Executing a function

MATLAB workspace

Execution land

```
>>
```

1

Create nums vector

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8 |

Execution land

```
>> nums = [3 9 6 2 8];
```

2

Invoke myMean function

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8 |

myMean local workspace

Execution land

```
>> nums = [3 9 6 2 8];
>> meanVal = myMean(nums)
```

```
function avg = myMean(data)
dims = size(data);
if (min(dims) == 1)
    avg = sum(data)/length(data);
else
    avg = sum(sum(data))/prod(dims);
end
```

3

Create variable for input parameter data and copy value of nums to data

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8 |

myMean local workspace

data | 3 | 9 | 6 | 2 | 8 |

Execution land

```
>> nums = [3 9 6 2 8];
>> meanVal = myMean(nums)
```

```
function avg = myMean(data)
dims = size(data);
if (min(dims) == 1)
    avg = sum(data)/length(data);
else
    avg = sum(sum(data))/prod(dims);
end
```

4

Execute body of function

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8

myMean local workspace
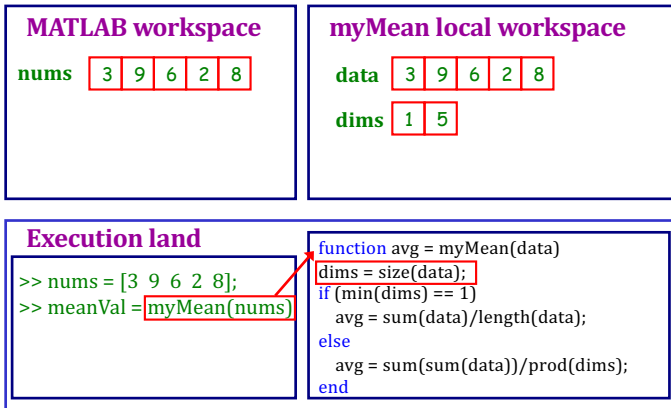
data | 3 | 9 | 6 | 2 | 8

dims | 1 | 5

Execution land

```
>> nums = [3 9 6 2 8];
>> meanVal = myMean(nums)
```

```
function avg = myMean(data)
dims = size(data);
if (min(dims) == 1)
   avg = sum(data)/length(data);
else
   avg = sum(sum(data))/prod(dims);
end
```

5

Is min(dims) == 1?

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8

myMean local workspace

data | 3 | 9 | 6 | 2 | 8

dims | 1 | 5

Execution land

```
>> nums = [3 9 6 2 8];
>> meanVal = myMean(nums)
```

```
function avg = myMean(data)
dims = size(data);
if (min(dims) == 1)
   avg = sum(data)/length(data);
else
   avg = sum(sum(data))/prod(dims);
end
```
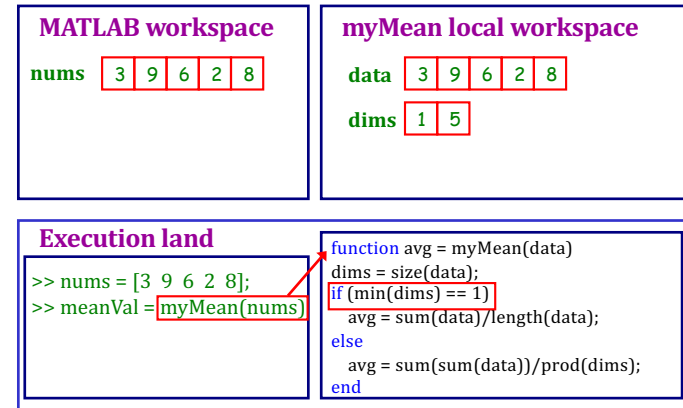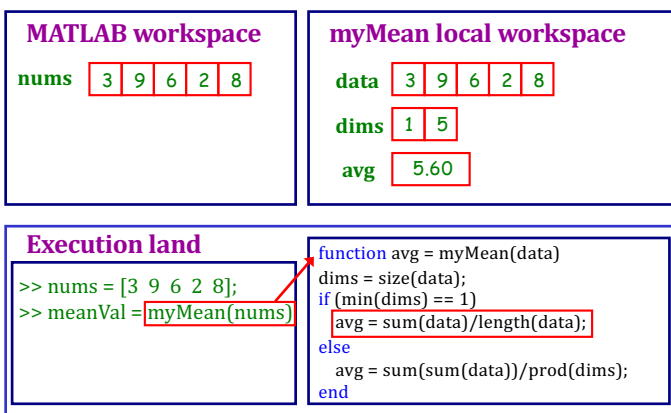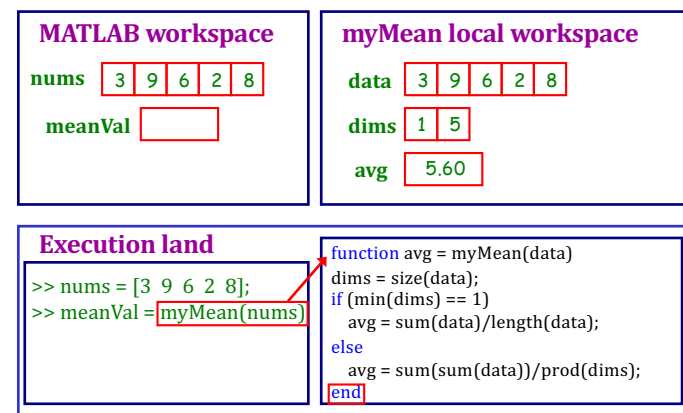
6

