**D204 STUDY/TEACH-BACK PLAN**

**Tips:**

1. Download and review the “One Page Course Overview” from the Course Chatter.
2. Aim to complete the course in 2-4 weeks.
3. Review the lessons and the supplemental videos.
4. First attempt - Read everything, watch all the videos, and answer the chapter quizzes.
5. 2nd attempt!
6. t - Focus mostly on the text in Lessons 1, 2, and 3 and use the videos as supplements.
7. 3rd attempt should meet with the CI for a teach-back session with the 3rd attempt study guide.
8. Attend the Cohort to have a live session with your instructor(s). The cohort is on the 1st Sunday and Tuesday of every month.

**Exams:** **Pre-A 60 questions, 120 minutes; OA – 60 questions, 120 minutes**.

1. Competency 4030.2.1: The Data Analytics Life Cycle **30%**
2. Competency 4030.2.2: Project Planning **20%**
3. Competency 4030.2.3: Organizational Needs **25%**
4. Competency 4030.2.4: Data Analytics Tools and Techniques **25%**

**Lesson I: The Data Analytics Life Cycle**

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| --- | --- | --- | --- | --- |
| **Data Analytics**  **Life cycle**  **(7 Phases)** | **Tools and**  **Techniques** | **Potential**  **Problems** | **Data Pathway Terms**  **(4 Phases)** | **Data Science**  **(6 Phases)** |
| **1. Business Understanding/ Discovery phase**  An analyst defines the major **questions** of interest that need to be answered, determines the needs of the **stakeholders**, and assesses the **resource** constraints of the project. Define project **outcomes.** | **Tools:**   1. Scope Statement 2. Stakeholder Register 3. Gannt Chart 4. Network Diagram   **Techniques:**  1. Critical Path Method  2. KPI  3. Budget estimation techniques  4. Schedule estimation techniques.  5. SWOT Analysis | Lack of clear focus on:   * stakeholders, * timeline, * limitations, and * budget   could potentially derail an analysis | 1. Planning:   * Define goals. * Organize resources (software, hardware, staff) * Coordinate people * Schedule the project | 1. Find a question |
| **2. Data Acquisition**  **Collecting** data phase. Data is **collected** and **stored**, for easy **retrieval** from a database, perhaps a component of a data warehouse, by using a language like SQL. Web scraping and surveys to are also used to acquire data. Involves initial cleaning. | **Tools:**  1.SQL  2. Web Scrapping software  3. Survey  4. Input Data: Self-generated Data  5. NoSQL- Used to collect structured and unstructured Data.  **Techniques:**  1. ETL/ELT  2. API  3. Web Scrapping | **Missing Values** may not be detected  **Quality**: uniqueness, relevance, reliability, validity, and accuracy.  **Type of data:** structured, unstructured, semi-structure, quantitative, qualitative.  **Access:** data may be difficult to access. | 1. Wrangling:  * Get Data | 1. Collect the Data |
| **3. Data Cleaning phase**. Also known as data **cleansing**, data **wrangling**, data **munging**, and **feature engineering**. The analyst will use SQL, Python, R, or Excel to perform data **modifications** and **transformations** | **Tools:**  1.Python  2. R  3. SQL  4. Excel  **Techniques:**  1. Data Reduction: optimize storage capacity  2. Modification  3. Transformation  4. Anomaly Detection | 1. Some cleaning techniques could dramatically change data/outcomes.  2. Outliers not dealt with can cause problems with statistical models due to excessive variability. | Wrangling:   * Clean Data | 1. Prepare the Data |
| **4. Data Exploration** **phase.** Analyst begins to understand the **basic nature of data**, the **relationships within it (btw data variables),** the **structure of the dataset**, the presence of **outliers,** and the **distribution** of data values. This phase uses data visualization tools and numerical summaries such as measures of central tendency and variability. | **Tools:**  1.Distributions: Normal or Skewed Curve  2. Visualization Tools: tableau, R, Python, RStudio, and histogram.  3. Statistical Tools such as mean, median, and mode.    **Techniques:**  1. Correlation Discovery  2. Pattern Discovery  3. Visualization Techniques: histogram, charts, tables, boxplot, etc.  4. Variability: STD, Quartile | Skipping this step could:  1. Enable faulty perceptions of the data which hurt advanced analytics.  2. The analyst will lack insight into the structure of the data set. | Wrangling*:*   * Explore Data * Refine Data |
| **5. The predictive**  **Modeling phase.** Allows the analyst to move beyond describing the data to **creating models** that enable **predictions of outcomes** of interest. Python and R are used in automating the training and use of models. | **Tools:**  1. Python  2. R  **Techniques:**  1. Data Modeling  2. Correlation Modeling  3. Regression Modeling  4. Time Series Modeling  5. Cross Validation  6. Regression Models  7. Classification Models  8. Clustering  9. Training | 1. Too many input variables (predictors) can cause problems.  2. Correlation does not imply causation.  3. Time series models often need sufficient time data to offer precise trending.  4. Predictive model accuracy should be assessed using cross-validation. | Modeling   * Create the model * Validate the model * Evaluate the model * Refine the model | 1. Create the Model 2. Evaluate the Model |
| **6. The data mining phase.** Looks for **patterns and correlations in large** sets of data. Tools are Python and R. Also called Machine learning. A specialized segment of data mining techniques that continually update to improve modeling over time.  **Note.** Both Exploration and mining uncover patterns. The difference is that data exploration is an initial step to uncover initial patterns and using both manual and automated methods. While data mining is an **in- dept step to discover patters using automated** methods like machine learning. | **Tools:**  1.Python  2. R  **Techniques:**  1. Training dataset to build models.  2. Testing dataset for model evaluation  3. Classification  4. Clustering  5. AI  6. Machine Learning  7. Deep Learning | 1. Running on entire data is problematic.  2. Needs to subset data into training and testing datasets to build models.  3. Training Data: machine learns on training data to improve models.  4. Testing Data: evaluate the model itself.  5. Too little sample could cause limited insight. |
| **7. The data reporting phase.** Analyst tells the story of the data and uses graphs or interactive dashboards to inform others of the findings from the analyses. Tools such as Tableau is used to spot trends and patterns. Goal is to give actionable insight to stakeholders. | **Tools:**  1.Dashboards:  2. Tableaux  3. Story telling: a feature of tableaux  4. Graphs, charts, images, histogram, etc.  **Techniques:**  1. Visualization  2. Stakeholder communication | 1. Due to potential large audience consumption, mistakes can cause bad business decisions and loss of revenue  2. Improper scales used in graphs could push for interpretations of the story that is inaccurate. | 4. Applying / Reporting and Visualization   * Present the model * Deploy the model | 1. Deploy the Model |

