

DEVELOPMENT DOCUMENTATION

Mortgage Monitor

Easter Institute of Technology NZ Bachelor of Computing Systems

ITPR7.508 Business Application Programming

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Setting up & User settings

Additional documentation has been provided in the README.md

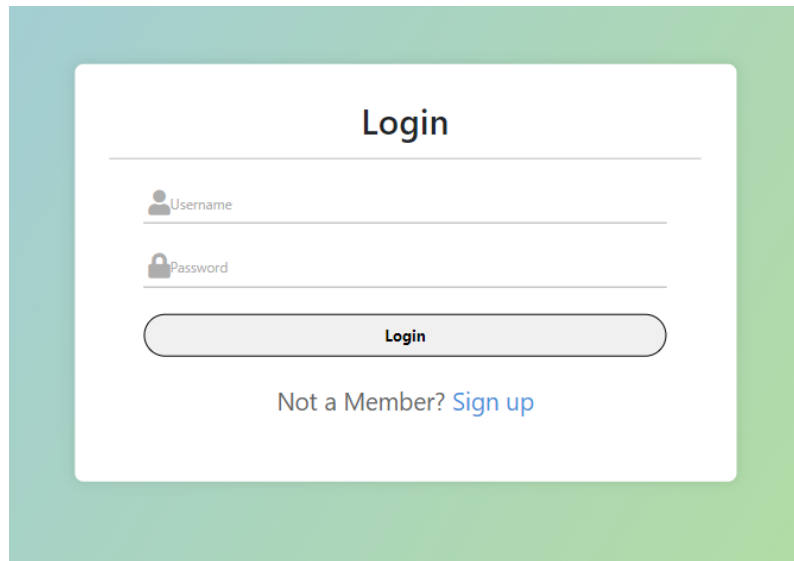
1. start the database and application:

```
PS C:\Users\kathe\Mortgage-Monitor> python database.py
Database not initialized. Creating database...
Creating 'mortgage_calculator' database...
Database and tables created successfully.
Database created successfully.
PS C:\Users\kathe\Mortgage-Monitor> .\web.cmd
PS C:\Users\kathe\Mortgage-Monitor> 
```

A prompt window will display and also display the debugger.

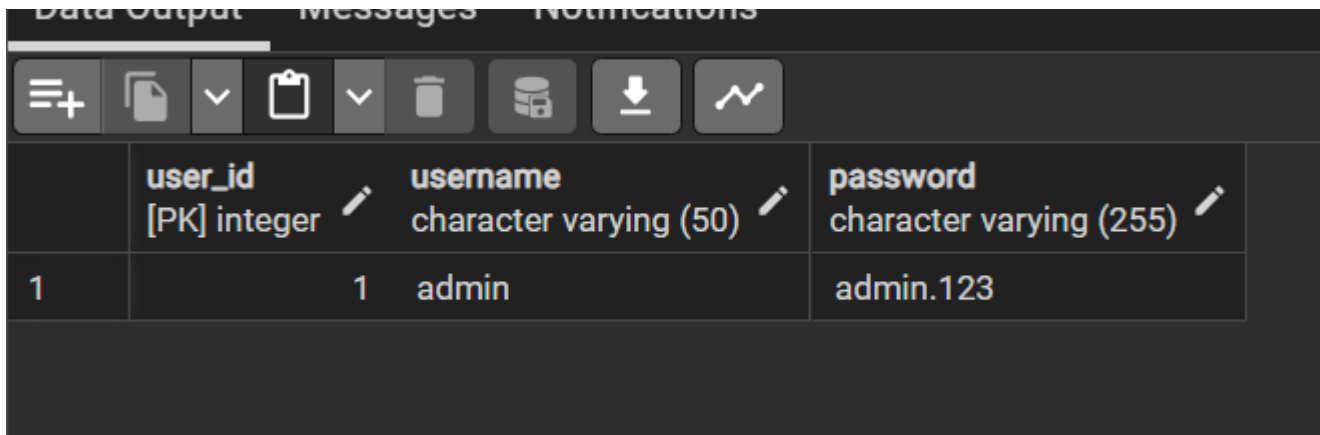
```
C:\Users\kathe\AppData\Local\Programs\Python\Python312\Scripts\python.exe C:\Users\kathe\Mortgage-Monitor\web.cmd
* Serving Flask app 'app'
* Debug mode: on
INFO:werkzeug:WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
INFO:werkzeug:Press CTRL+C to quit
INFO:werkzeug: * Restarting with stat
WARNING:werkzeug: * Debugger is active!
INFO:werkzeug: * Debugger PIN: 141-440-215
INFO:werkzeug:127.0.0.1 - - [09/Jun/2024 11:03:45] "GET / HTTP/1.1" 302 -
INFO:werkzeug:127.0.0.1 - - [09/Jun/2024 11:03:45] "GET /login HTTP/1.1" 200 -
INFO:werkzeug:127.0.0.1 - - [09/Jun/2024 11:03:45] "GET /static/style.css HTTP/1.1" 304 -
INFO:werkzeug:127.0.0.1 - - [09/Jun/2024 11:03:45] "GET /favicon.ico HTTP/1.1" 404 -
```

