# DAILY ASSESSMENT FORMAT

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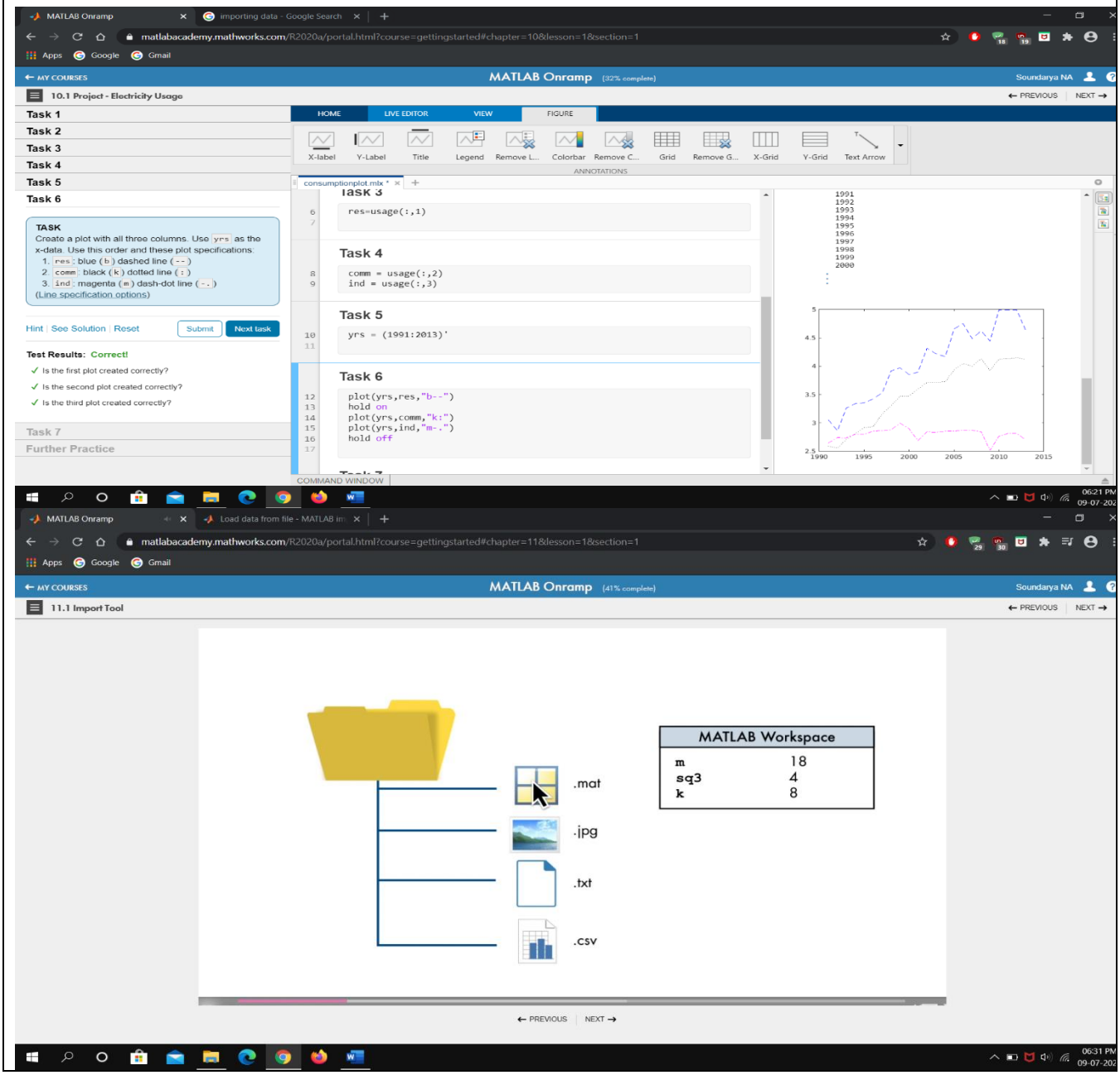
|---|---|---|---|
| **Date:** | 9th July2020 | **Name:** | Soundarya NA |
| **Course:** | Matlab | **USN:** | 4AL16EC077 |
| **Topic:** | Matlab | **Semester & Section:** | 8th - B |
| **Github Repository:** | Soundaryana-courses | | |