Yes, so we do 'then' clause

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8

myMean local workspace

data | 3 | 9 | 6 | 2 | 8

dims | 1 | 5

avg | 5.60

Execution land

```
>> nums = [3 9 6 2 8];
>> meanVal = myMean(nums)
```

```
function avg = myMean(data)
dims = size(data);
if (min(dims) == 1)
   avg = sum(data)/length(data);
else
   avg = sum(sum(data))/prod(dims);
end
```

7

Return value stored in output variable

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8

meanVal

myMean local workspace

data | 3 | 9 | 6 | 2 | 8

dims | 1 | 5

avg | 5.60

Execution land

```
>> nums = [3 9 6 2 8];
>> meanVal = myMean(nums)
```

```
function avg = myMean(data)
dims = size(data);
if (min(dims) == 1)
   avg = sum(data)/length(data);
else
   avg = sum(sum(data))/prod(dims);
end
```

8

And the local workspace goes away

MATLAB workspace

nums | 3 | 9 | 6 | 2 | 8 |

meanVal | 5.60 |

Execution land
```
>> nums = [3 9 6 2 8];
>> meanVal = myMean(nums)
meanVal =
    5.6000
```
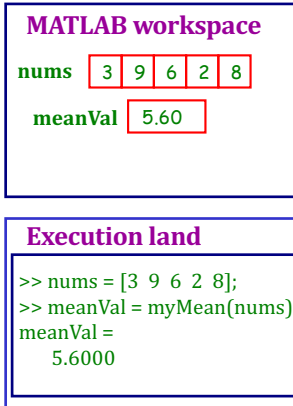
9

Executing **drawCircle** function

MATLAB workspace

Execution land
```
>> drawCircle(40, 50, 50, 'g-*', 1);
```
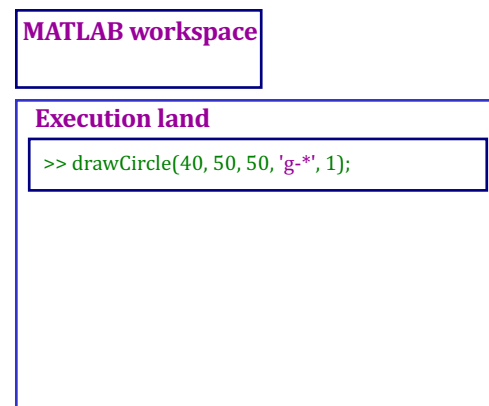
10

Create input parameter variables ...

MATLAB workspace

Execution land
```
>> drawCircle(40, 50, 50, 'g-*', 1);
```
```
function drawCircle (radius, xcenter, ycenter, ...
                    properties, width)
angles = linspace(0, 2*pi, 50);
xcoords = xcenter + radius * cos(angles);
ycoords = ycenter + radius * sin(angles);
plot(xcoords, ycoords, properties, ...
                    'LineWidth', width);
```

drawCircle local workspace

radius | |
xcenter | |
ycenter | |
properties | |
width | |
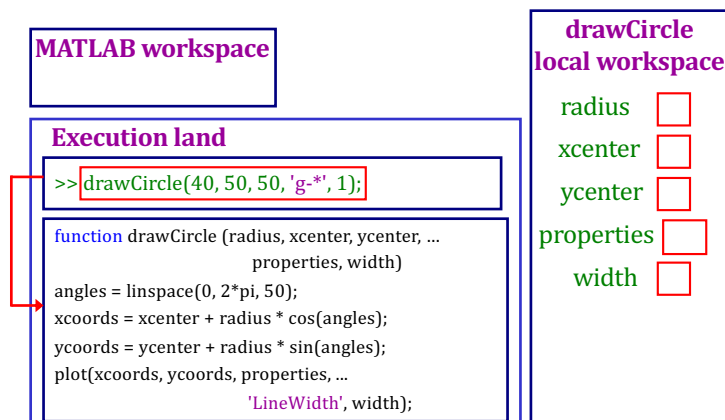
11

