

DAILY ASSESSMENT FORMAT

Date:	6 th July2020	Name:	Soundarya NA
Course:	Matlab	USN:	4AL16EC077
Topic:	Matlab	Semester & Section:	8 th - B
Github Repository:	Soundaryana-courses		

FORENOON SESSION DETAILS

Image of session

The image displays two screenshots of the MATLAB Onramp interface, showing the progression through lessons and tasks.

Top Screenshot: Lesson 2.4 Using Built-in Functions and Constants

- Task 1:** MATLAB contains built-in constants, such as π to represent π . The code shows `a = pi` resulting in `a = 3.1416`. A task instruction states: "Create a variable called `x` with a value of $\pi/2$." A hint and solution link are provided.
- Task 2:** (Not detailed in the image)
- Task 3:** (Not detailed in the image)
- Further Practice:** (Not detailed in the image)

Bottom Screenshot: Lesson 4.3 Array Creation Functions

- Task 1:** MATLAB contains many functions that help you to create commonly used matrices, such as matrices of random numbers. The code shows `x = rand(2)` resulting in a 2-by-2 matrix of random numbers. A task instruction states: "Create a variable named `x` that is a 5-by-5 matrix of random numbers." A hint, solution link, and submit button are provided.
- Task 2:** (Not detailed in the image)
- Task 3:** (Not detailed in the image)
- Further Practice:** (Not detailed in the image)

Report:

Commands:

- `clc`clear the command window. Probably the best command of all time to reduce user anxiety.
- `clear all`clear all variables in your workspace. Trust me you'll be using this one.
- `plot()`Plot curves by inserting vectors of the same length in the function. Amazing.
- `subplot()`Plot multiple figures in one window. Godlike.
- `axis([-1 1 -1 1])`Set the minimum x and y axis of your plot. This can be set manually too.
- `legend('string')`Name the data series of your figure. Pretty sweet!
- `shg`Display the figure window instantaneously. No more frustrating clicks!
- `run directory/scriptname`Run another script within your script. Helps you keep it clean and organised.
- `load directory/workspacefile`Load variables saved from the workspace directly to your script.
- `help function`Access the documentation on the usage of the function directly in your command window. This is the command I use the most in MATLAB by far!
- `length(vector)`Returns the length of a vector. Very useful when using for loops.
- `size(matrix)`Returns the size of a matrix. First thing I do when I get dimensioning error messages!
- `ones()`Create a vector or a matrix of ones. This is awesome, forget building a vector like this: `x=[1 1 1 1 1]`, just use `ones(1,5)` and you'r good.
- `zeros()`Creates a vector or a matrix of zeros. Same principle here but with zeros!
- `rand()`Create a random vector or a matrix. So convenient when you'r just goofing around or testing basic things.
- `disp('string')`Display a string in the command window.
- `tic`Start the invisible stopwatch.
- `toc`Stop the stopwatch and get information on the time elapsed! Useful if you want to know the duration of a simulation for example!
- `input()`Prompt the user for an input. Can be very useful when using if conditions.
- `xlsread(directory/filename,sheet,range)`Read a range of data from an excel sheet.

Eg1:

`a = [1 2 3 4 6 4 3 4 5]`

```
a = 1×9
```

```
1 2 3 4 6 4 3 4 5
```

Now let's add 2 to each element of our vector, a, and store the result in a new vector.

Notice how MATLAB requires no special handling of vector or matrix math.

```
b = a + 2
```

```
b = 1×9
```

```
3 4 5 6 8 6 5 6 7
```

```
plot(b)
```

```
grid on
```

```
bar(b)
```

