	\$999,666.67
2	\$7,000.00	\$6,664.44	\$335.56	\$999,331.11
3	\$6,500.00	\$6,662.21	(\$162.21)	\$999,493.32
4	\$7,000.00	\$6,663.29	\$336.71	\$999,156.61
5	\$7,000.00	\$6,661.04	\$338.96	\$998,817.65
6	\$7,000.00	\$6,658.78	\$341.22	\$998,476.44
7	\$7,000.00	\$6,656.51	\$343.49	\$998,132.95
8	\$7,000.00	\$6,654.22	\$345.78	\$997,787.16
9	\$7,000.00	\$6,651.91	\$348.09	\$997,439.08
10	\$7,000.00	\$6,649.59	\$350.41	\$997,088.67
11	\$7,000.00	\$6,647.26	\$352.74	\$996,735.93
12	\$7,000.00	\$6,644.91	\$355.09	\$996,380.84
13	\$7,000.00	\$6,642.54	\$357.46	\$996,023.38
14	\$7,000.00	\$6,640.16	\$359.84	\$995,663.53
15	\$7,000.00	\$6,637.76	\$362.24	\$995,301.29
16	\$7,000.00	\$6,635.34	\$364.66	\$994,936.63
17	\$7,000.00	\$6,632.91	\$367.09	\$994,569.54
18	\$7,000.00	\$6,630.46	\$369.54	\$994,200.01
19	\$7,000.00	\$6,628.00	\$372.00	\$993,828.01

Choose Loan   Calculate Table

The options in the “Show Past Payments” section allow you to choose whether or not past payments are included in the table. The “Payment Amount” section allows you to view amortization tables for the same loan with different monthly payment amounts. After making changes in either of these sections, click the “Calculate Table” button to update the table.

To view an amortization table using the minimum required payment for the loan, check the box labeled “Make minimum payments” and click the “Calculate Table” button.

To view a schedule using a different payment amount, make sure the box is unchecked. Then, enter the desired payment amount in the box. You will not be allowed to enter a payment lower than the minimum payment or higher than the remaining balance. Click the “Calculate Table” button to view the new table.

## Miscellaneous

Once a loan or a payment on a loan has been added to the list, there is no way to delete or edit it. I might add these features over the summer, but I don't have enough time before the end of the semester to implement and debug new features.

There are still some weird formatting issues in places (e.g. dollar amounts shown to four decimal places in the "Edit Loan List" tab). Once again, I might fix these over the summer but I don't have time now to dive too deep into fixing these.

I had a bit of trouble at first figuring out how to connect the program to the database. I ended up using a framework called Dapper. I learned about it from a video called "How to connect C# to SQL (the easy way)" on the YouTube channel IAmTimCorey, which I found very helpful. Here is a link to the video:

<https://www.youtube.com/watch?v=Et2khGnrlqc&t=3289s>