2. click the link [http:// 127.0.0.1:5000](http://127.0.0.1:5000) and it will show up a login page, you will need to sign up first as a first-time user



The image shows a login page with a white background and a green border. At the top, the word "Login" is centered. Below it, there are two input fields: "Username" with a person icon and "Password" with a lock icon. A "Login" button is centered below the fields. At the bottom, it says "Not a Member? [Sign up](#)".

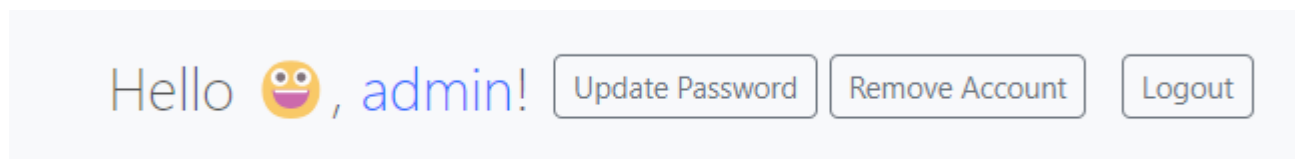
Once you sign up for an account, the user information will be saved into the database.



The image shows a screenshot of a database management tool. At the top, there are tabs for "Data Output", "Messages", and "Notifications". Below the tabs is a toolbar with various icons. The main area displays a table with the following columns: "user_id [PK] integer", "username character varying (50)", and "password character varying (255)". There is one row of data with the values "1", "admin", and "admin.123".

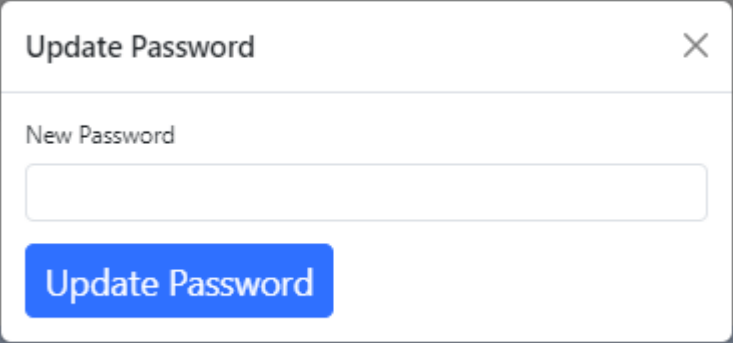
	user_id [PK] integer	username character varying (50)	password character varying (255)
1	1	admin	admin.123

Once logged it will display the index page and on the top right have more users' settings where users can update passwords, remove accounts or log out.