## FORENOON SESSION DETAILS

**Image of session**



**Report:**

**Importing Data:**

**Syntax:**

A = importdata(filename)

A = importdata('-pastespecial')

A = importdata(___,delimiterIn)

A = importdata(___,delimiterIn,headerlinesIn)

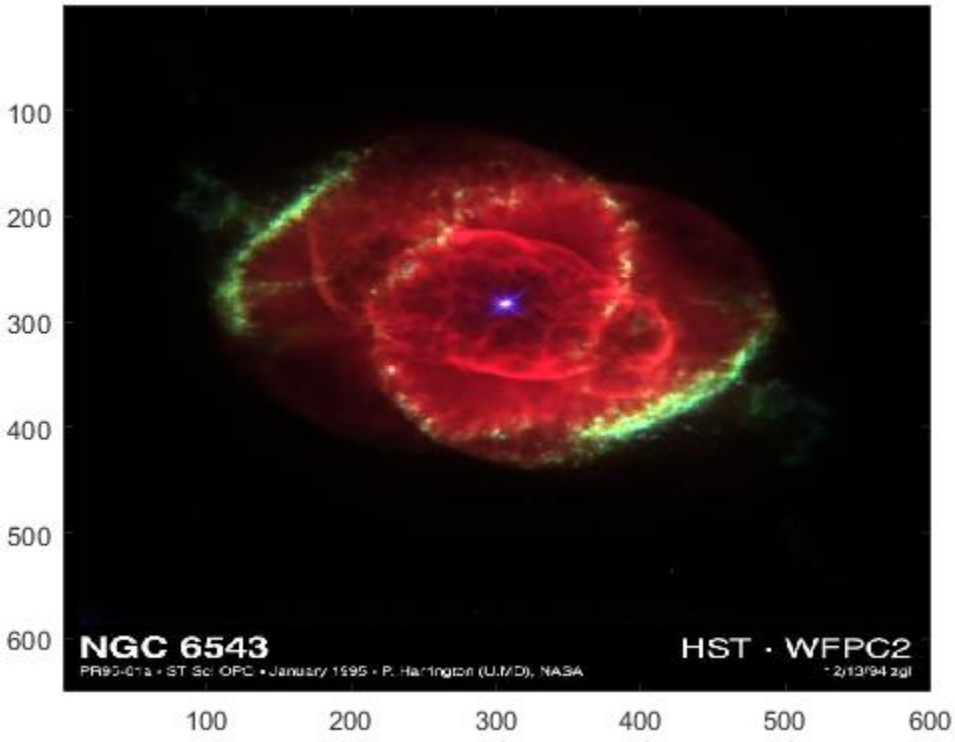
[A,delimiterOut,headerlinesOut] = importdata(___)

**Code:**

```
filename = 'myfile01.txt';
delimiterIn = ' ';
headerlinesIn = 1;
A = importdata(filename,delimiterIn,headerlinesIn);
for k = [3, 5]
  disp(A.colheaders{1, k})
  disp(A.data(:, k))
  disp(' ')
end
filename = 'myfile02.txt';
[A,delimiterOut]=importdata(filename)
A = importdata('-pastespecial')
A =


   1    2    3
   4    5    6
   7    8    9
```

**Output:**




**Logical Arrays:**
**Eg1:**

2>1

2>7

1==2 %test equality

1==1

7<=9

9<=9

ans =1

ans =0

ans =0

Ans=1

ans =1

ans =1

**Eg2:**
1&1 %AND

```
1&0
1|0 %OR
0|0 %OR
~1 %NOT
```

**Eg3:**

```
aa=rand(10,1); %create a 10x1 column vector of random numbers between 0 and 1
aa>0.5
bb=aa>0.5; %we can save this output
cc=rand(10,1)>0.5; %cut out the middle man
ee=(bb==cc) %tests equality element-wise (why isn't every entry 1?)
bb|cc %short circuit OR
ans =
    0
    1
    0
    0
    0
    0
    0
    0
    1
    0
ee =
    1
    0
    0
    0
    1
    0
    1
```

