# DAILY ASSESSMENT

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| Date: | 6/07/2020 | Name: | Chesmi B R |
| Course: | **Matlab from mathworld** | USN: | 4AL16EC100 |
| Topic: | **Course overview, commands, MATLAB Desktop and Editor, vectors and matrices** | Semester & Section: | 8TH SEM & A Section |
| Github Repository: | chesmibr |  |  |

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| **FORENOON SESSION DETAILS**     Report: 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 Commands 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 Commands **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  **Example 4:**  Matlab Commands Example 4  **Example 5:**  Matlab Commands Example 5  So if you would clearly observe the example 5 presented above, you can see that the statements hold true and in the last example we called clear command first and thereafter we looked for a type of x and y which now came to be undefined but was not so in example 4.  Note that these examples have been presented with octave that is open source and equivalent platform to Matlab and uses the same command set. Intermediate Matlab Commands Below are the intermediate commands which are as follows: 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 ****2.****Array related Commands  * **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 3. Matrix Related Commands  * **Eye –**This creates an identity matrix * **Ones –**This creates the array of ones * **Zeros**– This creates the array of zeros   Matrix Related 4. Matrix Arithmetic Command  * **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.  6. Timing related commands Timing related commands  **Cputime**– Calculates the CPU time in seconds  CPU time 7. String Related commands  * **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 Advanced Matlab Commands 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 commands  * **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. Commands 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 commands  * 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++.](https://www.educba.com/c-vs-c-plus-plus/)  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:** | **6/07/2020** | **Name:** | **Chesmi B R** |
| **Course:** | **Cisco certification:IOT** | **USN:** | **4AL16EC100** |
| **Topic:** | **Chapter 1 and 2** | **Semester & Section:** | **8TH SEM & A Section** |
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| **AFTERNOON SESSION DETAILS** |
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| **Report**-  The Internet of Things, or "IoT" for short, is about extending the power of the internet beyond computers and smartphones to a whole range of other things, processes, and environments. Here's everything you need to know. We all know that IoT is changing industries across the board – from agriculture to healthcare to manufacturing and everything in between – but what is IoT, exactly? Working for an Internet of Things (IoT) company, I get asked that question all the time and, over that time, I’ve worked hard to boil it down to something anyone can understand. Here’s everything you need to know about the internet of things. “What is IoT?” If you just Google “what is IoT?”, many of the answers are unnecessarily technical. Case in point:  **“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 unnecessarily technical explanation of IoT  If you just read that and thought, “ok…what?”, you’re not alone. Most people neither want nor to need to dive into the nitty-gritty of IoT. So in this post, I’ll provide you with a simple explanation of the Internet of Things and how it may impact you. This can also serve as a resource to share with others who need an introduction to IoT (like friends, family members, or customers).  Before we jump in, note that “The Internet of Things” and “IoT” can and will be used interchangeably. And a quick tip: avoid saying “the IoT.” The Internet of Things (IoT) Explained: Simply and Non-Technically How are you reading this post right now? It might be on desktop, on mobile, maybe a tablet, but whatever device you’re using, it’s most definitely connected to the internet.  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 cellphone 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. And that’s just to name a few of the incredible things your smartphone can do.  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, I do mean everything.  The Internet of Things is actually a pretty simple concept, **it means taking all the things in the world and connecting them to the internet**.  I think that 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.  To help clarify, I think it’s important to understand the benefits of connecting things to the internet. Why would we even want to connect everything to the internet? Why IoT Matters When something is connected to the internet, that means that it can send information or receive information, or both. This ability to send and/or receive information makes things smart, and smart is good.  Let’s use smartphones (**smart**phones) again as an example. Right now you can listen to just about any song in the world, but it’s not because your phone actually has every song in the world stored on it. It’s because every song in the world is stored somewhere else, but your phone can send information (asking for that song) and then receive information (streaming that song on your phone).  To be smart, a thing doesn’t need to have super storage or a supercomputer inside of it. All a thing has to do is connect to super storage or to a supercomputer. Being connected is awesome.  In the Internet of Things, all the things that are being connected to the internet can be put into three categories:   1. Things that collect information and then send it. 2. Things that receive information and then act on it. 3. Things that do both.   And all three of these have enormous benefits that feed on each other. 1. Collecting and Sending Information [This means sensors.](https://www.iotforall.com/what-are-wireless-iot-sensors-why-are-they-useful/) Sensors could be temperature sensors, motion sensors, moisture sensors, air quality sensors, light sensors, you name it. These sensors, along with a connection, allow us to automatically collect information from the environment which, in turn, allows us to make more intelligent decisions.  On the farm, automatically getting information about the soil moisture can tell farmers exactly when their crops need to be watered. Instead of watering too much (which can be an expensive over-use of irrigation systems and environmentally wasteful) or watering too little (which can be an expensive loss of crops), the farmer can ensure that crops get exactly the right amount of water. More money for farmers and more food for the world!  Just as our sight, hearing, smell, touch, and taste allow us, humans, to make sense of the world, sensors allow machines to make sense of the world. 2. Receiving and Acting on Information We’re all very familiar with machines getting information and then acting. Your printer receives a document and it prints it. Your car receives a signal from your car keys and the doors open. The examples are endless.  Whether it’s a simple as sending the command “turn on” or as complex as sending a 3D model to a 3D printer, we know that we can tell machines what to do from far away. So what?  The real power of the Internet of Things arises when things can do both of the above. Things that collect information and send it, but also receive information and act on it. 3. Doing Both Let’s quickly go back to the farming example. The sensors can collect information about the soil moisture to tell the farmer how much to water the crops, but you don’t actually need the farmer. Instead, the irrigation system can automatically turn on as needed, based on how much moisture is in the soil.  You can take it a step further too. If the irrigation system receives information about the weather from its internet connection, it can also know when it’s going to rain and decide not to water the crops today because they’ll be watered by the rain anyways.  And it doesn’t stop there! All this information about the soil moisture, how much the irrigation system is watering the crops, and how well the crops actually grow can be collected and sent to supercomputers that run amazing algorithms that can make sense of all this information.  And that’s just one kind of sensor. Add in other sensors like light, air quality, and temperature, and these algorithms can learn much much more. With dozens, hundreds, thousands of farms all collecting this information, these algorithms can create incredible insights into how to make crops grow the best, helping to feed the world’s growing population. Definition of IoT **What is IoT?**: The internet of Things, or “IoT” for short, is about extending the power of the internet beyond computers and smartphones to a whole range of other things, processes, and environments. Those “connected” things are used to gather information, send information back, or both.  **Why does IoT matter?**: IoT provides businesses and people better insight into and control over the 99 percent of objects and environments that remain beyond the reach of the internet. And by doing so, IoT allows businesses and people to be more connected to the world around them and to do more meaningful, higher-level work. |