DEVELOPMENT DOCUMENTATION

Mortgage Monitor

Easter Institute of Technology NZ Bachelor of Computing Systems

ITPR7.508 Business Application Programming

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Contents

Setting up & User settings

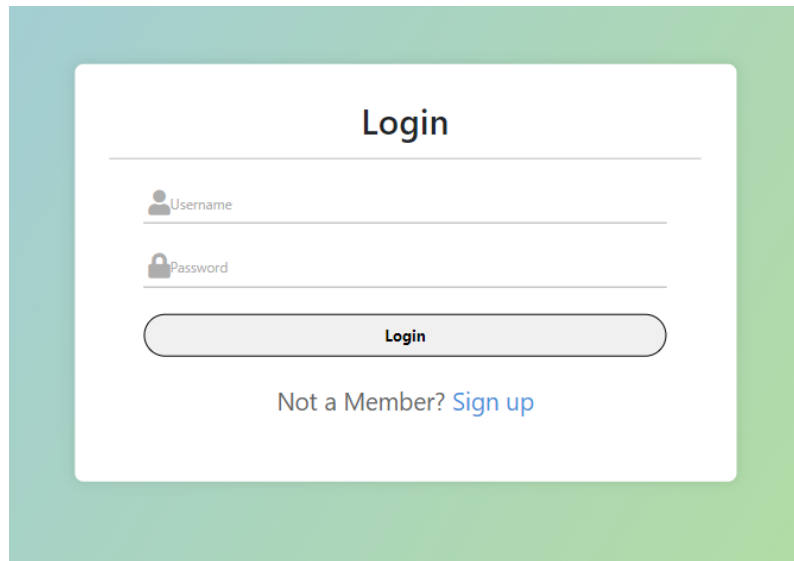Additional documentation has been provided in the README.md

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>
```

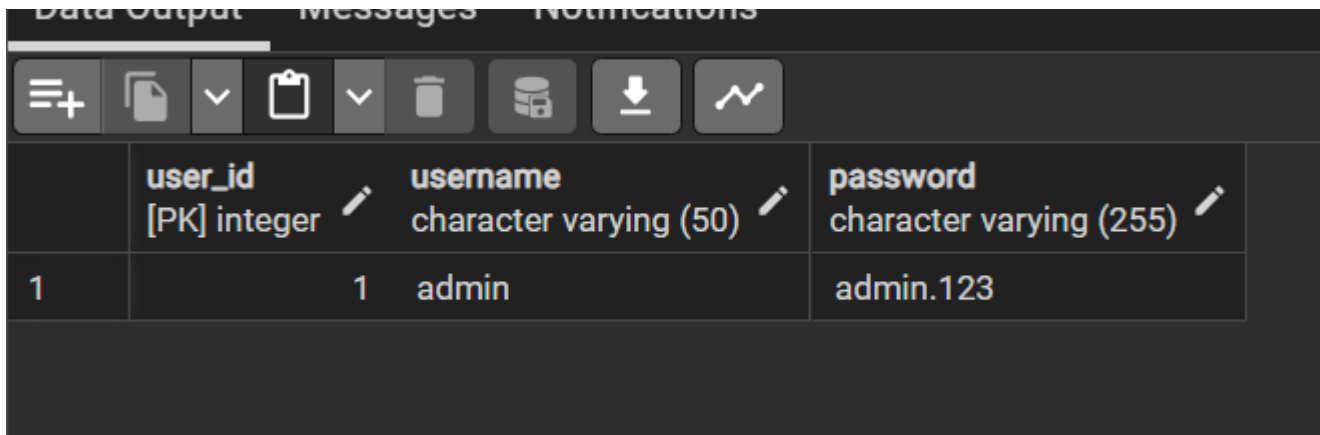A prompt window will display and also display the debugger.

