CS 100M: Lecture 12

March 3

Project 3 Parts A and B are due 3/10
Project 3 parts C and D are due 3/13
Prelim 2 is 3/17

Writing a Graphics Function

Let's write a function that draws this triangle plus median:

\[(x, y) (x + b, y) (x + b/2, y + h)\]

Input Values: \(x, y, b, h\)

Drawing the Triangle

\[xVals = [x, x + b, x + b/2, x];\]
\[yVals = [y, y, y + h, y];\]
\[plot(xVals, yVals)\]

Remember: plot does "connect the Dots".

Drawing the Median

\[\% Connect (x + b/2, y) to (x + b/2, y + h):\]
\[mid = x + b/2;\]
\[plot([mid, mid], [y, y + h])\]

Prelim 1 (mean = 76, std = 18)

Thinking about your score:

85-100 Excellent
70-80 Very good
55-65 Satisfactory but...
< 50 We expect you to discuss your test with a member of the course staff.
Putting it All Together

function DrawTriangle(x,y,b,h)
    mid = x + b/2;
    xVals = [x  x+b  mid  x];
    yVals = [y  y  y+h  y];
    plot(xVals,yVals)
    plot([mid mid], [y y+h])

For this to work, must have hold on.

Now Let’s Draw This:

First..

1. Call DrawTriangle(x,y,b,h) four times

Second....

1. Call DrawTriangle(x,y,b,h) four times
2. Connect the tops.

Third

1. Call DrawTriangle(x,y,b,h) four times
2. Connect the tops.
3. Draw the three verticals

Two-Dimensional Arrays

>> A = [1 2 3 ; 4 5 6]

A =
    1  2  3
    4  5  6

Semicolons separate the rows
Referencing Entries

```
>> A = [1 2 3 ; 4 5 6]
A =
 1 2 3
 4 5 6
>> x = A(1,1) + A(2,3)
x =
  7
```

zeros and ones and rand

```
>> ones(2,3);
>> zeros(2,3);
>> rand(2,3)
A =
 0.13762  0.37632  0.73773
 0.93843  0.12948  0.63994
```

Nested Loop Set-Up

Write a script that produces a 3-by-4 times table:

```
1  2  3   4
2  4  6   8
3  6  9  12
```

```
n = 3; m = 4
for i = 1:n
  % Set up the i-th row
  for j = 1:m
    A(i,j) = i*j;
  end
end
```

A =
```
1  2  3  4
2  4  6  8
3  6  9 12
```
Referencing Rows

```matlab
>> A = magic(4)
A =
   16     2     3    13
   5    11    10     8
   9     7     6    12
   4    14    15     1

>> V = A(3,:)
V =
   9     7     6    12
```