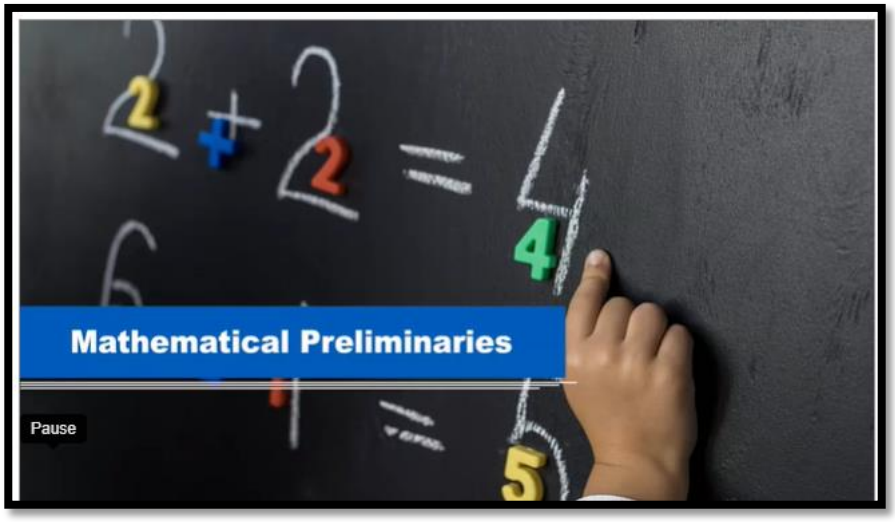
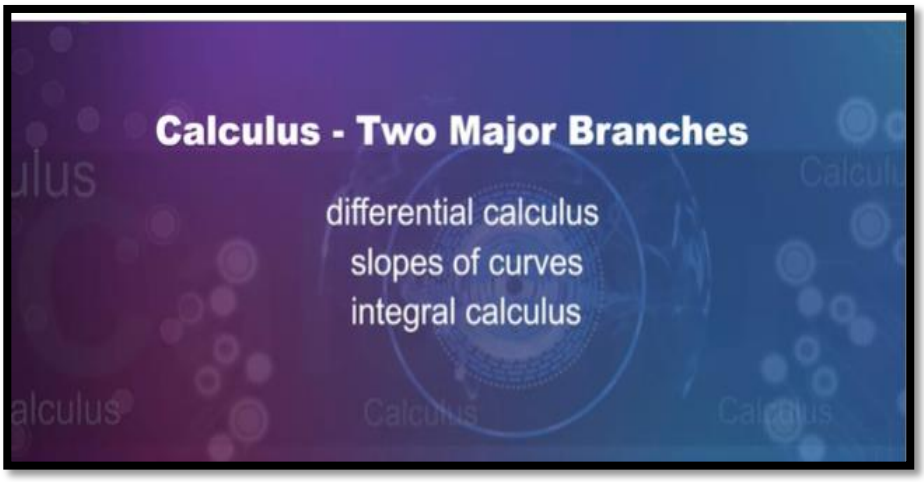
DAILY ASSESSMENT

Date:	**16/07/2020**	**Name:**	**Davis S. Patel**
Course:	**Computer Vision Basics**	**USN:**	**4AL16EC045**
Topic:	**Week 4**	**Semester & Section:**	**8th - A**
GitHub Repository:	**Davis**		

FORENOON SESSION DETAILS

Image of session





REPORT –

Computer vision is a relatively new and vastly growing field born out of the study of artificial intelligence. Through the study of computer vision, professionals attempt to replicate in computers the ability to process and identify visuals in 2D and 3D pictures. While this ability comes quite easily to humans and animals alike, it is much more difficult to reproduce in computers. When the field of computer vision was first beginning, it was thought of as a relatively simple problem to solve in the field of artificial intelligence. In 1966, one MIT undergraduate student was given the task to "spend the summer linking a camera to a computer and getting the computer to describe what it saw." (Szeliski 2011). Much to the student and his professor's surprise, this proved a much more difficult undertaking than they had expected. One of the primary reasons that computer vision proves so complex is because "vision is an inverse problem, in which we seek to recover some unknowns given insufficient information to fully specify a solution." (Szeliski 2011) To solve such a problem, mathematical models must be used in order to gain the best understanding of the problem available. The most common approaches to solving problems in computer vision are statistical and linear models. In statistical models, probability is used to determine what is most likely to be occurring in an image based on the known parameters of the problem and the proximity of 2 parameters to those of predetermined predictable outcomes. In models we solve with linear algebra, often multiple images at different but close times or different angles are taken. Properties identified in these images such as points, lines, and planes are stored as vectors in the camera matrix. Each of these vectors can be transformed via projective geometry so that the relative coordinate system of each image is aligned and the two images can be compared. Through the use of linear algebra and these other mathematical models, the field of computer vision has expanded rapidly.

