# Deliverable 2 - Winning pitch: Mortgage Calculator

## Team

Jean Loic Kandikandi, 300113205
Nicolas Thivierge, 300136272

## Problem

First-time home buyers (1) often struggle to gauge whether homes are within their budget. They are unaware of how interest rates and the size of the down payment affect their mortgage. Consequently, this lack of clarity can complicate and frustrate their home buying journey, leaving them uncertain about the affordability of homes they are interested in. Moreover, they usually turn to costly financial advisors in their quest for guidance which can add to their expenses (2).

Changes:

(1) "First-time home buyers" instead of "users/customers", anyone would be able to use our solution (free). This also clarifies our target demographic.
(2) We added this to highlight how our solution can minimize some of the cost related to being a house.

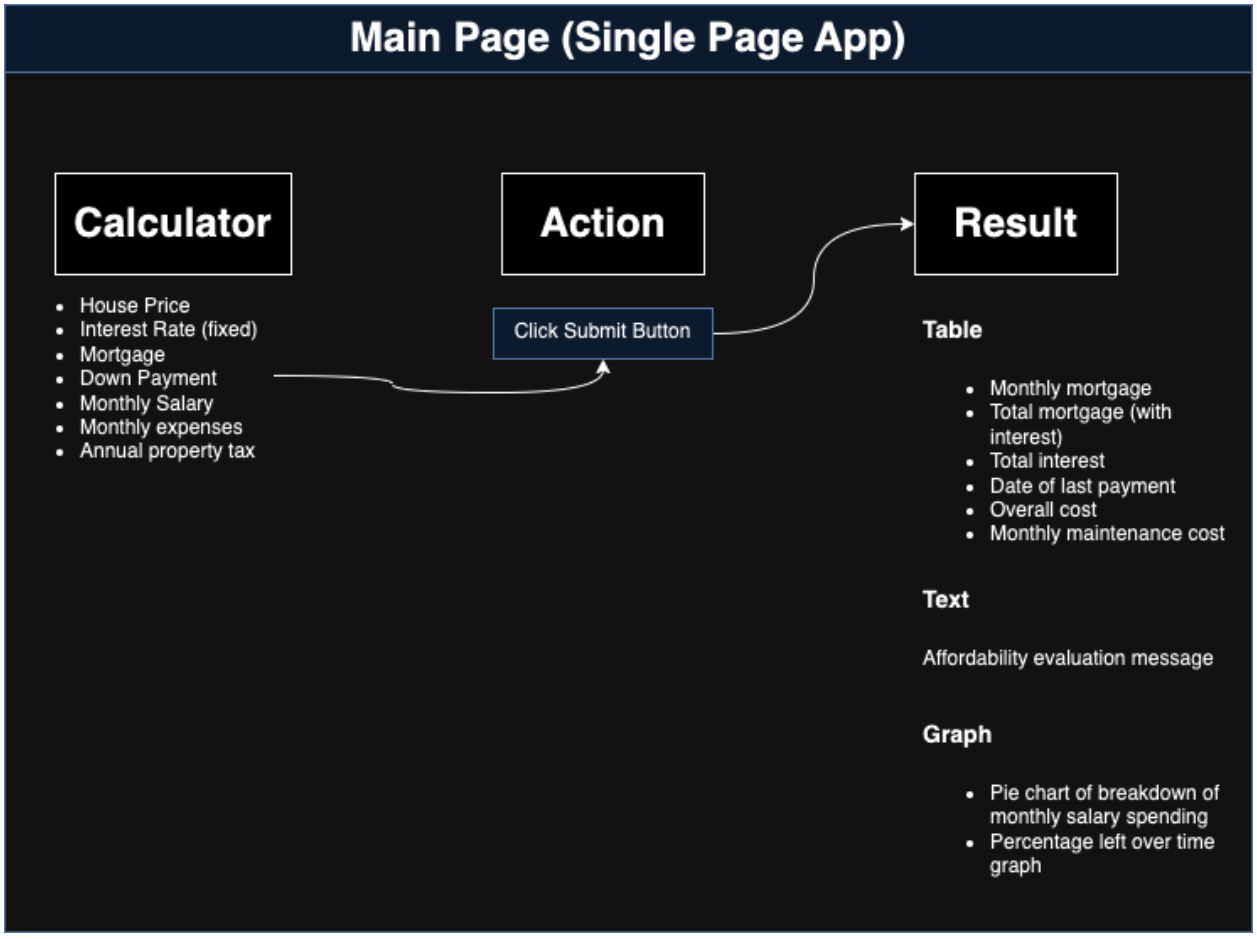
## Appetite

The solution to this problem would be a big batch, this means that our two team members who both share the role of developer/designer are going to be spending 100% of their time during the upcoming 6 week cycle on the feature that solves the problem presented above.