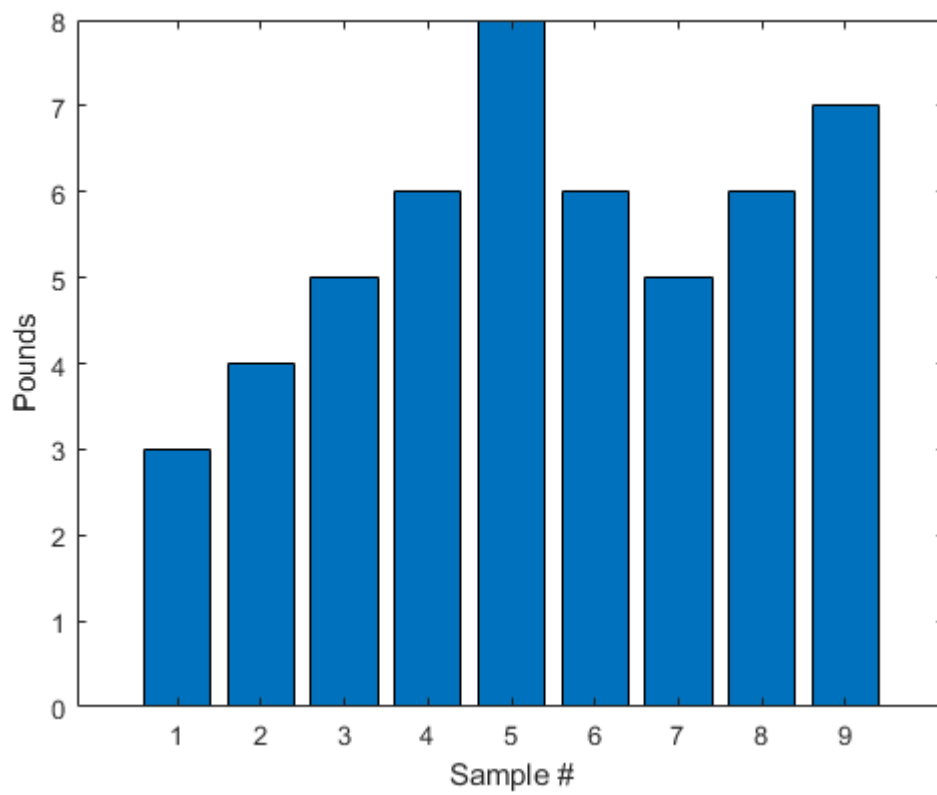
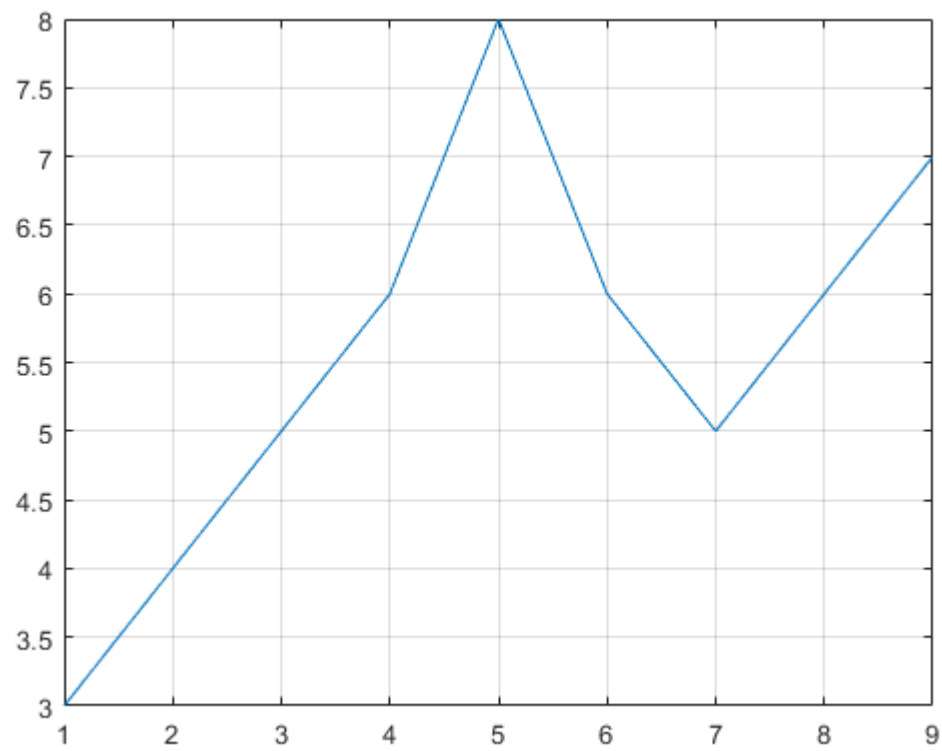
```
xlabel('Sample #')
```