**Lesson I: The Data Analytics Life Cycle Cont’d**

### Data Modification: any alteration, removal or addition to the data. Also involves changing the existing data values or the data itself. Sorting the data in alphabetical order.

### Data Transformation: changing data from a raw format to a target format, e.g. from XML to DB. Also involved changing the dimension of the data e.g., removing features through PCA or Feature Selection and coming up with a new dataset. The goal is to make the data easy to access, consistent, secure, and trusted by the intended users.

### Anomaly Detection: identifies suspicious activity that falls outside of the normal patterns of behavior, e.g., data breaches, and other harmful events.

### Pattern Discovery: Finding out periodic and abnormal patterns, from temporal data. Finding hidden information from the data which is not possible in using data mining.

### Correlation Discovery: Finding out the different types of correlations, the strength of the linear relationship between two variables, the level of change in one variable due to the change in the other.

### Questions that Data Analysis Answers

### Define each component below and provide an example of each.

### Descriptive Analytics – What happened? – Observation/Describe event. It is the interpretation of historical data to better explain market developments.

### Diagnostic Analytics – Why did it happen? – Explains the reason for the event. It enables the extraction of value from data by posing the right questions and conducting in-depth investigations into the problems.

### Predictive Analytics – What will happen? – Correlation. Predicts what will happen in the future. It uses data, statistical algorithms, and machine learning techniques to determine the JS of potential outcomes. The aim is to have the best assessment of what will happen in the future, rather than simply understanding what has happened.

### Prescriptive Analytics – How can we make it happen? – *Keywords:* Change/Action/Solution/Causality/Manipulation/Decision Making. It helps organizations make decisions.

### What is the relationship between predictive and prescriptive analytics? Predictive and prescriptive analytics are two forward-looking tools used by business leaders. Predictive analytics uses collected data to come up with future outcomes, and prescriptive analytics takes that data and make decisions that cause future outcomes.

**Lesson II: Data Analytics Tools and Techniques**

**Graphs: Histogram, Boxplot, Heatmap, and Scatterplot.**

**Histograms** show numerical data in “groups” or bins that allow bars to represent frequencies. Helps detect Outliers.

A **boxplot** provides a concise summary of the quartiles of numerical data (i.e., cut points that divide the data into 25% percentile segments). This graph is also convenient for detecting outliers and skewness.