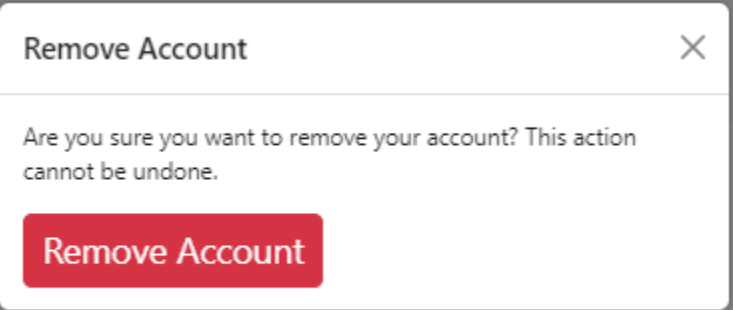
The image shows a user settings bar with a light blue background. It starts with the text "Hello 😊, admin!". To the right of the text are three buttons: "Update Password", "Remove Account", and "Logout".

Users can update their password:



The image shows a modal dialog box titled "Update Password" with a close button (X) in the top right corner. Inside the dialog, there is a label "New Password" above a text input field. Below the input field is a blue button labeled "Update Password". The dialog is set against a dark gray background that features the text "Mortgage Monitor" at the bottom.

Remove account:



The image shows a modal dialog box titled "Remove Account" with a close button (X) in the top right corner. Inside the dialog, there is a confirmation message: "Are you sure you want to remove your account? This action cannot be undone." Below the message is a red button labeled "Remove Account". The dialog is set against a dark gray background that features the text "Mortgage Monitor" at the bottom.

When you click log out it will direct you back to the log-in page.

Creating new mortgage

1. When clicking the add new mortgage button on the top left, it will direct users to this page to set up a mortgage:

The screenshot shows a web interface for calculating a mortgage. It is divided into three main sections: 'Calculate Mortgage', 'Mortgage Results', and a right-hand sidebar.

- Calculate Mortgage:** This section contains a text area for 'Comments' and several input fields: 'Mortgage Name:', 'Principal (\$):', 'Interest (%):', 'Term (Years):', 'Deposit (\$):', and 'Extra Costs (\$)'. Below these is a 'Comments:' label followed by a text area.
- Mortgage Results:** This section is currently empty.
- Right-hand Sidebar:** This section contains a red notification box at the top that reads: 'NOTE: The override amount must be higher than the estimated repayment.' Below this is a 'Start Date:' label followed by a date input field with a calendar icon. There is a checkbox labeled 'Enable Payment Override'. Below that is a 'Monthly Payment Override (\$):' label followed by a text input field. Further down is a 'Fortnightly Payment Override (\$):' label followed by a text input field. At the bottom of the sidebar are three buttons: 'Clear Override', 'Recalculate with Override', and 'Save Mortgage'.

Users will need to mortgage name, principal, interest rate, term, deposit, extra cost and comments to establish a new mortgage calculation.

Under the comment, there is an increment input in which users can decide whether they want to add increment repayment to an additional amount that user can choose to pay on top of their regular mortgage repayment.

Improvement: the increment input function could be added in a separate area instead of within the "Create New Mortgage" section, as it can be confusing and overwhelming for users.

The screenshot shows a web interface for adjusting mortgage increments. It has a title 'Adjust the principal and interest rate increments to explore different mortgage repayment scenarios.' followed by four input fields: 'Principal Increment Value (\$):', 'Number of Principal Increments:', 'Interest Rate Increment Value (%)', and 'Number of Interest Rate Increments:'. At the bottom are two buttons: 'Clear' and 'Calculate'.

Once, the necessary mortgage is inputted it will show the calculation in the mortgage results here

Calculate Mortgage

After calculating your estimated payment, you can input an override amount, provided it is higher than the estimated repayment. Once you're satisfied with your entries, confirm the mortgage, and your details will be displayed on the main page.

Mortgage Name:

first mortgage 2024

Principal (\$):

1050000.0

Interest (%):

7.5

Term (Years):

30

Deposit (\$):

12000.0

Extra Costs (\$):

2000.0

Comments:

the extra cost is for establishment fees

Adjust the principal and interest rate increments to explore different mortgage repayment scenarios.