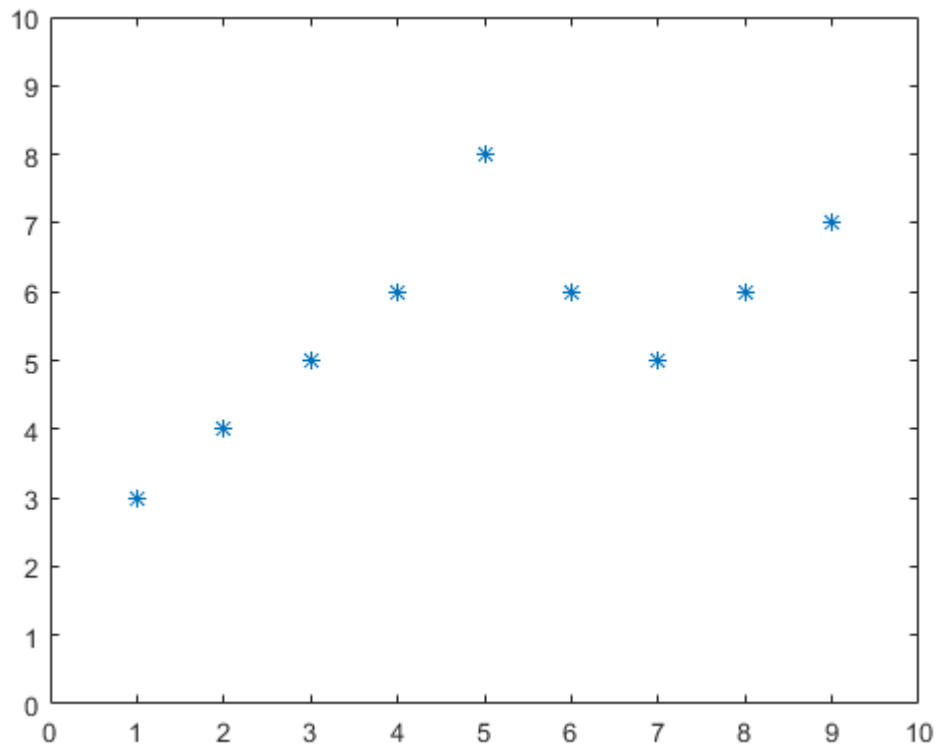
```
ylabel('Pounds')
```

```
plot(b, '*')
```

```
axis([0 10 0 10])
```

Graph:





Eg2:

One area in which MATLAB excels is matrix computation.

Creating a matrix is as easy as making a vector, using semicolons (;) to separate the rows of a matrix.

```
A = [1 2 0; 2 5 -1; 4 10 -1]
```

A = 3×3

```
1  2  0
2  5 -1
4 10 -1
```

```
B = A'
```

B = 3×3

```
1  2  4
2  5 10
0 -1 -1
```

```
C = A * B
```

C = 3×3

5 12 24
12 30 59
24 59 117

C = A .* B

C = 3×3

1 4 0
4 25 -10
0 -10 1

b = [1;3;5]

b = [1;3;5]

b = 3×1

1
3
5

x = A\b

x = 3×1

1
0
-1

r = A*x - b

r = 3×1

0
0
0

eig(A)

```
eig(A)
```

```
ans = 3×1
```

```
3.7321
```

```
0.2679
```

```
1.0000
```

```
svd(A)
```

```
ans = 3×1
```

```
12.3171
```

```
0.5149
```

```
0.1577
```

```
p = round(poly(A))
```

```
p = 1×4
```

```
1 -5 5 -1
```

```
roots(p)
```

```
ans = 3×1
```

```
3.7321
```

```
1.0000
```

```
0.2679
```

```
q = conv(p,p)
```

```
r = conv(p,q)
```