Currently computer vision is being used in solving vital problems in a vast array of fields including medical imaging, surveillance, and face and object detection and identification. The techniques that linear algebra provides for solving complicated mathematical models is an essential tool in solving problems in each of these fields. Because we examine projections of linear systems in computer vision, it is often easier to describe points in homogenous coordinates. Homogenous coordinates are essentially taking the idea of our standard Euclidean

coordinate system and adding an extra dimension. One of the benefits of the use of homogenous coordinates is that they account for the concept of infinity, while infinity can only be approximated with limits in the Euclidean system. When using planes and lines to interpret curved surfaces or the intersection of two parallel lines, the concept of infinity becomes important. The benefit of homogenous coordinates can be imagined through picturing how as one looks at two parallel railway lines extending into the far off distance, the two lines appear to be getting closer and closer together and intersecting at some infinitely far away point. The point (1, 2) in Cartesian coordinates becomes (1, 2, 1) in homogenous coordinates and as this point moves out towards infinity we can continue to describe it in homogenous coordinates as (1, 2, 0). Oftentimes we will manipulate homogenous vectors through transformations. These transformations are linear transformations which usually act on the vector through multiplication with the transformation's matrix representation.

When utilizing linear algebra to solve problems in computer vision, least squares is a commonly important tool. Computer vision often deals with attempting to interpret real world data such as the intensity and wavelength of light. Like most real world data, these values are error-prone causing one camera's interpretation of a scene to appear slightly different from another camera's interpretation. Such is the case for image matching. In image matching, we begin with two images of a similar scene and attempt to match specific features in each scene to prove that the figures in each scene are the same. For example, take the case of face recognition. By looking at key features such as the nose, eyes, or jawline, we gain a set of vectors which can sufficiently describe each face. By comparing the features of the unknown face with the features of a face in our known database, we can find the most likely individual who the face belongs to.

Robust least squares, also known as least trimmed squares, is a way of solving the least squares problem when there are outliers in the data. The least trimmed squares method is a method which attempts to minimize only as subset of the residual so instead of solving $kAx - bk$ for values of $x = [x1, x2, ...xn]$ the problem is solved for only a subset $k < n$ of values contained in the x vector. Which values of x that are solved are found by computing the "ordered absolute residuals"(Doornick 2011) which means computing the residuals for every possible subset of k values from x and then selecting the solution which corresponds to the minimal residual. Non-

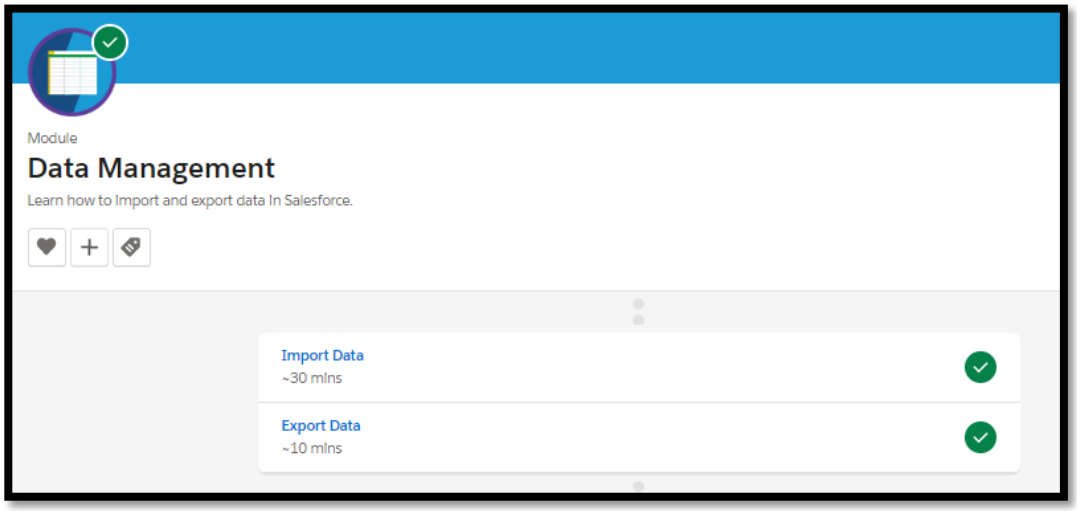
linear least squares is useful in solving some problems where the functions we are attempting to fit are not linear in the unknown parameters. This form of problem is “usually solved by iteratively relinearizing”(Szeliski 2011) about the estimate of the unknown parameter. In this case the solution to the overall non-linear least squares problem becomes solving $kJ\Delta p - rk$ for each of the residuals, r, to the solution of the linear least squares problem for the current estimate of the unknown parameters, p, where J is the Jacobian matrix of partial derivatives of the functions we are fitting to the current estimate of the unknown parameters.