A **heatmap** is a colorful graph that can visually show frequency or interaction using a range of colors.

A **scatterplot** is a two-dimensional graph that is great for visualizing correlations or relationships. Each dot on the scatterplot represents an outcome for two numerical variables of interest.

**Techniques:** Regression, Classification, Clustering, etc.

**Tools:** Python and R.

1. **List and define the various data types and examples.** 
   1. **Structured** – numbered and labeled stored in an organized framework with columns and rows, e.g., SQL, databases, Excel, etc.
   2. **Semi-structured** – loosely organized in categories using tags. e.g., Emails, CSV, XML, JSON doc., etc.
   3. **Unstructured** – text heavy, information not organized in a clearly defined framework. e.g., images, text, videos, audio, etc. Images – the most basic unstructured data. Text - Nominal qualitative data, PDF, strings, alphanumeric.
   4. **Quantitative –** Known as numerical, parametric, interval, continuous, discrete.

* **Discrete** values are fixed, taking certain values, total items sold, count totals, individual items sold, currency, and prices.
* **Continuous** – measurable values, quantitative data, time series data.
* **Numeric characters** – quantitative data -represented by specific number-based data types.
  1. **Qualitative –** known as nominal or ordinal.Describes the basic features of the data in a study.
     + **Ordinal data** - follows a natural order: low, middle, high income, etc.
     + **Nominal Data** - no assumed natural order e. g. safety features of a vehicle; model and make of vehicles, speed of a vehicle, dimensional data, textual data, etc.
     + **Categorical data** - **qualitative** data defined by specific qualities of the data, analysts cannot directly count, e.g., model and make of vehicles.
     + **Non-parametric -** data that is falling outside of normal distribution

1. **Define a relational database -** Collection of data items with predefined relationships between them e.g. collection of tables.
2. **List the various data sources**. In house, open Data, web server, data lake, data warehouse, self-generated.
3. **What are the various data analytics applications/processes?** 
   1. **Python** – is open-source general-purpose programming language. Python provides a more general approach and has several libraries that are useful to data science. Used by engineers and programmers.
   2. **R** – open-source programming languages with new libraries or tools added continuously. **R** is mainly used for statistical analysis. Used by statisticians, educational researchers, etc.
   3. **Tableau** - Tableau is visual analytics engine that makes it easier to create interactive visual analytics in the form of dashboards.
   4. **API** stands for Application Programming Interface. An API is a software intermediary that allows two applications to talk to each other. In other words, an API is a messenger that delivers your request to the provider that you are requesting it from and then delivers the response back to you e.g., pay with PayPal, or SQL.
   5. **XML**– extensible markup language. A markup language is a set of codes, or tags, that describes the text in a digital document. the common language used in API web services.
   6. **SQL –** Is a domain-specific language used in programming and designed for managing data in relational database management systems. Helps pull data from databases.
   7. **D3.js –Data-driven document** is a JavaScript library for manipulating documents based on data. D3 helps bring data to life using HTML, SVG, and CSS.
   8. **Search engine** – the program that searches for and identifies items in a database that correspond to keywords or characters specified by the user.
   9. **JSON –** JavaScript Object Notation, a lightweight format for storing and transporting data on networks. Also, an open standard file format, and data interchange format, use human-readable text to store and transmit data objects consisting of attribute–value pairs and array data types (L5, p7).
   10. **Boxplot** provides a concise summary of the quartiles of numerical data (i.e., cut points that divide the data into 25% percentile segments). This graph is also convenient for detecting outliers and skewness. L5, p7
   11. **MLaaS -** Machine learning as a service (MLaaS) is an array of services that provide machine learning tools as part of cloud computing services. MLaaS helps clients benefit from machine learning without the cognate cost, time, and risk of establishing an in-house internal machine learning team.
   12. **ETL** – Extract, Transform, and Load – moves data between warehouses – from source warehouse to destination warehouse. It is a type of data integration that is used to blend data from several sources and is often used to build a data warehouse.
   13. **ETLTL** – Extract, Transform, Load, Transform, and Load—another version of ETL. – Tends to load anything and everything into a warehouse or a data lake from where it can be analyzed at a later point in time.
   14. **Extract, Load, and Transform (ELT)** - is a more modern model than ETL.
   15. **Survey Q&A type:** simple, multiple, and Likert choices.
   16. **Stratified** - method of broking down data into subgroups and randomly used within larger groups.
   17. **Public databases** - use to locate thousands of useable data sets online.
   18. **Delta Load** - loads new data into a system and updates any existing data since the last load.
   19. Extensible Markup Language (XML) - the common language used in API web services.
   20. **Training** Data set is implemented to build up a model. Data points in the **training** set are excluded from the **test** (validation)
   21. **Test** (or validation): The test data set is used to validate the model built.
   22. **Normal Distribution (Bell-Shaped)**, a symmetrical curve centered around the mean. Its data falls to the empirical rule that indicates the percentage of the data set that falls within (plus or minus) 1, 2, and 3 standard deviations of the mean.
   23. **Bell curve with a long tail end.** It is a bell curve with a long tail distribution. The long tail is the portion of the distribution having many occurrences far from the central part of the distribution. In sales, it may mean more people buying individualized niche products.
   24. **Histogram -** A simple and commonly used plot to quickly check the distribution of a sample of data. In the histogram, the data is divided into a pre-specified number of groups called bins. The data is then sorted into each bin and the count of the number of observations in each bin is retained. It helps show outliers in data and skewness.
   25. **Qlik** (not in our videos)- an end-to-end platform that includes data integration.
   26. **A heatmap** is a colorful graph that can visually show frequency or interaction using a range of colors. Red is used mostly for most frequency while blue is used for least frequency.
   27. **Scatterplot** is a two-dimensional graph that is great to visualize correlations or relationships. Each dot on the scatterplot represents an outcome for two numerical variables of interest.
   28. **OLTP** - Software that conducts many database transactions in real-time and over the internet at the same time – Online Transactional Processing.
   29. **OLAP** - OLTP without affecting transactional systems. Allows a high volume of data to be analyzed more effectively.
   30. **Snowflake schema** - features a single fact table joined to related dimension tables. The dimension tables might be tied to other dimension tables.
   31. **Star schema** - Any related dimension tables join to a single fact table in a visual layout that looks like a star. It is one of the simplest schemas to use.
   32. **Non-relational database (NoSQL)** addresses the need for web-based databases to handle large amounts of traffic and organizational data and is easier to scale and build for web applications. Can store structured and non-structured data. Uses various programming languages to retrieve and handle transactions.