... and fill them in from call statement

MATLAB workspace

Execution land
```
>> drawCircle(40, 50, 50, 'g-*', 1);
```
```
function drawCircle (radius, xcenter, ycenter, ...
                    properties, width)
angles = linspace(0, 2*pi, 50);
xcoords = xcenter + radius * cos(angles);
ycoords = ycenter + radius * sin(angles);
plot(xcoords, ycoords, properties, ...
                    'LineWidth', width);
```

drawCircle local workspace

radius | 40 |
xcenter | 50 |
ycenter | 50 |
properties | 'g-*' |
width | 1 |
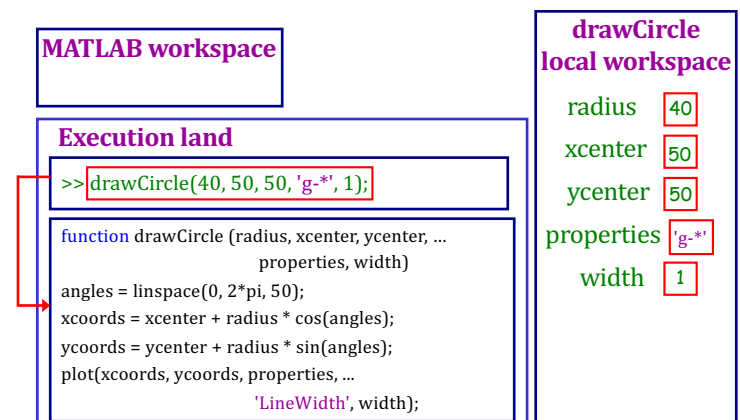
12

Execute body of function

MATLAB workspace

Execution land

`>> drawCircle(40, 50, 50, 'g-*', 1);`

`function drawCircle (radius, xcenter, ycenter, ...`
`                    properties, width)`
`angles = linspace(0, 2*pi, 50);`
`xcoords = xcenter + radius * cos(angles);`
`ycoords = ycenter + radius * sin(angles);`
`plot(xcoords, ycoords, properties, ...`
`                    'LineWidth', width);`

drawCircle local workspace

radius	40
xcenter	50
ycenter	50
properties	g-*
width	1
angles	...

13

Next statement

MATLAB workspace

Execution land

`>> drawCircle(40, 50, 50, 'g-*', 1);`

`function drawCircle (radius, xcenter, ycenter, ...`
`                    properties, width)`
`angles = linspace(0, 2*pi, 50);`
`xcoords = xcenter + radius * cos(angles);`
`ycoords = ycenter + radius * sin(angles);`
`plot(xcoords, ycoords, properties, ...`
`                    'LineWidth', width);`

drawCircle local workspace

radius	40
xcenter	50
ycenter	50
properties	g-*
width	1
angles	...
xcoords	...

14

Next statement

MATLAB workspace

Execution land

`>> drawCircle(40, 50, 50, 'g-*', 1);`

`function drawCircle (radius, xcenter, ycenter, ...`
`                    properties, width)`
`angles = linspace(0, 2*pi, 50);`
`xcoords = xcenter + radius * cos(angles);`
`ycoords = ycenter + radius * sin(angles);`
`plot(xcoords, ycoords, properties, ...`
`                    'LineWidth', width);`

drawCircle local workspace

radius	40
xcenter	50
ycenter	50
properties	g-*
width	1
angles	...
xcoords	...
ycoords	...

15

And we draw the circle

MATLAB workspace

Execution land

`>> drawCircle(40, 50, 50, 'g-*', 1);`

`function drawCircle (radius, xcenter, ycenter, ...`
`                    properties, width)`
`angles = linspace(0, 2*pi, 50);`
`xcoords = xcenter + radius * cos(angles);`
`ycoords = ycenter + radius * sin(angles);`
`plot(xcoords, ycoords, properties, ...`
`                    'LineWidth', width);`

drawCircle local workspace

radius	40
xcenter	50
ycenter	50
properties	g-*
width	1
angles	...
xcoords	...
ycoords	...

16

Where'd everybody go?

MATLAB workspace

Execution land

>> drawCircle(40, 50, 50, 'g-*', 1);

17