1

1

1

ans =

0

1

1

1

0

1

0

0

1

0

**Working with logics:**

**Eg1:**

any(ee) %test if any of the elements in ee is nonzero

all(ee) %test if all of the element in ee is nonzero

ans = 1

ans =0

**Eg2:**

find(ee)

ans =

1

5

7

8

9

10

**Logical Indexing:**

**Eg1:**

A=randi(50,5,5);

**Eg2:**

A(1:2,3:4)

**Eg3:**

submat=[1 2; 8 16];

A(submat)

**Eg4:**

Aupper=A>=25 %true (1) if the entry in A is greater than or equal to 25, 0 otherwise

A(Aupper)

Aupper =

| | | | | |
|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 1 |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 0 | 1 | 1 |

ans =

26

50

39

38

44

36

30

**The special values:**

**Eg1:**

1/0

-1/0

**Eg2:**

Inf + 2

Inf * 3

Inf / -1

**Eg3:**

isinf(1/0)

isfinite(1/0)

**Eg4:**

0/0

Inf/Inf

**Eg5:**

NaN*1

NaN-1

NaN+NaN

NaN+Inf

**Eg6:**

B=[5 7 9; 10 36 NaN; NaN NaN 4];

**Eg7:**

mean(B) %mean down columns

**Eg8:**

nanmean(B) %works just fine

**Eg9:**

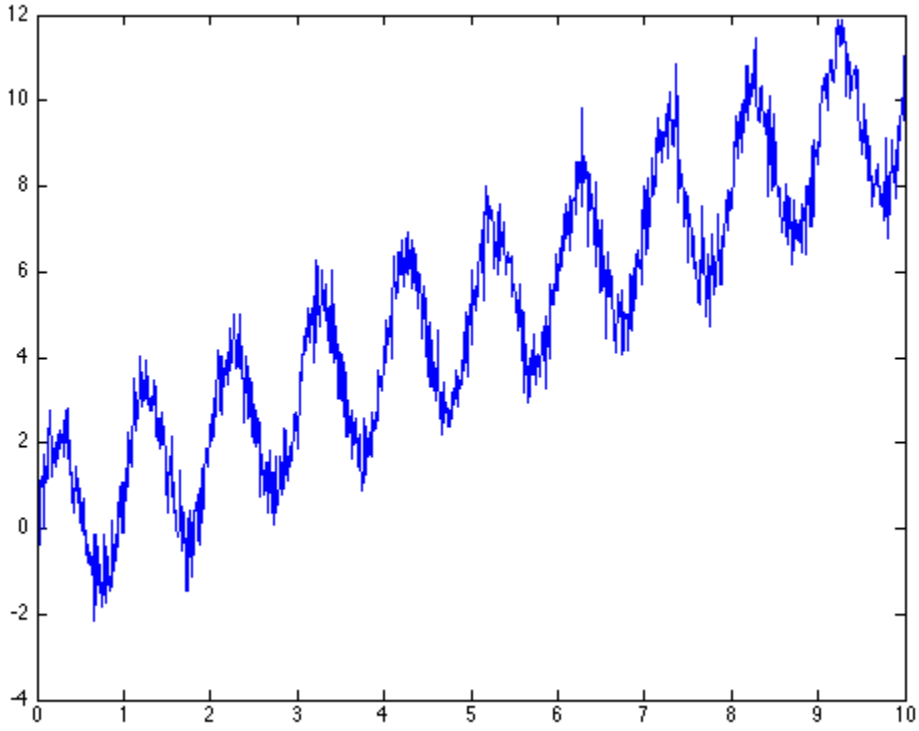
t_axis=0:0.01:10; %define a time axis from 0 to 10 with points every 0.01

y=t_axis+2*sin(2*pi*t_axis)+0.5*randn(size(t_axis)); %look up the commands you don't recognize

