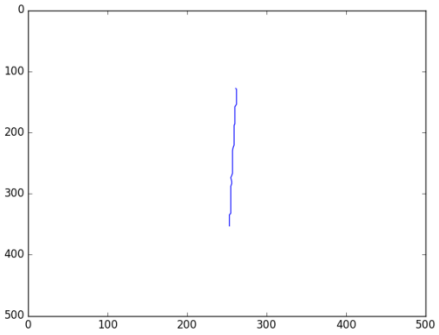
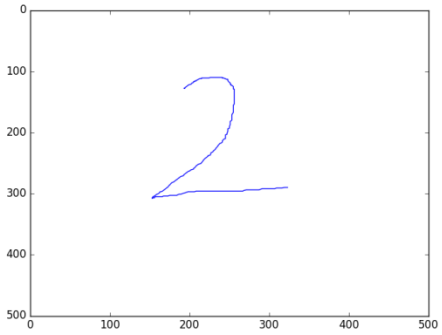
This project is mainly about turning sketched math expressions into MATLAB expressions and calculating them.

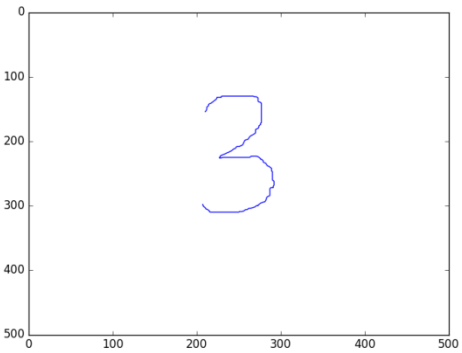
Algorithms we use.

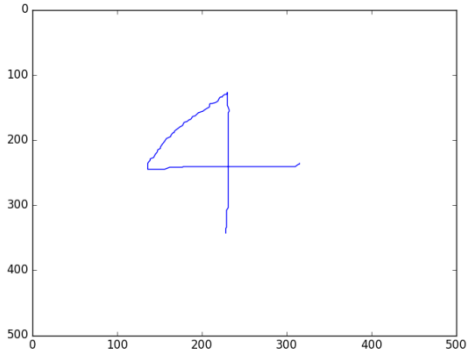
The recognizer uses ADABOOST algorithm, which is the most accurate method we have learnt during the whole semester. There are 20 templates: $1\ 2\ 3\ 4\ 5\ 6\ 7\ 8\ 9\ 0 + - \times / x\ y\ .\ (\ )\ =$

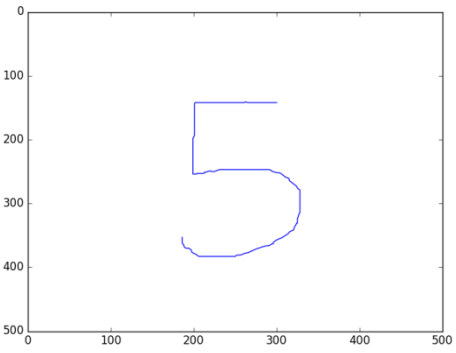
The templates are as follows:

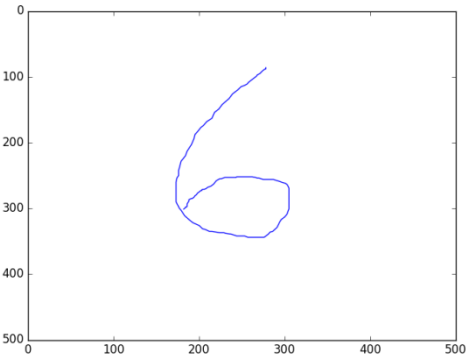


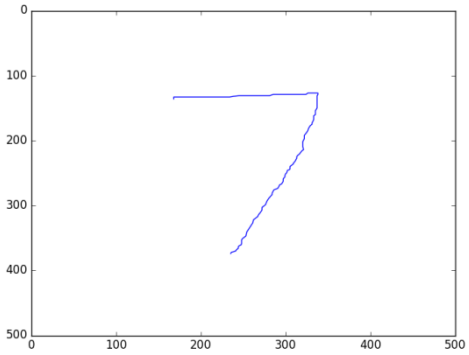
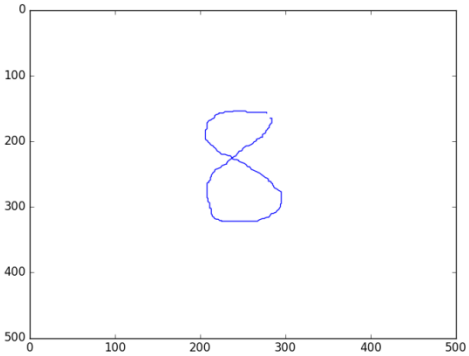
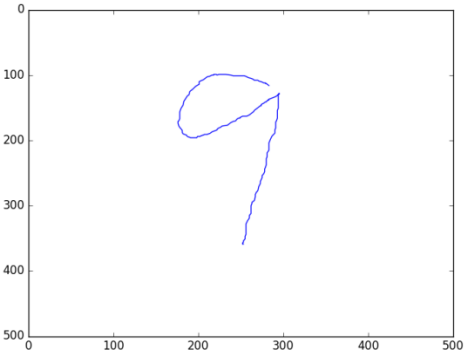
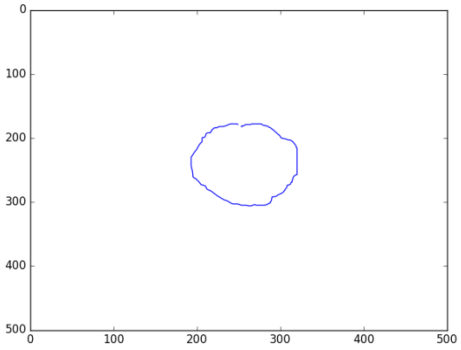
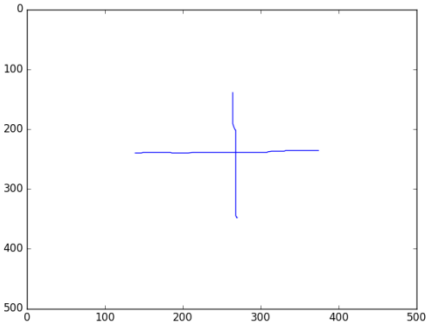
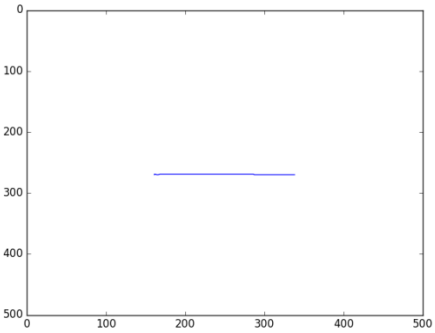
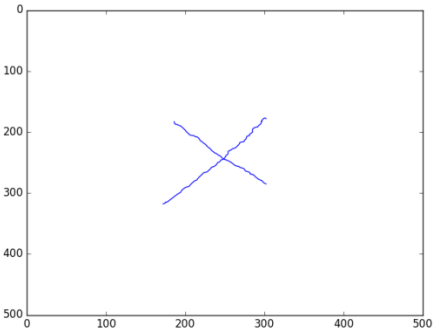
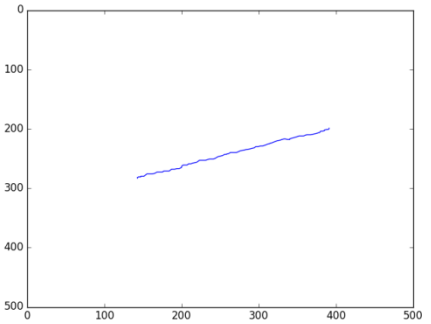


