**DAILY ASSESSMENT FORMAT**

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| **Date:** | **08/07/2020** | **Name:** | **Rashmi KB** |
| **Course:** | **Matlab** | **USN:** | **4AL16EC056** |
| **Topic:** | **Review Problems, Importing Data, Logical Arrays…** | **Semester & Section:** | **8th B** |
| **Github Repository:** | **rashmikb** |  |  |

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| **FORENOON SESSION DETAILS** | | | | | |
| **Image of session** | | | | | |
| **REPORT**  MATLAB is designed to work naturally with arrays. For example, you can add a scalar value to all the elements of an array.   * y = x + 2   Add 1 to each element of v1 and store the result in a variable named r.  This code sets up the interaction.   * r = 1 + v1   Create a vector vs that is the sum of the vectors v1 and v2   * vs = v1 + v2   Create a variable va that contains the value vs divided by 2 (the average volume)   * va = vs/2   Create a variable vm containing the maximum of the va vector   * vm = max(va)   Two vectors of the same length can be plotted against each other using the plot function.   * plot(x,y)   This code sets up the interaction.  **load datafile**  **sample = data(:,1);**  **density = data(:,2);**  **v1 = data(:,3);**  **v2 = data(:,4);**   * mass1 = density.\*v1;   mass2 = density.\*v2;  Create a plot with sample on the x-axis and mass1 on the y-axis   * plot(sample,mass1)   Electricity data is stored in a file named electricity.mat. Load that MAT-file into MATLAB.Then enter usage in the script to see the matrix.   * load electricity   usage  One of the elements in the usage variable has a value of NaN. Replace this value with the value 2.74   * usage(2,3) = 2.74   The residential data is stored in the first column. Create a variable res that contains the first column of usage   * res = usage(:,1)   The commercial data and industrial data are stored in the second and third column, respectively. Create variables comm and ind that contain the second and third columns of usage.   * comm = usage(:,2)   ind = usage(:,3)  Create a variable named lambdaEnd (λend) that contains the value of the last wavelength in the recorded spectrum. You can calculate lambdaEnd with the equation λ start(nObs−1)λ  Use lambdaEnd to make a column vector named lambda (λ) containing the wavelengths in the spectrum, from λ start to λ end   * in steps of λ   delta   * lambdaEnd = lambdaStart + (nObs-1)\*lambdaDelta   lambda = (lambdaStart:lambdaDelta:lambdaEnd)'  In MATLAB, there are three primary approaches to accessing array elements based on their location (index) in the array. These approaches are indexing by position, linear indexing, and logical indexing. Indexing with Element Positions The most common way is to explicitly specify the indices of the elements. For example, to access a single element of a matrix, specify the row number followed by the column number of the element. **INDEXING WITH LOGICAL VALUES** Using true and false logical indicators is another useful way to index into arrays, particularly when working with conditional statements. For example, say you want to know if the elements of a matrix A are less than the corresponding elements of another matrix B. The less-than operator returns a logical array whose elements are 1 when an element in A is smaller than the corresponding element in B. | | | | | |
| **Date:** | **08/07/2020** | **Name:** | **Rashmi KB** |
| **Course:** | **IOT** | **USN:** | **4AL16EC056** |
| **Topic:** | **Introduction to Automation** | **Semester & Section:** | **8th B** |

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| **AFTERNOON SESSION DETAILS** |
| **REPORT**  **What is Automation?**  Automation is any process that is self-driven and reduces, then eventually eliminates, the need for human intervention.  Automation was once confined to the manufacturing industry. Highly repetitive tasks such as automobile assembly were turned over to machines and the modern assembly line was born. Machines are excellent at repeating the same task without fatigue and without the errors that humans are prone to make in such jobs. This results in greater output, because machines can work 24 hours a day without breaks. Machines also provide a more uniform product.  The IoT opens up a new world in which tasks previously requiring human intervention can become automated. As we have seen, the IoT allows the collection of vast amounts of data that can be quickly analyzed to provide information that can help guide an event or process.  As we continue to embrace the benefits of the IoT, automation becomes increasingly important. Access to huge amounts of quickly processed sensor data started people thinking about how to apply the concepts of machine learning and automation to everyday tasks. Many routine tasks are being automated to improve their accuracy and efficiency.  Automation is often tied to the field of robotics. Robots are used in dangerous conditions such as mining, firefighting, and cleaning up industrial accidents, reducing the risk to humans. They are also used in such tasks as automated assembly lines.  **What Is Artificial Intelligence and Machine Learning?**  Artificial Intelligence (AI) is the intelligence demonstrated by machines. This is in contrast to natural intelligence which is the intelligence displayed by living organisms. AI uses intelligent agents that can perceive their environment and make decisions that maximize the probability of obtaining a specific goal or objective. AI refers to systems that mimic cognitive functions normally associated with human minds such as learning and problem solving.  Some of the tasks that currently are deemed to require a degree of AI are autonomous cars, intelligent routing in content delivery networks, strategic game playing, and military simulations.  As technology develops, many of the tasks that at one time required AI have become routine. Many of these tasks have migrated from AI to Machine Learning (ML).  ML is a subset of AI that uses statistical techniques to give computers the ability to “learn” from their environment. This enables computers to improve on a particular task without being specifically programmed for that task.  This is especially useful when designing and programming specific algorithms is difficult or infeasible. Examples of such tasks in computer science include malicious code detection, network intruder detection, optical character recognition, computer speech recognition, and computer vision.  One objective of learning is to be able to generalize based on experience. For machines, this involves the ability to perform accurately on new, previously unseen tasks after gaining experience with a learning data set. The training data set must come from data that is representative of the larger data pool. This data pool enables the machine to build a general model about this data, which would help it make accurate predictions.  **ML in the IoT**  One of the features of the IoT is that it enables the collection of extremely large pools of data that can “teach” programs how to respond in certain conditions. Some of the more common uses of ML technology include:   * **Speech Recognition** - Many different companies now offer digital assistants which allow you to use speech to communicate with a computer system. Apple, Microsoft, Google and Amazon all offer this service. These companies not only allow commands to be given verbally, but offer speech-to-text capabilities. * **Product Recommendation** - Systems build up a customer profile and recommend products or services based on previous patterns. Users of Amazon and eBay receive recommendations on products. Organizations such as LinkedIn, Facebook, and GooglePlus recommend users you may wish to connect with. * **Shape Recognition** - Programs exist that allow crude hand-drawn diagrams and notes to be converted to more formal diagrams and text. This allows the shapes and lines of hand writing to be converted to more formal text which can then be searched and analyzed. * **Credit Card Fraud Detection** - A profile is constructed about the purchasing patterns of a client. Any deviation from these patterns triggers an alert and the system automatically takes action. This action ranges from denying the transaction to notifying the authorities. Some of the events that are detected and could indicate a fraudulent transaction include purchasing products not normally purchased, purchases in a different geographic area, rapidly purchasing many different products, and purchasing large-ticket items. * **Facial Recognition** - Security cameras are everywhere, from stores and streets to airports and transportation hubs. These cameras continually scan the crowds, normally watching for dangerous or illegal activities, but they can also be used to identify and track individuals. The system builds a pattern of specific facial features and then watches for a match to these facial patterns triggering some action.   **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. |