**Eg10:**

plot(t_axis,y)

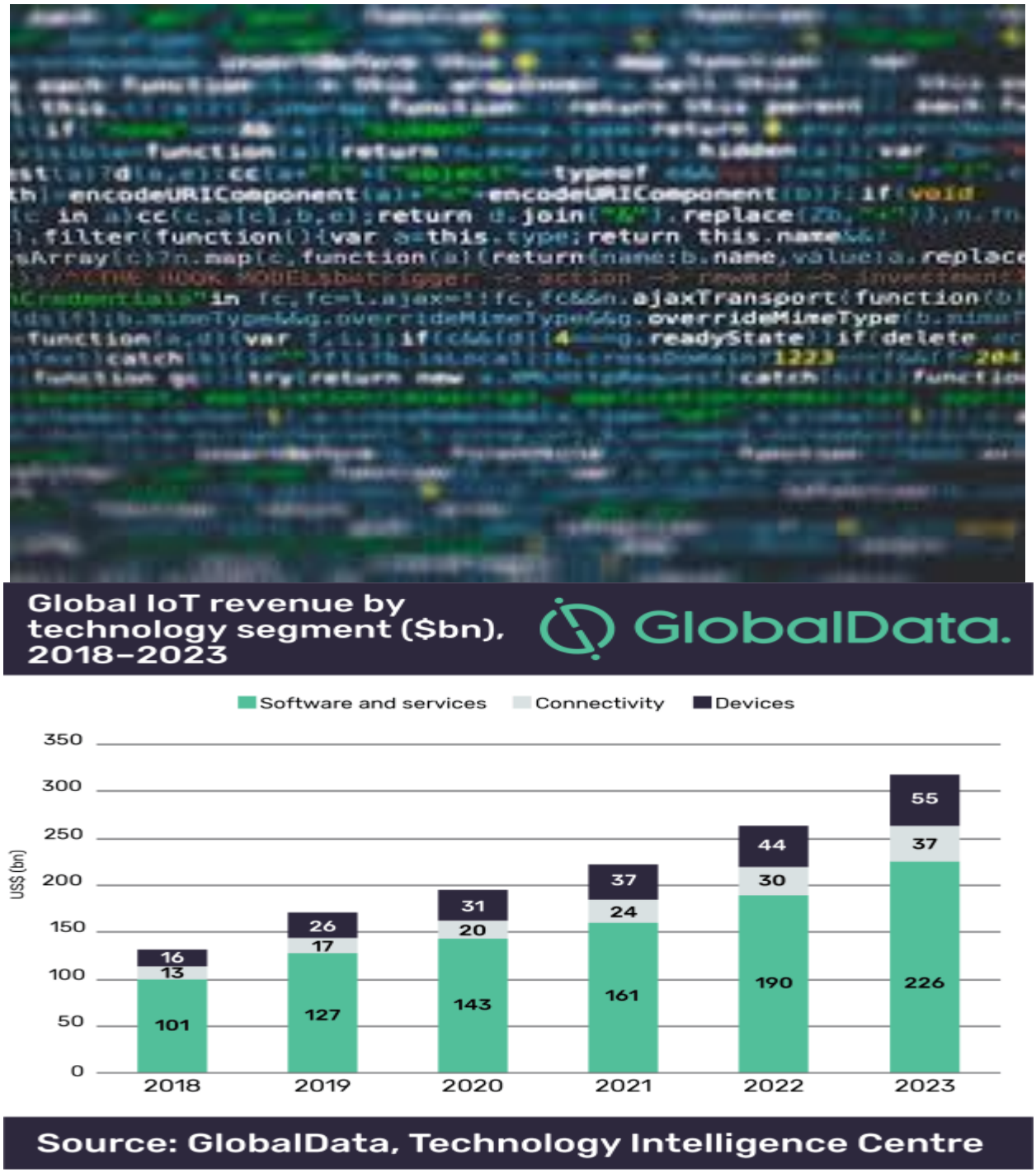
**Output:**


12
10
8
6
4
2
0
-2
-4
0
1
2
3
4
5
6
7
8
9
10

| | | | |
|---|---|---|---|
| **Date:** | 9th July 2020 | **Name:** | Soundarya NA |
| **Course:** | CISCO | **USN:** | 4AL16EC077 |
| **Topic:** | Introduction to IOT | **Semester & Section:** | 8th - B |