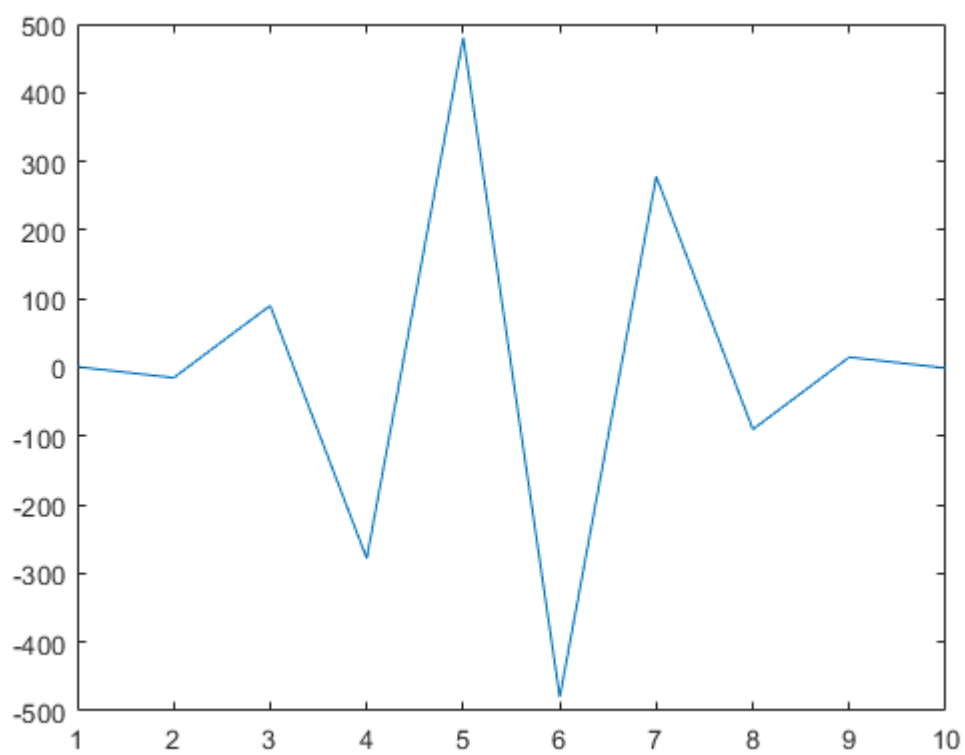
```
r = 1×10
```

```
1 -15 90 -278 480 -480 278 -90 15 -1
```

```
plot(r);
```

```
sqrt(-1)
```

