**CS 100M: Lecture 5**

February 8

- Go to Section this Week
- Assignment P2 was Posted last Friday

Typical **For-loop Framework**

```
for <index var> = <first>:<last>
    Loop Body.
end
```

Initialize hit counter

```
hits = 0
for throws = 1:N
    Throw the next dart
    Check if inside the circle and Increase hit counter if it is
end
```

```
hits = 0;
for throws = 1:N
    x = -1+2*rand; y = -1+2*rand;
    Check if inside the circle and Increase hit counter if it is
end
```

```
hits = 0
for throws = 1:N
    x = -1+2*rand; y = -1+2*rand;
    if x^2 + y^2 <=1
        hits = hits + 1;
    end
end
```
Print the maximum of $N$ random numbers to $maxVal$

for $k=1:N$
    Generate the $k$-th rand number $x$
    if $k$ is one then
        Initialize $maxVal$
    else
        if $x$ is larger than $maxVal$ then
            revise $maxVal$
        end
    end
end

for $k=1:N$
    $x = \text{rand}$;
    if $k == 1$
        % Initialize $maxVal$
        $maxVal = x$;
    else
        if $x > maxVal$
            $maxVal = x$;
        end
    end
end

The While Loop

- Another way of specifying iteration
- First example will show that any for-loop can be written as a while loop

for $k=1:N$
    $x = \text{rand}$;
    if $k == 1$
        maxVal ==x;
    else
        maxVal = max($x$,maxVal)
    end
end

for $k=1:N$
    $x = \text{rand}$;
    if $k == 1$
        maxVal ==x;
    else
        maxVal = max($x$,maxVal)
    end
    $k = k+1$;
end

$k = 1$
while $k<=N$
    $x = \text{rand}$;
    if $k == 1$
        maxVal ==x;
    else
        maxVal = max($x$,maxVal)
    end
    $k = k+1$;
end
**Typical While Set-up**

< Initializations >
while < Boolean condition >

Loop Body

end
< stuff to do after the loop >

If the condition is true, execute the loop-body. Otherwise, skip to the next statement after the end.

**Typical While Set-up**

< Initializations >
while < Boolean Condition >

Loop Body

end
< Stuff to do after loop >

Try the condition again after completing the loop body.