**AFTERNOON SESSION DETAILS**

**Image of session**



**Report:**

**How do IOT devices work?**

1. **Sensors:** enables the devices to collect data from the environment surrounding the device (eg. velocity, GPS coordinates, temperature, etc...).
2. **Connectivity:** successively the data collected is sent to the cloud (through either WiFi or Bluetooth connection).
3. **Data Processing:** once the data is received by the cloud infrastructure, it can then be processed (eg. check if the data received adhere to the requirements and if its not alert the user).
4. **User Interface:** Once the data is processed, the results are then given to the and user.

Our IoT device will check if there are any intruders in our house using a Computer Vision system (Sensors). The video recordings of the house are then sent to the cloud to see if there are any intruders or not (Connectivity). Successively, the data is processed in the cloud (Data Processing) and if some intruders are detected we get alerted (User Interface).

An IoT system could be able to alert us in many different ways (eg. phone call/message or App notification) and in some cases we could be able to control remotely the system itself (eg. lock the house doors).

**Google Cloud Internet of Things:**

Google Cloud is currently one of the main Cloud solutions providers on the market. Some of the packages offered by Google Cloud for IoT implementations are:

- **Cloud IoT Core:** is used to set up the device(s) and establish a secure connection between them.
- **Cloud Machine Learning Engine:** it allows users to create Machine Learning models from the data gathered by the IoT devices in order to increase and monitor performances.
- **Cloud Pub/Sub:** provides real time analytics of the IoT devices.

**Azure IOT:**

Microsoft Azure is another really important cloud services provider. Azure is able to deliver both pre-customized and fully customizable solutions. In this way, Azure is able to provide solutions for both beginners and experts in IoT. Microsoft Azure enables to easily scale IoT systems to include devices from different manufacturers and also provides analytics and Machine Learning services support.

**Amazon web services (AWS):**
AWS is one of the most popular solution for cloud-based services. AWS can enable to perform IoT projects from end to end and making use of the four following packages:

1. **AWS IoT Core:** is the basic package which can be used to set up IoT devices. Using IoT Core we can integrate different devices to communicate each other over a secured connection making possible to exchange data through cloud storage.
2. **AWS IoT Analytics:** is used to process and analyse all the data produced by IoT devices. Once all the data is stored using a semi-structured format (eg. JSON, CSV) it can be then used for Machine Learning purposes (eg. monitor and optimise the interaction between IoT devices).
3. **AWS IoT Device Defender:** is used to construct and personalise the security mechanisms of IoT devices (such as choosing device authentication and data encryption).
4. **AWS IoT Device Management:** enables to easily integrate new IoT devices to an environment and monitor/update their functionalities.

Internet of Things devices are definitely going to play a really important role in future technology advancements. Although there are still the same issues that have to be addressed. In fact, one of the main concerns about IoT devices can be cyber-security.

Because most IoT devices make use of a cloud center to store their data and to collect useful information from the internet, that makes them vulnerable from Hackers attacks (creating a single point of failure).

In order to resolve this problem, could be either possible to increase the encryption standards (slowing down the transfer of data) or makes use of Artificial Intelligence security powered techniques such as Differential Privacy and Federated Learning.

In case a Hacker would be able to access control of an IoT device (or an entire group) there would be two main risks associated with it:

- The Hacker would be able to access and steal sensitive data of the IoT device users
- The Hacker could be able to take remote control of the device itself