## Solution

The solution suggested is a mortgage calculator that would enable Vaultis users to input essential information, including the property price, annual property taxes (1), interest rate, mortgage duration, down payment, monthly income (2), and monthly expenses (3). The calculator would then generate comprehensive results, presenting the data through tables, graphs, and pie charts (4 and 5). This feature empowers users to conduct their own assessment of the home's affordability. Additionally, the tool will offer its own assessment of the home's affordability based on the provided data. Additionally, it will boast a highly user-friendly and intuitive interface.

# Breadboard

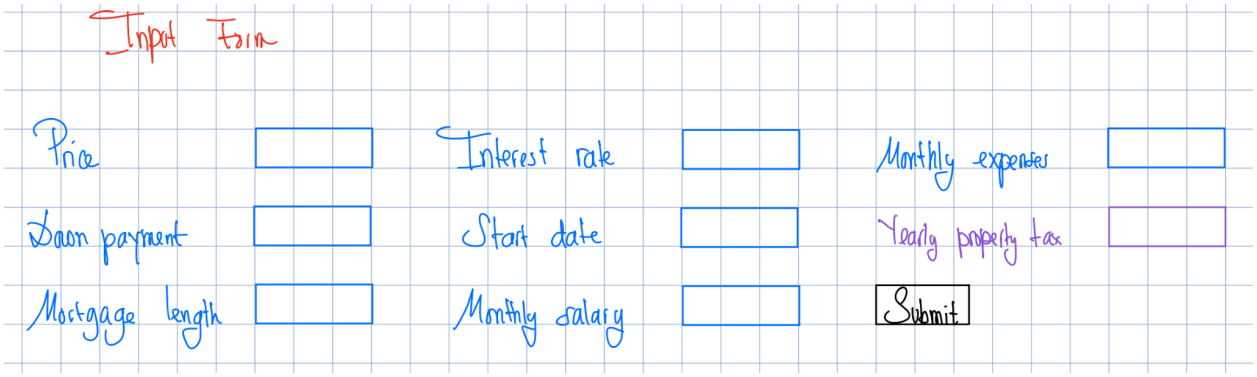



**Changes**

The breadboard was updated to account for additional input data such as annual property tax. Additionally, the results section was updated to include monthly maintenance costs. Clarifications to the pie chart graph and the payment progress graph were added.

