**ASSESSMENT 41**

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| **Date:** | 06-07-2020 | **Name:** | Sheela Golasangi |
| **Course:** | Matlab Onramp | **USN:** | 4AL16EC068 |
| **Topic:** | Course Overview Commands  MATLAB Desktop and Editor  Vectors and Matrices | **Semester & Section:** | VIII  ‘B’ |
| **Github Repository:** | Sheela-Course |  |  |

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| **FORENOON SESSION DETAILS** |
| **REPORT**:  C:\Users\india\Downloads\WhatsApp Image 2020-07-06 at 10.24.22 PM (1).jpeg  C:\Users\india\Downloads\WhatsApp Image 2020-07-06 at 10.24.22 PM.jpeg  MATLAB (matrix laboratory) is a multi-paradigm numerical computing environment and proprietary programming language developed by MathWorks. MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages. Although MATLAB is intended primarily for numerical computing, an optional toolbox uses the MuPAD symbolic engine allowing access to symbolic computing abilities. An additional package, Simulink, adds graphical multi-domain simulation and model-based design for dynamic and embedded systems. MATLAB is an interactive program for numerical computation and data visualization. We can enter a command by typing it at the MATLAB prompt '>>' on the Command Window. Lists of commonly used general MATLAB commands. MATLAB provides various commands for managing a session.  WHAT IS MATLAB?  It is abbreviated as Matrix-based language, has been designed for computer scientists and engineers. Matlab provides great solutions in computational mathematics.  It can be used for –   1. Data analysis 2. Algorithm development 3. Create models and application   Matlab finds a great use case in machine learning and deep learning as they deal with n-dimensional space which can be represented and analyzed in the matrix form only. Apart from this other technologies using this are control system design, image processing, and computational finance.  Matlab Cammands  Matlab provides the commands that are used while the user has to interact with the application using the command line interface. Here we will see how to use those commands with the help of examples   * Basic Cammands   **1. Clear** – This command removes variables from the memory  **2. Exist** – This command checks for the existence of a variable  **3. Clc** – This command clears the command window  **4. Global** – This command declares a variable as global  **5. Help** – If you need to search for any help just write the keyword at command window and it displays your available options  **6. Who** – This command lists the current variable  **7. Type** – This command displays the contents of a file.  **8. Pwd** – This command displays the current directory.  **9. Date** – This command displays the current date  **10. What** – This command lists all the Matlab files in the current directory  **Example 1:**  Matlab Commands Example 1  **Example 2:**  Matlab Commands Example 2  **Example 3:**  Matlab Commands Example 3   * **Intermediate MATLAB Cammands**   Below are the intermediate commands which are as follow   1. **Mathematical Functions**   Here we are exploring plot command which is being used to plot the sinusoidal wave curve with time, where time is ranging from 1 to 30 and is increasing in intervals of 0.01.  In a similar way, we can do this for any other trigonometric function too which constitutes the major part of mathematics  Mathematical Functions   1. **Array Related Cammands**  * **Cat–**It is used to concatenate two arrays, the first argument it takes is a dimension of the array to be created like whether it is 1D,2D or n-dimensional array and thereafter that n-number of arrays are passed as arguments, those are to be concatenated as shown in the snapshot * **Length –** Computes the number of elements in the array * **Min, max –**These commands return the max and min elements present in the arrays.   Array related   1. **Matrix Related Cammands**  * **Eye –**This creates an identity matrix * **Ones –**This creates the array of ones * **Zeros**– This creates the array of zeros   Matrix Related   1. **Matrix Arithmatic Cammands**  * **Dot-**This command generates the dot product of two matrices, note that the columns and rows of matrix decide the resulting matrix creation * **Cross** – Synonymously this creates the cross product, helpful in vector operations when represented in the matrix form   Matrix Arithmetic   1. **Matrix Commands For linear equation related operations**   **Rank –**This command provides the result to an important mathematical parameter of matrices called rank which is the quantification of the lowest order of non-zero determinant carrying sub-matrix in the parent matrix   * **Det –**Determinant of the matrix is calculated using this command. * **Inv –** Execution of this command provides us the inverse of a matrix.   Timing related commands   1. **Timing Related Cammands**   **Cputime**– Calculates the CPU time in seconds  CPU time   1. **String Related Cammands**  * **Findstr –**Finds occurrences start index of a String in a phrase. * **Strcmp –**This command is used to compare two strings, returns 1 if the match is correct else it returns 0.   String Related commands  **Advance MATLAB Cammands**  let’s take a look at some of the Advanced commands which are as given below:-   * 1. **Contour**   Whenever you are dealing in control system designs in engineering, the Nyquist plot contours, etc give you a mark of the stability in the system, we can customize the style of the plot in the Matlab (like the color and line type, etc).  Contour  **2. Polynomial Related Cammands:**   * **Poly2sym(vector) –**This command converts a vector of coefficients into the corresponding symbolic polynomial (from highest to lowest power). * **poly2sym(vector, ‘v’) –**This command converts a vector of coefficients into the corresponding symbolic polynomial inv (from highest to lowest power).   Polynomial related commands  **3. Cammands for Equation Solving**  **syms x1 x2…xn; solve(eq1,eq2,…,eqn, x1, x2,…,xn) –** This command solves the simultaneous n number of equations and the solutions against those are assigned to variables ranging from x1,x2 to xn.  The below attached image carries the demonstration  Commands for Equation solving4. Commands for solving the Linear System of Equations  **X = linsolve (A, B) –** Let us suppose that we need to find a solution against the given equation  2x+y+z+m=1  x+2y+z+m=2  x+y+2z+m=3  x+y+z+2m=4  This can be solved in accordance with the attached image  Commands for solving the Linear System of Equations  **Tips and Tricks to use Cammands**   * A programmer shall be aware of use cases like when does Matlab do in-place calculations. * Use flexible indexing when dealing with tables * Write Matlab functions with flexible calling Syntax   Example –  We are supposed to design a function with given syntax  function a = findArea(width,margin) % findArea(width) % findArea(width,height) % findArea(... 'shape',shape)  so here, by use of inputParser, you can specify which input arguments are required (width), which are optional (height), and which are optional name-value pairs (‘shape’). inputParser also lets you confirm that each input is valid  As inputParser is a MATLAB object. Make sure to first create an object and then call functions to add the various input arguments.  **Conclusion:**  MATLAB is a platform for scientific calculation and high-level programming which uses an interactive environment to perform complex calculations more efficiently than with traditional languages, such as C and C++.  Has supporting modules for multiple operations, has integration with Simulink which can be used for simulating the electronic control systems, do the complex computations related to numerical methods, digital signal processing, image processing, and video processing. |