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| **PYTHON VS R** | |
| **PYTHON** | **R** |
| Used by programmers that want to delve into data analysis or apply statistical techniques, and by developers and programmers that turn to data science. | Used primarily in academics and research and is great for exploratory data analysis. In recent years, enterprise usage has rapidly expanded. |
| A production-ready language with capacity to be a single tool that integrates with every part of your workflow! | Used by statisticians, engineers, and scientists without computer programming skills. It’s popular in academia, finance, pharmaceuticals, media, and marketing. |
| Easier for people with software engineering background. | Easier for people with no coding experience. |
| Coding and debugging is easy because of the simple syntax. | Statistical models can be written with only a few lines. |
| The indentation of code affects its meaning. | The indentation of code does not affect its meaning |
| Any piece of functionality is always written the same way with Python. | The same piece of functionality can be written in several ways. |

1. **What is the difference between scripting and programming used in data** **analytics?** Scripting languages are interpreted, and Programming languages are compiled. In other words, programming uses a compiler to convert the language to machine language, while scripting uses an interpreter (like PowerShell) to convert the language to machine language.
2. **Define/Describe the methods used to validate models.** Cross-validation and testing to new data.
3. **Regression** is a technique that allows us to predict an outcome based on a set of predictor variables. It is like providing output given a set of inputs.