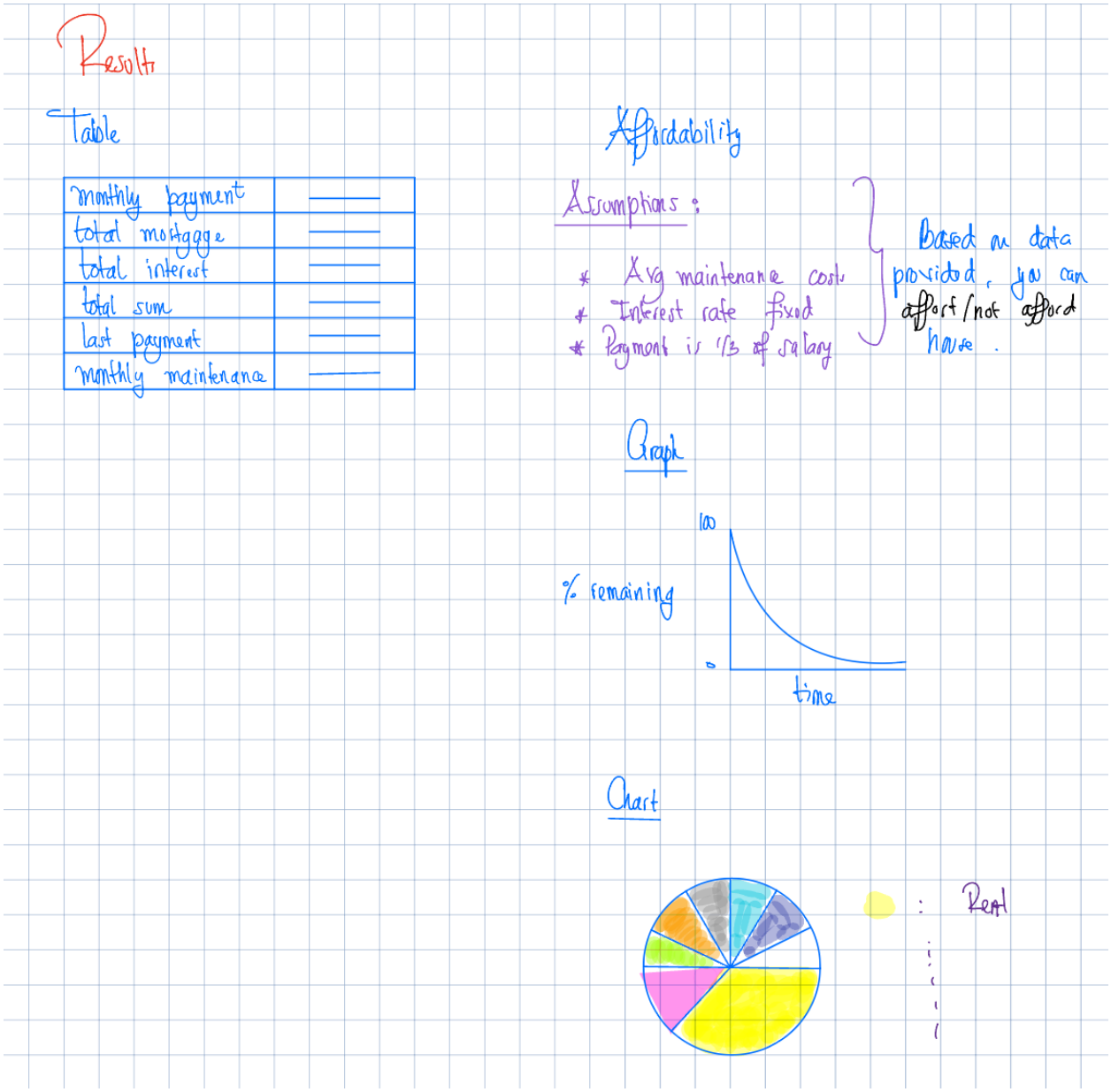
# Fat Marker Sketches

## Calculator Page



On this page, users will encounter a comprehensive set of fields where they are required to input data, as previously mentioned. The data encompasses the home price, annual property taxes (1), down payment, mortgage length, interest rate, monthly income (2), monthly expenses (3), and the mortgage payment start date.

## Results Page




On this page, users will find a table that compiles essential information, including the monthly mortgage payment, total mortgage amount, total interest paid, overall cost, the date of the final payment, and the monthly maintenance cost. Additionally, there's a graphical representation that illustrates the percentage of the house outstanding relative to time, and a pie chart that breaks down the monthly available funds after deducting all expenses. These expenses encompass monthly living costs, monthly maintenance expenses, monthly property taxes, and the monthly mortgage payment (4 and 5). Collectively, these figures should align with the monthly post-tax salary. Last but not least, the page also includes a message summarizing using common language the home's affordability.

**Changes**

(1) Add: Annual property taxes as input field in the calculator page
(2) Specification: Salary input is the monthly salary after taxes.
(3) Specification: Expenses are the monthly expenses excluding current housing expenses.
(4) Change/specification: Pie chart will show monthly money left after all expenses, monthly expenses, monthly maintenance cost, monthly property taxes, monthly mortgage payment. All of this combined together should equate to monthly salary after taxes.
(5) Add: In the results page we are going to add a monthly maintenance cost based on the house price.

# Rabbit Holes

- Elaborate User Interface: It is mentioned that the solution should contain an intuitive and user friendly design.
    - Overly complex graphs and animations could all add to the user's experience but doesn't add any value in the core purpose of the feature which is to determine the affordability of a home.
- Incorporating an API to obtain real time interest rate integration to our feature.
    - This would add some complexity to the code and would not be completely accurate as interest rate will depend from person to person. By providing a simple input field the user is able to enter an interest which will give the same result.
- Optimizing the performance of the calculator. It might be tempting to optimize the speed at which all the calculations are made but it is important to not over do it since a second or so delay might not bother our users as much as the developers.

# No Gos

Here are some of the No Gos I have been able to come up with.

- Including an option in the calculator for extra mortgage payments.
    - This would be a good addition for clients that are interested in paying mortgages quicker in order to save on interest. By adding this to the feature it would allow for them to realize how much money is saved by doing so. This option would definitely add more complexity to the code of the feature and possibly add confusion to the UI of the calculator and would only serve a small portion of our users.

- Refinancing options within the calculator would potentially add much complexity.
    - This feature could overwhelm users who are simply looking for the affordability of a home. Refinancing is also very uncommon for homeowners, evidently this would only serve a few of our users once again.

- Allowing for the option of calculation with adjustable-rate mortgages.
    - This would be useful but a few issues would be presented with this addition: it would be impossible to determine the interest rates of mortgages in the future.

- Allowing for implementation of every local regulation possible.
    - This would be a very time consuming process that would take a lot of research.

- It might be tempting to set the language based on location for example: French if in Quebec or English if anywhere else in the country, but we can simply let the user select this with the use of a simple button.

- Allowing top-ups.
    - It would be useful for some users to see how extra payments would affect their mortgage, but allowing a field to input the amount might not fit the appetite and introduce complexity. We could instead use a set percentage of the monthly regular payment to minimize complexity. (check no gos)

**Changes**

- The two highlighted no gos were rabbit holes but we decided to make them no gos
- Some of these No Gos could be added at a later date in another cycle, especially the first two if we receive requests from users for these added features.