

# Homework 1

CSU0021: Computer Graphics

You will implement a WebGL program for users to draw points, horizontal lines, vertical lines, triangles, squares with a different color at where the user clicks. Users can press keys to change what shape the user wants to draw. The following is the key-shape mapping list.

- 'p': point
- 'h': horizontal line
- 'v': vertical line
- 't': triangle
- 'q': square

This homework does not specify the size of each shape you should draw, but do not draw too big shapes to cover everything.

Users can also press keys to change the color to draw shapes.

- 'r': red
- 'g': green
- 'b': blue

In addition, your program only keeps the last **5 same type of shapes** on the screen. For example, if the user has the sixth click for triangle, you should remove the first triangle and only keep the 2nd, 3rd, 4th, 5th and 6th triangles on the screen.

You can check this short demo video of this homework here, <https://www.youtube.com/watch?v=s92EnQUsMxU&list=PLsId7efYPyAah0Z64j9DpedSVAcvzOSKb&index=3>

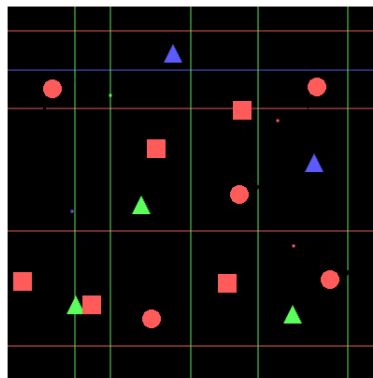


Figure 1: Example

## Note:

- You have to use Vertex Buffer Object (VBO) and shaders to complete this homework. In other words, you can only call `gl.drawArrays()` once to draw "one type of shape." For example, after the user's multiple clicks, you might have to draw 5 triangles for an image frame. You are only allowed to call `gl.drawArrays()` once to draw the 5 triangles. (You will not receive any points if you do not follow this note)
- We also put a template on moodle for your reference

## Bonus (10% of this homework):

Allow users to draw a circle if the user presses 'c' and clicks.

## Submission:

- You have to submit your program to moodle before the deadline. Otherwise, late submission penalty will be applied.
- You have to put all files (`index.html`, `js`) in a folder, zip the folder, rename the zip file to your student ID (e.g., `407470888s.zip`), and submit this zip file to moodle. Ensure that TA can unzip your zip file and drag `index.html` to the browser to run without any extra work. If you do not follow this rule, your homework will be penalized.
- **You have to schedule time with TA to demonstrate your homework (you will not receive any points if you don't):**
  - Please book a 5 minutes time slot here before moodle submission deadline: <https://tinyurl.com/y5jcadve>
  - You are welcome to bring your laptop for this demonstration. **If you will not bring your laptop, make a note when you book the time slot.**
  - make sure you arrive on time
  - TA office: Room 109 Applied Science Building.
  - TA email: `60847071s@gapps.ntnu.edu.tw`
  - **If you submit the homework late, you still have to email TA and book a time for demonstration again. Otherwise, you will not receive any points.**