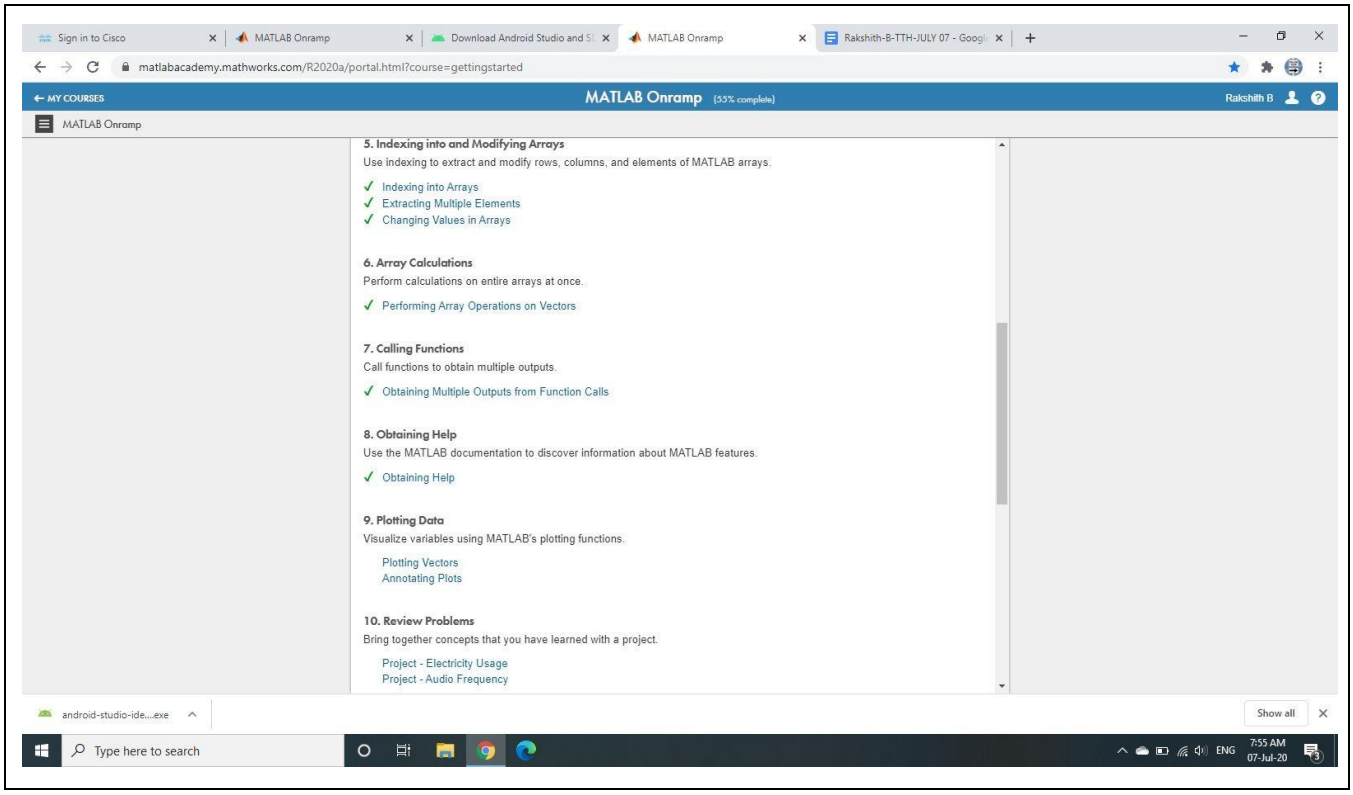
REPORT JULY 07

Date:	**07 JULY 2020**	**Name:**	**Poorvi hj**
Course:	**Matlab**	**USN:**	**4AL16EC4071**
Topic:	**Indexing into and Modifying Arrays,Array Calculations.**	**Semester & Section:**	**6th SEM B**
Github Repository:	**Poorvi-2000**		

Image of the Session



Report:

For long vectors, entering individual numbers is not practical. An alternative, shorthand method for creating evenly-spaced vectors is to use the : operator and specify only the start and end points.

y = 5:8

y =

5 6 7 8

Notice that square brackets are not needed when you use the colon operator.

The size function can be applied to an array to produce a single output variable containing the array size.

s = size(x)

If you only need the second output from a function, you can use a tilde (~) to ignore specific outputs.

For example, you might only want the index containing the maximum value in a vector: density =

data(:,2)

[~,ivMax] = max(v2) densityMax

= density(ivMax)

Try getting the index value of the minimum value in v2. Use this index to extract from density

.

The MATLAB documentation contains examples and information that can help you when working on your own problems.