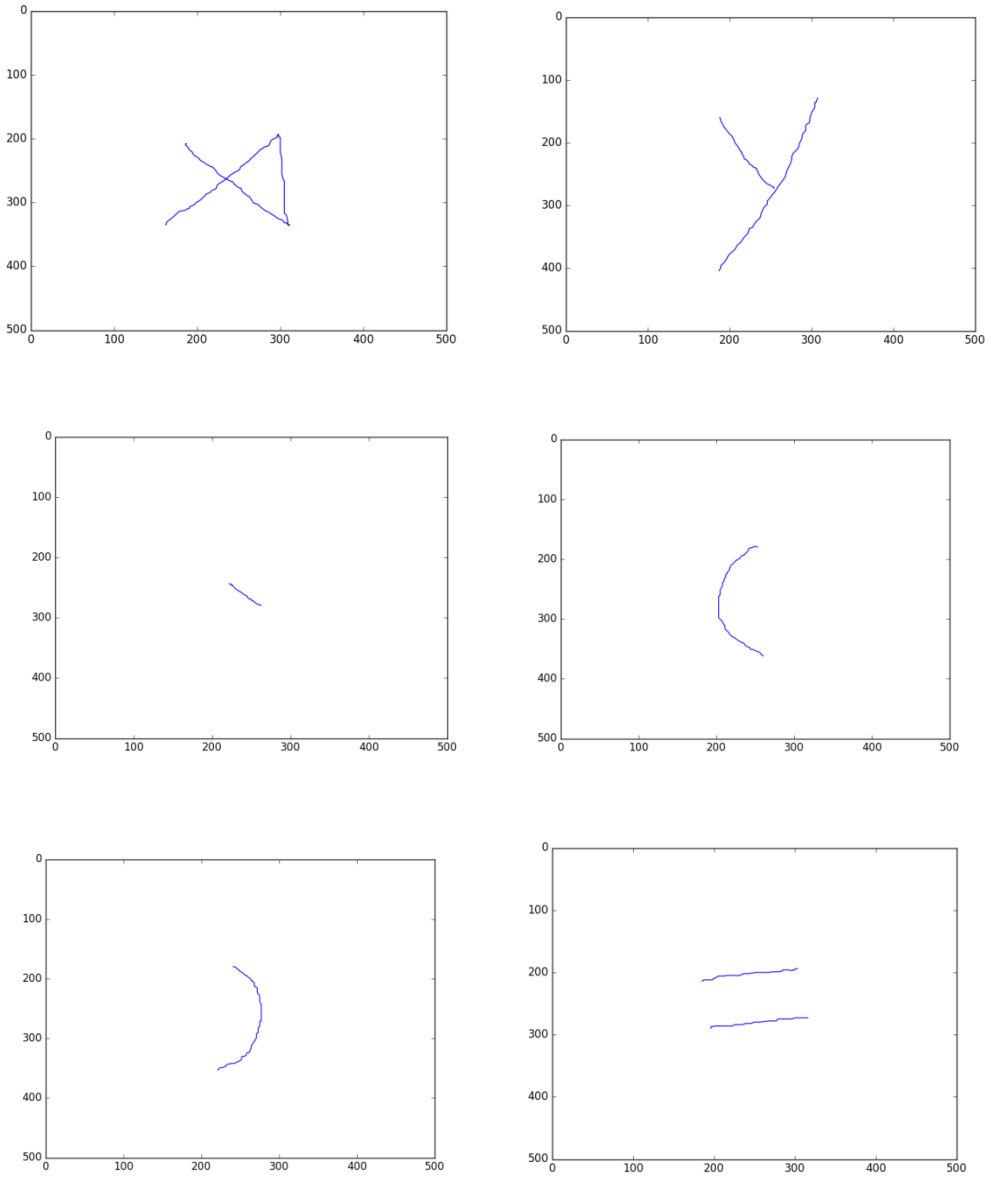










So we can recognize simple math expressions based on the 20 templates. Since the templates are written by Jingzhi Wang himself, there may be some misclassified symbols due to personal writing habits. Larger and clear symbols would be great.

We made ‘power’ easy to write by adding a new part of codes. You don’t have to write the ‘^’ symbol. However, since we have limited templates, so it is better to write power number large and clear. And to make life easier, the power number can contain only one symbol.

After recognizing, we use HMM to correct wrong symbols. For example, when the output from the recognizer is ‘/+3=5x’, it will be modified into ‘1+3=5x’, which makes sense.

How to run the codes.

To run the codes, you need to open the MathInputPanel m-file and then write down symbols one by one. To confirm each symbols you input, you can either press ‘z’

button after sketching or just wait 0.5 second for the system to confirm it automatically.
There are 3 buttons in the panel. The ‘undo’ button will cancel the last symbol that you write. The ‘go’ button will run the recognizer and calculate the result. And the ‘clear’ button will make all the symbols disappear.
After recognizing, we write codes to calculate the expression. For equations contain x and y, it will calculate the value of them. For simple equations like ‘3+1=2’, it will check if the answer is right. When the input is ‘2+3x=2’, it will come up with a result ‘x=0’. Right now we can only calculate one single equation.

You can also watch the video made by Fei Chen about the application of the project.

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