Principal Increment Value (\$):

0

Number of Principal Increments:

0

Interest Rate Increment Value (%):

0

Number of Interest Rate Increments:

0

Clear

Calculate

Mortgage Results

Initial Payment Breakdown

Mortgage Name: first mortgage 2024

Initial Principal: \$ 1050000.0

Initial Interest: 7.5 %

Initial Term: 30 years

Initial Deposit: \$ 12000.0

Initial Extra Costs: \$ 2000.0

Total Amount Borrowed: \$ 1,040,000.00

Monthly Estimated Repayment: \$ 7,271.83

Monthly Interest: \$ 6,500.00

Monthly Principal: \$ 771.83

Monthly Extra: \$ 0.00

Monthly Total Repayment: \$ 7,271.83

Fortnightly Estimated Repayment: \$ 3,354.73

Fortnightly Interest: \$ 3,000.00

Fortnightly Principal: \$ 354.73

Fortnightly Extra: \$ 0.00

Fortnightly Total Repayment: \$ 3,354.73

Increment Results

Principal Increment Value: \$ 0

Number of Principal Increments: 0

Interest Rate Increment Value: 0 %

Number of Interest Rate Increments: 0

Clear Form

users can also use the increments here and it will display under the form.

Adjust the principal and interest rate increments to explore different mortgage repayment scenarios.

Principal Increment Value (\$):

5000.0

Number of Principal Increments:

5

Interest Rate Increment Value (%):

10.0

Number of Interest Rate Increments:

5

Clear

Calculate

Fortnightly Total Repayment: \$ 3,354.73

Increment Results

Principal Increment Value: \$ 5000.0

Number of Principal Increments: 5

Interest Rate Increment Value: 10.0 %

Number of Interest Rate Increments: 5

Clear Form

Projected Payments Per Month						
Interest Rate	\$1040000.0	\$1045000.0	\$1050000.0	\$1055000.0	\$1060000.0	\$1065000.0
7.5	\$7271.830888948876	\$7306.791614376515	\$7341.752339804154	\$7376.713065231793	\$7411.673790659432	\$7446.634516087071
17.5	\$15249.782366068508	\$15323.098627443836	\$15396.414888819167	\$15469.731150194495	\$15543.047411569825	\$15616.363672945154
27.5	\$23840.16957852976	\$23954.78577842654	\$24069.401978323316	\$24184.018178220093	\$24298.634378116873	\$24413.25057801365
37.5	\$32500.50218520153	\$32656.75459955346	\$32813.00701390539	\$32969.25942825732	\$33125.51184260925	\$33281.76425696118
47.5	\$41166.701757614894	\$41364.618592988045	\$41562.53542836119	\$41760.45226373434	\$41958.36909910749	\$42156.285934480635

Users can input the start date and override payment and click the recalculate with override button and it will show the override results

Improvement/ bug: users should input either monthly or fortnightly. The system will break if users only input one payment override.

Mortgage Results

Initial Payment Breakdown

Mortgage Name: first mortgage 2024

Initial Principal: \$ 1050000.0

Initial Interest: 7.5 %

Initial Term: 30 years

Initial Deposit: \$ 12000.0

Initial Extra Costs: \$ 2000.0

Total Amount Borrowed: \$ 1,040,000.00

Monthly Estimated Repayment: \$ 7,271.83

Monthly Interest: \$ 6,500.00

Monthly Principal: \$ 771.83

Monthly Extra: \$ 728.17

Monthly Total Repayment: \$ 8,000.00

Fortnightly Estimated Repayment: \$ 3,354.73

Fortnightly Interest: \$ 3,000.00

Fortnightly Principal: \$ 354.73

Fortnightly Extra: \$ 645.27

Fortnightly Total Repayment: \$ 4,000.00

Increment Results

NOTE: The override amount must be higher than the estimated repayment.