DAILY ASSESSMENT

Date:	**16/07/2020**	**Name:**	**Davis S. Patel**
Course:	**Salesforce Developer**	**USN:**	**4AL16EC045**
Topic:	**Data Management**	**Semester & Section:**	**8th - A**
GitHub Repository:	**Davis**		

AFTERNOON SESSION DETAILS

Image of Session



REPORT –

Introduction to Data Import

We can easily import external data into Salesforce. Supported data sources include any program that can save data in the comma delimited text format (.csv).

Salesforce offers two main methods for importing data.

- **Data Import Wizard**—this tool, accessible through the Setup menu, lets you import data in common standard objects, such as contacts, leads, accounts, as well as data in custom objects. It can import up to 50,000 records at a time. It provides a simple interface to specify the configuration parameters, data sources, and the field mappings that map the field names in your import file with the field names in Salesforce.
- **Data Loader**—this is a client application that can import up to five million records at a time, of any data type, either from files or a database connection. It can be operated either through the user interface or the command line. In the latter case, you need to specify data sources, field mappings, and other parameters via configuration files. This makes it possible to automate the import process, using API calls.

With both methods, the number of records you can import depends on your permissions, the type of data you're importing, and the overall data storage limits for your organization. The type of objects we can import depends on your edition.

Use the Data Import Wizard When:

- You need to load less than 50,000 records.
- The objects you need to import are supported by the wizard.
- You don't need the import process to be automated.

Use Data Loader When:

- You need to load 50,000 to five million records. If you need to load more than 5 million records, we recommend you work with a Salesforce partner or visit the *AppExchange* for a suitable partner product.
- You need to load into an object that is not supported by the Data Import Wizard.
- You want to schedule regular data loads, such as nightly imports.

Data Loader uses the SOAP API to process records. For faster processing, you can configure it to use the Bulk API instead. The Bulk API is optimized to load a large number of records simultaneously. It is faster than the SOAP API due to parallel processing and fewer network round-trips.

Use the Data Import Wizard

Once you have created an export file and cleaned up the data for import, follow these steps to import data using the Data Import Wizard.

1. Start the wizard.
    a. From Setup, enter Data Import Wizard in the Quick Find box, then select **Data Import Wizard**.
    b. Review the information provided on the welcome page, then click **Launch Wizard!**
2. Choose the data that you want to import.
    a. To import accounts, contacts, leads, solutions, person accounts, or campaign members, click **Standard Objects**. To import custom objects, click **Custom Objects**.
    b. Specify whether you want to add new records to Salesforce, update existing records, or add and update records simultaneously.
    c. Specify matching and other criteria as necessary. Hover over the question marks for more information about each option.
    d. Specify the file that contains your data.

We can specify your data file by dragging the CSV to the upload area of the page or by clicking the CSV category you're using and then navigating to and selecting the file.

e. Choose a character encoding method for your file. Most users can accept the default character encoding.

This information can help you integrate your imported data into Salesforce.

New Values for Picklists and Multi-Select Picklists—If you import a picklist value that doesn't match an existing picklist value:

For an unrestricted picklist, the Data Import Wizard uses the value that's in the import file.

For a restricted picklist, the Data Import Wizard uses the picklist's default value.

Multi-Select Picklists—To import multiple values into a multi-select picklist, separate the values by a semicolon in your import file.

Checkboxes—To import data into a checkbox field, use 1 for checked values and 0 for unchecked values.

Default Values—For picklist, multi-select picklist, and checkbox fields, if you do not map the field in the import wizard, the default value for the field, if any, is automatically inserted into the new or updated record.

Date/Time Fields—Ensure that the format of any date/time fields you are importing matches how they display in Salesforce per your locale setting.

Formula Fields—Formula fields cannot accept imported data because they are read-only.

Field Validation Rules—Salesforce runs validation rules on records before they are imported. Records that fail validation aren't imported. Consider deactivating the appropriate validation rules before running an import if they affect the records you are importing.

Introduction to Data Export

You can easily export data from Salesforce, either manually or on an automatic schedule. The data is exported as a set of comma-separated values (CSV) files. Data export tools provide a convenient way to obtain a copy of your Salesforce data, either for backup or for importing into a different system.

Salesforce offers two main methods for exporting data.

- **Data Export Wizard**—an in-browser wizard, accessible through the Setup menu. It allows you to export data manually once every 7 days (for weekly export) or 29 days (for monthly export). You can also export data automatically at weekly or monthly intervals. In Professional Edition and Developer Edition, you can generate backup files only every 29 days, or automatically at monthly intervals only.
- **Data Loader**—a client application that you must install separately. It can be operated either through the user interface or the command line. The latter option is useful if you want to automate the export process, or use APIs to integrate with another system.

Using the Data Export Wizard

Get Cloudy is a high-tech consulting firm specializing in CRM implementations. Charnice Jones-Bauer, Get Cloudy's financial analyst, knows that data loss can have a serious financial impact on the business, so she sets up a meeting in the employee cafe with Salesforce admin Chinua Toure to talk about backups. Chinua explains that he automates weekly backups with the Data Export Wizard.