Two vectors of the same length can be plotted against each other using the plot function.

plot(x,y)

Date:	**07 JULY 2020**	**Name:**	**Poorvi hj**
Course:	**Cisco**	**USN:**	**4AL16EC409**
Topic:	**Introduction to IOT**	**Semester & Section:**	**6th SEM B**
Github Repository:	**Poorvi-2000**		

Image of the session:

Report

This Introduction to Internet of Things 2.0 course is designed for people wishing to explore the Internet of Things and the impact it has on our everyday lives. It is not the intention of this course to teach about the IoT in depth but to provide a general understanding of the IoT and how it allows for digitization of daily tasks.

To learn more, we encourage you to enroll in additional Cisco networking and IT related courses at your institution. Other IoT courses you may be interested in include: Connecting Things, Big Data and Analytics, and IoT Security. You may also be interested in CCNA and Cybersecurity courses provided by the Cisco Networking Academy.

The Cisco Networking Academy Facebook site is where you can meet and engage with other Networking Academy students from around the world. You may be able to receive peer to peer support if you have questions about the curriculum.

All quizzes and assessments can be accessed through the Modules **section of the course.**

Click the Next button to go to the resources and support page.

The Evolution of Digital Transformation

Tell the truth …. how many of you could actually make it through a day without your smartphone?

In our world today, there are more smart devices than there are people. A growing number of people are connected to the Internet, in one way or another, 24 hours a day. An ever-increasing number of people have, and rely on, three, four, or more smart devices. These might include smartphones, exercise and health monitors, e-readers, and tablets. As shown in Figure 1, by 2020, it is forecast that each consumer will have an average of 6.58 smart devices.

How is it possible for so many devices to be connected?

Modern digital networks make all of this possible. The world is quickly being covered with networks that allow digital devices to interconnect and transmit. Think of the mesh of networks

like a digital skin surrounding the planet, as illustrated in Figure 2. With this digital skin, mobile devices, electronic sensors, electronic measuring devices, medical devices, and gauges are all able to connect. They monitor, communicate, evaluate, and in some cases automatically adjust to the data that is being collected and transmitted.

As society embraces these digital devices, as digital networks continue to grow around the world, and as the economic benefits of digitization continue to grow, we are seeing a digital transformation. Digital transformation is the application of digital technology to provide the stage for business and industry to innovate. This digital innovation is now being applied to every aspect of human society.

Modern networks can be a bit confusing. There are many types that are characterized by their geographic size, by the number of devices or networks that they connect, and by whether they support mobile devices or not. Networks can also be characterized by their function and purpose.

Personal Area Network (PAN)

Personal area networks are small networks where connected wireless devices are within personal reach (Figure 1). Connecting your smartphone to your car using Bluetooth is an example of a PAN.

Local Area Network (LAN)

LANs are typically networks in a small or local geographic area, such as a home, small business or department within a large corporation (Figure 2). LANs can connect two or more devices, including computers, printers, and wireless devices. LANs provide access to larger wide area networks (WANs) and the Internet.

Wide Area Networks (WANs)

The term WAN typically refers to a collection of LANs that provides inter-LAN and Internet connectivity for businesses and governments.

Internet The Internet is a multi-layer global network system that connects hundreds of millions of computers (Figure 3). The Internet is not owned by any one person or organization. This large system comprises multiple local and global networks serving private, public, business, academic, and government purposes. It allows for the exchange of data between more than a hundred Internet-linked countries worldwide. This makes the Internet an enormous carrier of various information resources and services. Some of these include text and multimedia data, email, online chat, VoIP, file transfer and file sharing, ecommerce, and online gaming.

Wireless Networks

Wireless networks are those computer networks that use electromagnetic waves instead of wires in order to carry signals over the various parts of the network. Wireless networks can be described as PANs, LANs or WANs, depending on their scope.

Because browsing the Internet is considered a normal daily activity, wireless access points have become commonplace in the communication infrastructure today. Public Internet-connected places include libraries, airports, coffee shops, hotels, and specialized Internet cafes. Thanks to Wi-Fi technology, the Internet can now be accessed by every person with a laptop, tablet, or

smartphone. Figure 4 shows the different categories of wireless networks that are available.

The Cloud

The term "cloud" is used in many different ways. The cloud is not as much a type of network as it is a collection of data centers or groups of connected servers that are used to store and analyze data, provide access to on-line applications, and provide backup services for personal and corporate use (Figure 5). Cloud services are provided by different organizations.

The Edge

The edge refers to the physical "edge" of a corporate network.

Fog Computing

With the rising number of sensors used by the Internet of Things, there is often a need to store the sensor data securely and closer to where the data can be analyzed. This analyzed data can then be used quickly and effectively to update or modify processes within the organization. Figure 6 shows an example of a smart city and how sensor data is processed. The fog is located at the edge of a business or corporate network. Servers and computer programs allow the data to be pre-processed for immediate use. Then the pre-processed data can be sent to the cloud for more in-depth computing if required.