Start Date:

30/06/2024

☒ Enable Payment Override

Monthly Payment Override (\$):

8000.0

Fortnightly Payment Override (\$):

4000.0

Clear Override

Recalculate with Override

Save Mortgage

Once users have created the new mortgage, they can select different in a dropdown menu to view more details about the mortgage that have just created. In the results display everything they need know based on the Excel spreadsheet the initial payment, mortgage maturity, amortization table, increment projection and graphics display the interest and principal based on the amortization.

Mortgage Monitor

Saved Mortgage:

first mortgage from 2024

Mortgage Name:

first mortgage from 2024

View Updated Mortgage

Update Mortgage

Remove Mortgage

Initial Payment Breakdown

Initial Breakdown	Value
Mortgage Name	first mortgage from 2024
Initial Principal	\$1,050,000.00
Initial Interest	7.5%
Initial Term	30 years
Initial Deposit	\$12,000.00
Initial Extra Costs	\$2,000.00

Monthly Breakdown Details

Monthly Breakdown	Value
Monthly Estimated Repayment	\$7,271.83
Monthly Interest	\$6,500.00
Monthly Principal	\$771.83
Monthly Extra	\$728.17
Monthly Total Repayment	\$8,000.00

Fortnightly Breakdown Details

Fortnightly Breakdown	Value
Fortnightly Estimated Repayment	\$3,354.73
Fortnightly Interest	\$3,000.00
Fortnightly Principal	\$354.73
Fortnightly Extra	\$645.27
Fortnightly Total Repayment	\$4,000.00

Mortgage Maturity Details—Monthly

Maturity Detail	Value
Full Term Payments	360
Interest Over Full Term	\$1,577,859.12
Principal + Interest Full Term	\$2,617,859.12
Total Interest Paid	\$1,109,384.28
Total Repayment	\$2,152,000.00
Total Interest Saved	\$468,474.84
Months to Repay	269

Mortgage Maturity Details—Fortnightly

Maturity Detail	Value
Full Term Payments	780
Interest Over Full Term	\$1,576,692.06
Principal + Interest Full Term	\$2,616,692.06
Total Interest Paid	\$885,100.59
Total Repayment	\$1,928,000.00
Total Interest Saved	\$691,591.47
Fortnight to Repay	482

Start Date:

30-06-2024

Comments:

the extra costs is for establishment fees

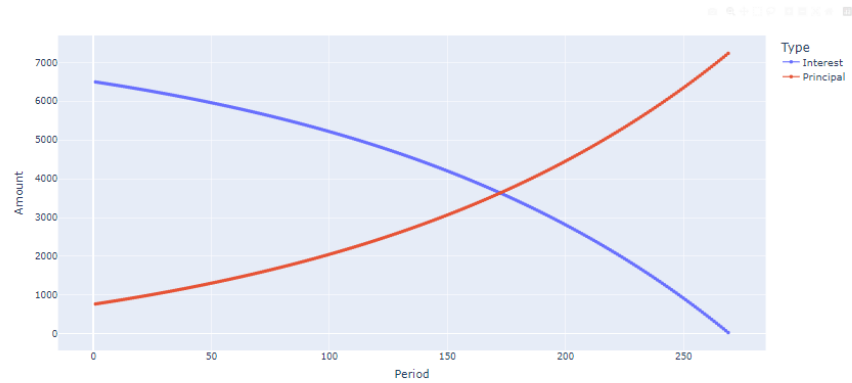
Mortgage Created at:

09-06-2024 19:31:31

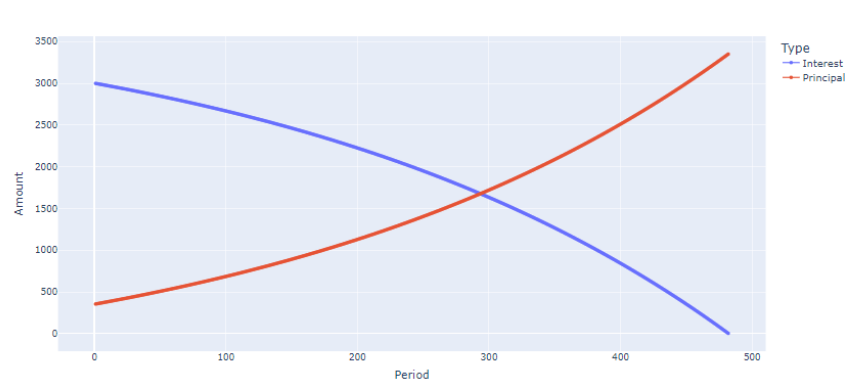
View Increment Projections

View Amortization Schedule

Monthly Amortization Schedule



Fortnightly Amortization Schedule



In the amortization table display the monthly and fortnightly repayment and users can export the table as an Excel spreadsheet.

Mortgage Monitor

Hello 😊 !

Update PasswordRemove AccountLogout


Amortization Schedule

Export as Excel

MonthlyFortnightly

Period	Balance	Interest	Principal	Extra	Total Payment	New Balance	Accumulated Interest	Accumulated Principal Payment
1	\$1,040,000.00	\$6,500.00	\$771.83	\$728.17	\$8,000.00	\$1,038,500.00	\$6,500.00	\$1,500.00
2	\$1,038,500.00	\$6,490.62	\$781.21	\$728.17	\$8,000.00	\$1,036,990.62	\$12,990.62	\$3,009.38
3	\$1,036,990.62	\$6,481.19	\$790.64	\$728.17	\$8,000.00	\$1,035,471.82	\$19,471.82	\$4,528.18
4	\$1,035,471.82	\$6,471.70	\$800.13	\$728.17	\$8,000.00	\$1,033,943.52	\$25,943.52	\$6,056.48
5	\$1,033,943.52	\$6,462.15	\$809.68	\$728.17	\$8,000.00	\$1,032,405.66	\$32,405.66	\$7,594.34
6	\$1,032,405.66	\$6,452.54	\$819.30	\$728.17	\$8,000.00	\$1,030,858.20	\$38,858.20	\$9,141.80
7	\$1,030,858.20	\$6,442.86	\$828.97	\$728.17	\$8,000.00	\$1,029,301.06	\$45,301.06	\$10,698.94
8	\$1,029,301.06	\$6,433.13	\$838.70	\$728.17	\$8,000.00	\$1,027,734.19	\$51,734.19	\$12,265.81
9	\$1,027,734.19	\$6,423.34	\$848.49	\$728.17	\$8,000.00	\$1,026,157.53	\$58,157.53	\$13,842.47
10	\$1,026,157.53	\$6,413.48	\$858.35	\$728.17	\$8,000.00	\$1,024,571.02	\$64,571.02	\$15,428.98
11	\$1,024,571.02	\$6,403.57	\$868.26	\$728.17	\$8,000.00	\$1,022,974.59	\$70,974.59	\$17,025.41
12	\$1,022,974.59	\$6,393.59	\$878.24	\$728.17	\$8,000.00	\$1,021,368.18	\$77,368.18	\$18,631.82
13	\$1,021,368.18	\$6,383.55	\$888.28	\$728.17	\$8,000.00	\$1,019,751.73	\$83,751.73	\$20,248.27
14	\$1,019,751.73	\$6,373.45	\$898.38	\$728.17	\$8,000.00	\$1,018,125.18	\$90,125.18	\$21,874.82
15	\$1,018,125.18	\$6,363.28	\$908.55	\$728.17	\$8,000.00	\$1,016,488.46	\$96,488.46	\$23,511.54
16	\$1,016,488.46	\$6,353.05	\$918.78	\$728.17	\$8,000.00	\$1,014,841.51	\$102,841.51	\$25,158.49
17	\$1,014,841.51	\$6,342.76	\$929.07	\$728.17	\$8,000.00	\$1,013,184.27	\$109,184.27	\$26,815.73
18	\$1,013,184.27	\$6,332.40	\$939.53	\$728.17	\$8,000.00	\$1,011,516.67	\$115,516.67	\$28,493.73

In the increment projection display the mortgage name and monthly fortnightly projected repayment based on the users' inputs and user can export the projection as Excel.