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| **Date:** | 06-07-2020 | **Name:** | Sheela Golasangi |
| **Course:** | Cisco Certification Course: Introduction to  Internet of Things | **USN:** | 4AL16EC068 |
| **Topic:** | Everything is Connected | **Semester & Section:** | VIII  ‘B’ |
| **Github Repository:** | Sheela-Course |  |  |
| **AFTERNOON SESSION DETAILS** | | | |
| **C:\Users\india\Pictures\Screenshots\Screenshot (1073).png**  **C:\Users\india\Pictures\Screenshots\Screenshot (1070).png**  **C:\Users\india\Pictures\Screenshots\Screenshot (1081).png**  The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. An internet connection is a wonderful thing, it give us all sorts of benefits that just weren’t possible before. If you’re old enough, think of your cell phone before it was a smartphone. You could call and you could text, sure, but now you can read any book, watch any movie, or listen to any song all in the palm of your hand. The point is that connecting things to the internet yields many amazing benefits. We’ve all seen these benefits with our smartphones, laptops, and tablets, but this is true for everything else too. And yes, we do mean everything. The Internet of Things is actually a pretty simple concept, it means taking all the physical places and things in the world and connecting them to the internet. Confusion arises not because the concept is so narrow and tightly defined, but rather because it’s so broad and loosely defined. It can be hard to nail down the concept in your head when there are so many examples and possibilities in IoT. The Internet of Things may be a hot topic in the industry but it’s not a new concept. In the early 2000’s, Kevin Ashton was laying the groundwork for what would become the Internet of Things (IoT) at MIT’s AutoID lab. Ashton was one of the pioneers who conceived this notion as he searched for ways that Proctor & Gamble could improve its business by linking RFID information to the Internet. The concept was simple but powerful. If all objects in daily life were equipped with identifiers and wireless connectivity, these objects could be communicate with each other and be managed by computers. In a 1999 article for the RFID Journal Ashton wrote: “If we had computers that knew everything there was to know about things—using data they gathered without any help from us -- we would be able to track and count everything, and greatly reduce waste, loss and cost. We would know when things needed replacing, repairing or recalling, and whether they were fresh or past their best. We need to empower computers with their own means of gathering information, so they can see, hear and smell the world for themselves, in all its random glory. RFID and sensor technology enable computers to observe, identify and understand the world—without the limitations of human-entered data.”1 At the time, this vision required major technology improvements. After all, how would we connect everything on the planet? What type of wireless communications could be built into devices? What changes would need to be made to the existing Internet infrastructure to support billions of new devices communicating? What would power these devices? What must be developed to make the solutions cost effective? There were more questions than answers to the IoT concepts in 1999. Today, many of these obstacles have been solved. The size and cost of wireless radios has dropped tremendously. IPv6 allows us to assign a communications address to billions of devices. Electronics companies are building Wi-Fi and cellular wireless connectivity into a wide range of devices. ABI Research estimates over five billion wireless chips will ship in 2013.2 Mobile data coverage has improved significantly with many networks offering broadband speeds. While not perfect, battery technology has improved and solar recharging has been built into numerous devices. There will be billions of objects connecting to the network with the next several years. IoT describes a system where items in the physical world, and sensors within or attached to these items, are connected to the Internet via wireless and wired Internet connections. These sensors can use various types of local area connections such as RFID, NFC, Wi-Fi, Bluetooth, and Zigbee. Sensors can also have wide area connectivity such as GSM, GPRS, 3G, and LTE. | | | |