Python is an interpreted language; therefore, an interpreter is required to parse and execute Python code. The Python interpreter understands and executes Python code. Python code can be created in any text editor and Python interpreters are available for many operating systems. Python developers can create and deploy Python programs in practically any operating system. Third party tools such as Py2exe and Pyinstaller can also be used to package the Python source code into an executable file, eliminating the need for the Python interpreter when running Python code.

In Linux machines, the Python interpreter is usually installed in /usr/bin/python or /usr/bin/python3 (depending on the available Python versions on the system). With the new Windows Python installer, Python is installed by default into the user's home directory. In older Windows machines, Python is often placed in C:\PythonXX (where XX is the version of Python). After the Python interpreter has been installed, it operates somewhat like the Linux shell. This means that when called with no arguments, it reads and executes commands interactively. When called with a file name argument or with a file as standard input, it reads and executes a script from that file.

To start the interpreter, simply type python or python3 at the shell prompt.

Some legacy systems are still running on an older version of Python 2, but many new systems are moving to use the new Python version 3. Python's version is printed on the first line when the interpreter is launched (Figure 1). This course is built on Python 3 code.

When the Python interpreter is called with no arguments, and commands are entered via the keyboard, the interpreter is said to be in interactive mode. In this mode, the interpreter waits for commands. The primary prompt is represented by three greater-than signs (>>>). Continuation lines are represented by three dots (...). Continuation is the default secondary prompt.

The >>> prompt indicates the interpreter is ready and waiting commands.

Continuation lines are needed when entering multi-line code. Figure 2 shows an IF-THEN block written in Python.

Another way of using the interpreter is python -c command [arg] ... which executes the statement(s) in the command. Because Python statements often contain spaces or other characters that are particular to the shell, it is suggested to enclose the entire command between single quotes.

What Is Intent-Based Networking (IBN)

For a business to survive, it must be agile and respond quickly to the needs and demands of its customers. Businesses are increasingly dependent on their digital resources to meet customer demands, so the underlying IT network must also be responsive enough to quickly adapt to these requirements. This normally involves adjustments to many systems and processes. These adjustments may include changes to security policies and procedures, business services and applications, and operational policies.

With traditional networks, many different components must be manually adjusted to meet ever-changing business requirements. This requires different technicians and engineers to ensure that the systems are changed in a manner that allows them to work together to accomplish their goal. This sometimes results in errors and delays, and often in sub-optimal network performance.

The new business network must seamlessly and securely integrate IoT devices, cloud-based services, and remote offices in an agile, responsive, and business-relevant manner. Additionally, the network must secure these new digital initiatives from the ever-changing threat landscape.

To address this need, the IT industry has initiated an effort to create a systematic approach to tie infrastructure management to business intent. This approach is known as intent-based networking. The figure illustrates the general idea behind intent-based networking. With this new paradigm, business needs are automatically and continually translated into IT infrastructure execution.

Click her e for information about Cisco Intent-based networking.

How are ML, AI, and IBN Linked?

Intent-based networking harnesses the power of automation, AI, and ML to control the function of a network to accomplish a specific purpose, or intent.

Intent-based networking allows the IT team to specify, in plain language, exactly what they want the network to accomplish and the network makes it happen. The network is able to translate the intent into policies and then use automation to deploy the appropriate configurations required across the network.

The intent-based network uses AI and ML to ensure that any services that are deployed meet the

required service level. If they do not meet the service level, the intent-based network can make alerts and provide suggestions for improvement. In some cases, the intent-based network can automatically reconfigure the network to comply with the service levels.

The intent-based networking model shown in the figure consists of three key elements:

- **Assurance - The assurance element is end-to-end verification of network-wide behavior. It predicts the results of any changes, tracks compliance with the original intent, and makes recommendations or adjustments when there is a misalignment between the intent and the outcome. This stage relies heavily on AI and ML. Systems are part of a closed-loop that continually monitors performance and security of the network, and reconfigures the network to ensure compliance.**
- **Translation - The translation element is the ability to apply business intent to network configuration. The intent is what you wish to accomplish, not how it is accomplished. This intent is specified in plain language and used by the system to create policies across the system. For example, an intent might be to segment guest traffic from corporate traffic, or to enable access for remote users.**
- **Activation - The activation element occurs after the intent has been specified and the policies created. This is when individual devices are provisioned to match the intent-based policies. This can be an automated or semi-automated mode that allows the network team to verify configuration before the devices are deployed.**

An intent-based network creates an agile, responsive network that scales easily and adapts to meet business requirements. It makes efficient use of highly-skilled resources and allows man and machine to work together to optimize the customer experience. Additionally, intent-based networking provides a more secure digital experience by automating time consuming or complicated processes. This makes deploying security policies much easier.

For more information and free training on intent-based networking visit the Cisco Learnin g Network.