Mortgage Monitor

Hello 🤖, !

Update Password

Remove Account

Logout

first mortgage from 2024

Export Projections as Excel

Monthly

Fortnightly

Projected Payments Per Month


Interest Rate	\$7,271.83	\$7,292.81	\$7,313.78	\$7,334.76	\$7,355.74	\$7,376.71	\$7,397.69	\$7,418.67
5.00%	7,271.83	7,292.81	7,313.78	7,334.76	7,355.74	7,376.71	7,397.69	7,418.67
10.00%	11,099.48	11,131.50	11,163.52	11,195.53	11,227.55	11,259.57	11,291.59	11,323.60
15.00%	15,249.78	15,293.77	15,337.76	15,381.75	15,425.74	15,469.73	15,513.72	15,557.71
20.00%	19,524.34	19,580.66	19,636.98	19,693.30	19,749.62	19,805.94	19,862.26	19,918.58
25.00%	23,840.17	23,908.94	23,977.71	24,046.48	24,115.25	24,184.02	24,252.79	24,321.56
30.00%	28,168.54	28,249.79	28,331.05	28,412.30	28,493.56	28,574.81	28,656.07	28,737.32
35.00%	32,500.50	32,594.25	32,688.01	32,781.76	32,875.51	32,969.26	33,063.01	33,156.76
40.00%	36,833.47	36,939.72	37,045.97	37,152.22	37,258.47	37,364.72	37,470.97	37,577.22
45.00%	41,166.70	41,285.45	41,404.20	41,522.95	41,641.70	41,760.45	41,879.20	41,997.95
50.00%	45,500.01	45,631.26	45,762.51	45,893.76	46,025.01	46,156.26	46,287.51	46,418.76
55.00%	49,833.34	49,977.09	50,120.84	50,264.59	50,408.34	50,552.09	50,695.84	50,839.59
60.00%	54,166.67	54,322.92	54,479.17	54,635.42	54,791.67	54,947.92	55,104.17	55,260.42
65.00%	58,500.00	58,668.75	58,837.50	59,006.25	59,175.00	59,343.75	59,512.50	59,681.25
70.00%	62,833.33	63,014.58	63,195.83	63,377.08	63,558.33	63,739.58	63,920.83	64,102.08
75.00%	67,166.67	67,360.42	67,554.17	67,747.92	67,941.67	68,135.42	68,329.17	68,522.92
80.00%	71,500.00	71,706.25	71,912.50	72,118.75	72,325.00	72,531.25	72,737.50	72,943.75

Unfinished area:

For the updating mortgage area here has bugs that users cannot update their mortgage yet. The idea is that user can input monthly override payment, add additional costs to the mortgage which increase the principal and user can make large one-time payments to reduce the principal amount and be able to add comments.

Mortgage Monitor	Hello 🤖, admin! Update Password Remove Account Logout
Update Mortgage	
Monthly Payment Override	
<input type="text" value="8000.0"/>	
Extra Costs	
<input type="text"/>	
Balloon Payment	
<input type="text"/>	
Comments	
<input type="text"/>	
Update Mortgage	

In the display information here should display the per monthly and fortnightly balance, interest paid, term year and extra payment and extra costs amount.

Mortgage Monitor

Hello 😊, admin!

Update Password

Remove Account

Logout

Mortgage Details

Mortgage Name: first mortgage from 2024

Initial Principal: \$1080000.0

Current Principal: \$1080000.0

Initial Interest Rate: 0.075%

Monthly Payment Override: \$8000.0

Fortnightly Payment Override: \$4000.0

Extra Costs: \$52000.0

Comments:

Transactions

Date	Type	Amount	Current Principal	New Interest Rate	New Monthly Payment	New Fortnightly Payment	Extra Payment	Description
2024-06-09 19:54:29.009509	Update	50000.0	1080000.0	None	8000.0	4000.0	None	20000.0 testing