Repeating With Loops

Learning Objectives

```
% Explain what a for loop does.
% Correctly write for loops that repeat simple commands.
% Trace changes to a loop variable as the loops runs.
% Use a for loop to process multiple files
```

Part – Intro to Loops

Why we need loops

What we would do without loops:

Clearing the workspace

Display the first number in continent.mass for 2 continents

```
% clear workspace
clear all; clc;

% read in data

load meteorite_landing.mat;

% sum of mass of continent 1
mass1= continent(1).mass(1);
disp(['the mass of the first meteorite to hit continent 1', num2str(mass1)]);
```

```
the mass of the first meteorite to hit continent 1107000
```

```
% sum of mass of continent 2
mass2= continent(2).mass(1);
disp(['the mass of the first meteorite to hit continent 2', num2str(mass2)]);
```

```
the mass of the first meteorite to hit continent 2780
```

Using variables as placeholders (replace number with variable)

```
% read in data

load meteorite_landing.mat;

cn= 1; % variable containing the continent number

% sum of mass of continent 1
mass1= continent(cn).mass(1);
disp(['the mass of the first meteorite to hit continent 1:', num2str(mass1)]);
```

```
the mass of the first meteorite to hit continent 1:107000
```

Turning it into a loop (just write syntax)

```
% read in data
clear all
clc

load meteorite_landing.mat;

for cn=1:7
    mass= (continent(cn).mass(1));
    disp(['the mass of the first meteorite to hit continent', num2str(cn), ':', num2str(mass)]
end
```

```
the mass of the first meteorite to hit continent1:107000
the mass of the first meteorite to hit continent2:780
the mass of the first meteorite to hit continent3:1000
the mass of the first meteorite to hit continent4:21
the mass of the first meteorite to hit continent5:4239
the mass of the first meteorite to hit continent6:11500
the mass of the first meteorite to hit continent7:1000
```

Explain syntax

Set breakpoint and discuss

Step through the loop.

Step through all even continents

Replace 7 with size function & show

```
for cn= 1: size(continent, 2);
    min_mass= min(continent(cn).mass);
    disp(['the min mass of the meteorite to hit continent', num2str(cn), ':', num2str(min_mass
end
```

```
the min mass of the meteorite to hit continent1:0.1g
the min mass of the meteorite to hit continent2:1.1g
the min mass of the meteorite to hit continent3:0g
the min mass of the meteorite to hit continent4:0g
the min mass of the meteorite to hit continent5:0.1g
the min mass of the meteorite to hit continent6:0g
the min mass of the meteorite to hit continent7:0.01g
```

```

```

Part 2: Debugging For Loops

Make an error in the loop, debug it

CHALLENGE:

- Pie.