```
 * 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 and it will show up a login page, you will need to sign up first as a first-time user
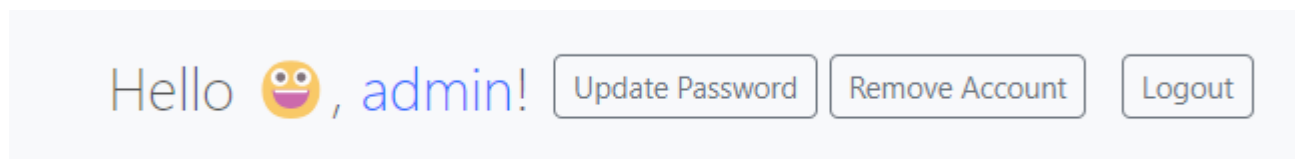
Once you sign up for an account, the user information will be saved into the database.
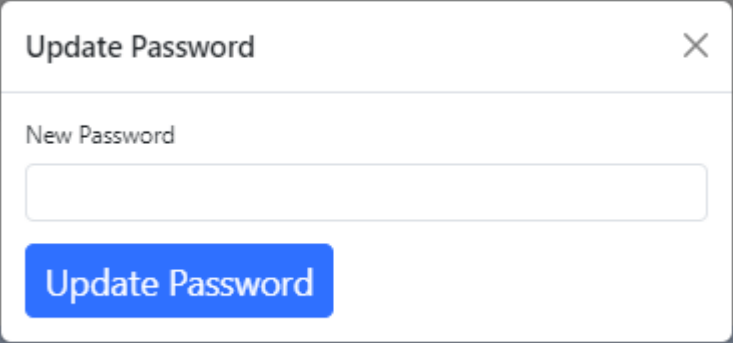
Once logged it will display the index page and on the top right have more users' settings where users can update passwords, remove accounts or log out.
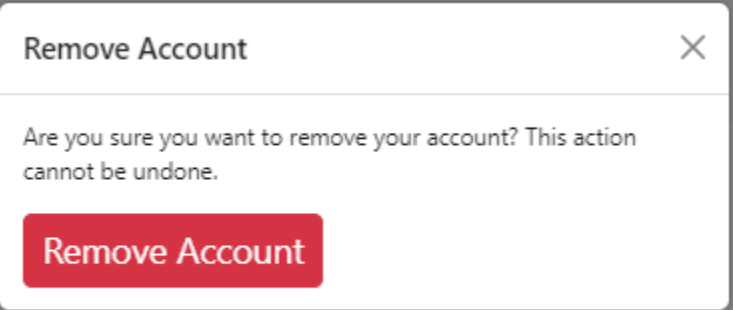
Users can update their password:

Remove account:

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:

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.

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.

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

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

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:
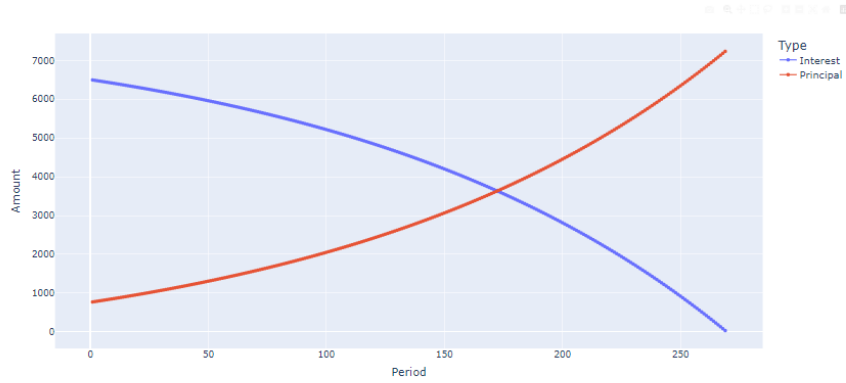the extra costs is for establishment fees

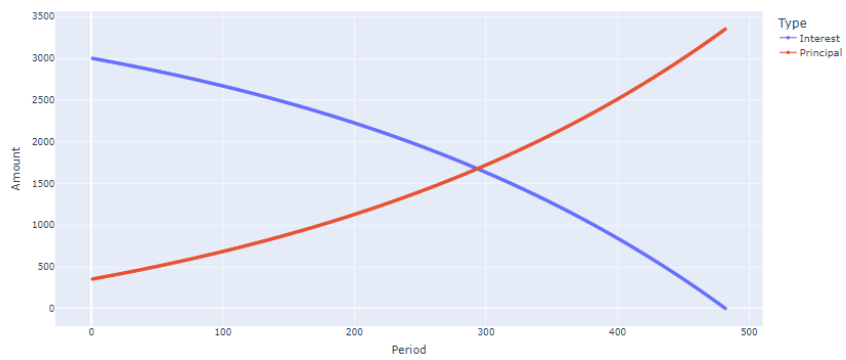**Mortgage Created at:**
09-06-2024 19:31:31

[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.

Hello 😊, ! | Update Password | Remove Account | Logout

Amortization Schedule

Export as Excel

Monthly Fortnightly

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

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
[8000.0]

Extra Costs
[ ]

Balloon Payment
[ ]

Comments
[ ]

[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 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

Overall, the scope for the updates after the initial setup is as follows: Users can add additional costs to the mortgage, which will increase the principal. Additionally, they can make balloon payments to significantly reduce the principal amount. The system tracks transaction history and details such as the transaction date, current principal, current interest rate, remaining term, extra payments, extra costs, and any comments related to the transaction.

The system displays the per monthly balance from the monthly amortization table and the per fortnightly balance from the fortnightly amortization table. It also shows the amount of interest paid according to the amortization schedule, the remaining term in years, and any extra payments or extra costs inputted by the users.

The logical flow is as follows: During the initial setup, users input their mortgage details, and the system calculates the initial repayment amounts and generates an amortization table, allowing users to see the total interest and principal breakdown over the term. For updates and transactions, users can add extra costs or make balloon payments on specified dates, and the system will update the amortization table accordingly. The updated balances and payment breakdowns are displayed, reflecting the impact of these changes, and users can see how their payments and remaining term are affected by the updates.