**DAILY ASSESSMENT FORMAT**

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| **Date:** | **06-07-2020** | **Name:** | **Karthik J** |
| **Course:** | MATLAB Onramp from MathWorks | **USN:** | **4AL16EC030** |
| **Topic:** | Commands, MATLAB Desktop and Editor, Vectors and Matrices | **Semester & Section:** | **8TH A** |
| **GitHub Repository:** | Karthik-J |  |  |

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| **FORENOON SESSION DETAILS** |
| **Image Section**   **Basic MATLAB Commands** MATLAB is designed to work with matrices, where a matrix is defined to be a rectangular array of numbers. All variables used are considered to be matrices. Scalars and vectors can be used since they can be considered as matrices with dimension 1×1 (scalars) and 1xn or nx1 (vectors).  Unlike programming languages such as C or Java, MATLAB does not require any type declarations or dimension statements. When MATLAB encounters a new variable name, it automatically creates the variable and allocates the appropriate amount of storage. If the variable already exists, MATLAB changes its contents and, if necessary, allocates new storage. To check to see what variables already exist and what dimensions they are, type the command whos at the prompt. To clear existing variables from memory enter the command clear at the prompt.  To create a variable, simply type the variable name at the prompt, followed the the equals sign (=), and followed by the initialization, as demonstrated below:  To initialize a scalar a: >>a=[2]  To initialize a row vector b: >>b=[1 2 3 4 5] Note that spaces between numbers signify a new column.  To initialize a column vector c: >>c=[6; 7; 8; 9] Note that semicolons between numbers signify a new row.  To initialize a 3 by 3 matrix M: >>M=[1 2 3; 4 5 6; 7 8 9] Again, spaces between numbers signify a new column, whereas semicolons signify a new row.  Note: Although not required by MATLAB, linear algebra conventions of naming matrices with capital letters and scalars/vectors with lower case letters is often retained for readability inside MATLAB. **Generating Matrices** MATLAB provides four functions that allow you to easily generate basic matrices.   * The zeros function creates a matrix with all elements equal to zero. For example, to create a 3 by 4 zero matrix Z:   >>Z= zeros(3, 4)   * The ones function creates a matrix with all elements equal to one. For example, to create a 2 by 3 ones matrix O:   >>O= ones(2, 3)   * The rand function creates a matrix with uniformly distributed random elements. For example, to create a 4 by 1 random matrix R:   >>R= rand(4, 1)   * The randn function creates a matrix with normally distributed random elements. For example, to create a 2 by 5 random matrix R:   >>R= randn(2, 5)   |  |  |  |  | | --- | --- | --- | --- | | **Date:** | **06-07-2020** | **Name:** | **Karthik J** | | **Course:** | Cisco Networking Academy | **USN:** | **4AL16EC030** | | **Topic:** | Introduction to IoT | **Semester & Section:** | **8TH A** | | **GitHub Repository:** | Karthik-J |  |  |      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. What is the IoT? The Internet of Things (IoT) is the connection of millions of smart devices and sensors connected to the Internet. These connected devices and sensors collect and share data for use and evaluation by many organizations. These organizations include businesses, cities, governments, hospitals and individuals. The IoT has been possible, in part, due to the advent of cheap processors and wireless networks. Previously inanimate objects such as doorknobs or light bulbs can now be equipped with an intelligent sensor that can collect and transfer data to a network.  Researchers estimate that over 3 million new devices are connected to the Internet each month. Researchers also estimate that in the next four years, there are going to be over 30 billion connected devices worldwide.  Perhaps a third of connected devices will be computers, smartphones, tablets, and smart TVs. The remaining two-thirds will be other kinds of “things”: sensors, actuators, and newly invented intelligent devices that monitor, control, analyze, and optimize our world.  Some examples of intelligent connected sensors are: smart doorbells, garage doors, thermostats, sports wearables, pacemakers, traffic lights, parking spots, and many others. The limit of different objects that could become intelligent sensors is limited only by our imagination. Summary The world is quickly being covered with networks which allow digital devices to interconnect and transmit. 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.  Sensors are now everywhere, collecting and transmitting massive amounts of data. The generated data can be stored and analyzed at a later date, or it can be analyzed and used immediately. Sensors can be in the home, on traffic lights, in farm fields, and on our bodies. The analyzed data is used by governments, cities, businesses, and individuals to effect changes such as monitoring the environment, forecasting population growth, controlling waste management, or securing a home.  Networks form the foundation of the digitized world. There are many types of networks 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.   * PAN: Bluetooth * LAN * WAN: Internet, the cloud, fog computing * Wireless: Wi-Fi, Cellular   A sensor typically connects to a controller using a wireless connection. Controllers collect data from sensors and send the data for storage or analysis. Controllers may have the ability to make immediate decisions, or they may work together with a device called an actuator. Actuators take electrical input and transform the input into physical action.  Networks are now connecting billions of sensors and have the ability to make changes to physical environments without human intervention. The future of networking will revolve around artificial intelligence (AI) and intent-based networking (IBN). If programmed appropriately, smart devices are able to evaluate data that is provided to them and modify processes or settings. If they are provided with sufficient data, they can “learn” and modify their own code based on the new parameters. |