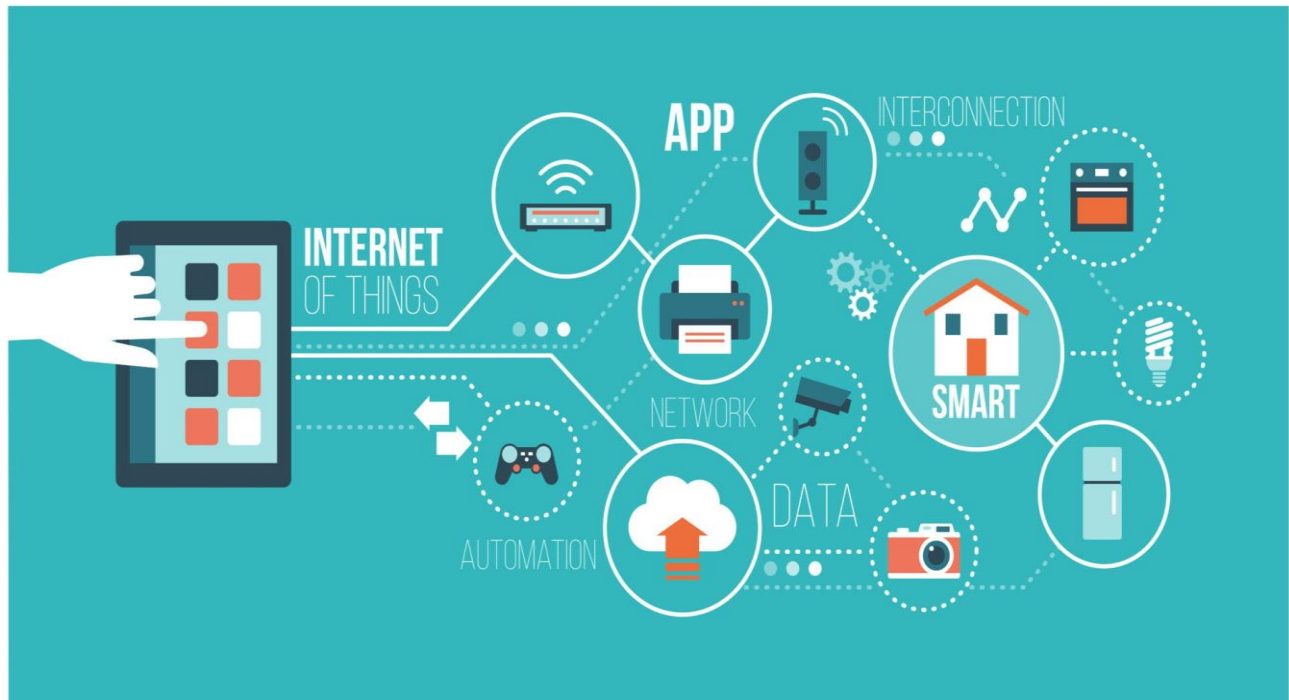
```
ans = 0.0000 + 1.0000i
```



Date:	6 th July 2020	Name:	Soundarya NA
Course:	CISCO	USN:	4AL16EC077
Topic:	Introduction to IOT	Semester & Section:	8 th - B

AFTERNOON SESSION DETAILS

Image of session



Report:

Since IoT allows devices to be controlled remotely across the internet, thus it created opportunities to directly connect & integrate the physical world to the computer-based systems using sensors and internet. The interconnection of these multiple embedded devices will be resulting in automation in nearly all fields and also enabling advanced applications. This is resulting in improved accuracy, efficiency and economic benefit with reduced human intervention. It encompasses technologies such as smart grids, smart homes, intelligent transportation and smart cities. The major benefits of IoT are:

- Improved Customer Engagement – IoT improves customer experience by automating the action. For e.g. any issue in the car will be automatically detected by the sensors. The driver, as well as the manufacturer, will be notified about it. Till the time driver reaches the service station, the manufacturer will make sure that the faulty part is available at the service station.
- Technical Optimization – IoT has helped a lot in improving technologies and making them better. The manufacturer can collect data from different car sensors and analyze them to improve their design and make them much more efficient.
- Reduced Waste – Our current insights are superficial, but IoT provides real-time information leading to effective decision making & management of resources. For example, if a manufacturer finds fault in multiple engines, he can track the manufacturing plant of those engines and can rectify the issue with manufacturing belt.

Now you would be wondering what is the required hardware for preparing an IoT solution. The answer to this question is, you'll first require sensors that will sense the environment, then you require a remote dashboard to monitor your output and display it in a clearer & conceivable form. At last, you will require a device with the capability of serving & routing. The key task of the system would be detecting specific conditions and taking actions accordingly. One thing to keep in mind is securing the communication between the devices and the dashboard.

Some of the common sensors that you are surrounded by are accelerometers, temperature sensors, magnetometers, proximity sensors, gyroscopes, image sensors, acoustic sensors, light sensors, pressure sensors, gas RFID sensors, humidity sensors & micro flow sensors.

Nowadays we also have many wearable devices like smartwatches, shoes & 3D glasses. This is the best example of a smart solution. 3D glasses adjust television's brightness and contrast according to your eye and your smartwatches keeps track of your daily activities and fitness.

But I feel the most important device which has tremendously contributed to IoT are the cell phones. Mobile apps have immensely contributed to revolutionizing the technology world. Cell phones are already encased with applications and sensors that reveals lots of information about its user. It has Geo-location information, it can sense and trace light condition, the orientation of your device and a lot more information. It also comes with multiple connectivity options like Wi-Fi, Bluetooth and cellular that helps them to communicate with other devices. Thus, due to these default qualities of cell phones, it is the core of the IoT ecosystem. Today, Smartphone can interact with smartwatch and fitness band to further ease and enhance the user experience.

IoT uses multiple technologies and protocols to communicate with devices based on the requirements. The major technologies & protocols are Bluetooth, wireless, NFC, RFID, radio protocols and Wi-Fi-Direct.

IoT applications are flourishing across all industries & market. The IoT has a multitude of expansion over various industries. It spans over all groups of users, from those who are trying to reduce & conserve energy in their home to large organizations who want to improve their business operations. IoT has not only proved itself useful in optimizing critical applications in many organisations, but also have boosted the concept of advanced automation which we have imagined a decade before. Let's understand the capabilities of IoT across different industries and look how they are revolutionizing them.