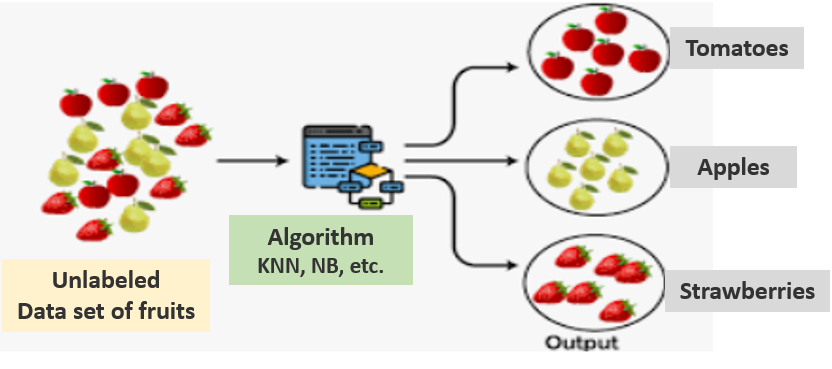
1. **Trend analysis.** Regression analysis and a function of time in a value. Understanding how and why things have changed over time. Ex. Stock prices. In data analytics, trend analysis involves figuring out the path your data is on. It starts by plotting a line, making a graph of changes over time, then connecting the points. Trying to find a function for a particular line like the number of people that visit a site. movement, etc. et
2. **Time series -** a statistical tool that deals with a sequence of data in chronological order. A technique that looks for trends in data over time.It also involves separating data into an overall trend. TM data can be phrased as supervised learning. Given a sequence of numbers for a time series dataset, we can restructure the data to look like a supervised learning problem. We can do this by using previous time steps as input variables and using the next time step as the output variable. Time Series Examples include the daily log returns on stock, monthly values of the consumer price index, or CPI, which is a measure of the national inflation rate.
3. **Decomposition** is breaking time series data into components. Its procedures are used in time series to describe the reasons for variations in trends.

1. **Spectral Density:** This is a graph that shows frequencies related to the autocovariance time domain.

1. **Define/Describe Machine learning and artificial intelligence.** Machine learning involves using algorithms and statistical models to analyze and draw inferences from patterns in data. Machine learning focuses on the development of computer programs that can access data and use it to learn for themselves. Artificial Intelligence (AI) is the development of smart machines capable of performing tasks that typically require human intelligence. EX. Visual perceptions, speech recognition, online cheque processing, decision-making, natural language processing (NLP), etc.

1. **Define/Describe the various data mining/machine learning methods and techniques** (provide an example of projects/situations) Tools are python, and R. Machine learning techniques include:
   1. **Classification** – A technique in which the analyst wants to assign an item to a specific category based on various conditions. **Discuss the general approach to classification**. The general approach that the model uses is to find the location of the item needing classification among measurements of interest, compare this item to items close by, then assign them to a group. Also used for object detection, spam detection, cancer detection, etc. Methods: **K Nearest Neighbors**
   2. **Clustering** – groupings are unknown, and the analyst wishes to determine if the objects belong to any group. An example of clustering is when data on search queries are analyzed to determine if they group in a particular way and how many groups exist. Examples include genome patterns, google news, and pointcloud processing.

**Example 1**: You are given medical data to find out the conditions of the patients. You have no idea what type of conditions (cancer, diabetes, asthma, etc.) exist in the data and how many of those conditions. Your job now is to group the patients based on their conditions and in the process, you will figure out how many of those conditions exist in the data set. What you are doing is called Clustering.

**Example 2:** Clustering is unsupervised learning, meaning the algorithm is not guided or provided any supervision and the dataset is unlabeled. In this example, the algorithm is given a dataset of fruits to figure out what types of fruits and how many types of fruits are in the data set. 

* 1. **Baye’s theorem** – Is the probability of observing various data, given the hypotheses, and the observed data. It gives you the after-the-data probability of a hypothesis as a function of the likelihood of the data, the probability of getting the data you found.
  2. **Naïve Bayes,** founded by Thomas Bayes, is an algorithm that applies Baye’s theorem to estimate the conditional probability of an outcome. Naïve Bayes Classifier is a machine learning model used to classify the object based on different features.
  3. **Principal Component Analysis (PCA)**. In PCA, an analyst attempts to find out if the variables themselves group in any meaningful way. PCA is a data reduction method used to reduce the dimensionality of large data sets, by transforming a large set of variables into a smaller one that still contains most of the information in the large set.
  4. **Dimensionality reduction:** Reduces the number of variables and the amount of data. You will deal with a single score and not multiple scores or a lot of data. It uses techniques such as Principal Component Analysis (PCA), Factor Analysis, & Feature Selection.
  5. **Data Reduction** is simply reducing the amount or volume of data in each storage or database. One of the goals is to optimize storage capacity.
  6. **Hierarchal Clustering** – algorithm that groups similar objects into groups that are called clusters.
  7. **Anomaly Detection**: Is the identification of rare items, events or observations in a dataset which differ from the norm or raise suspicions. It can be used to detect fraud, intrusion, outliers, technical glitch, etc. in a dataset. Tools include R, RStudio, Tableau, MS Excel, Editor, etc. Techniques include local outlier factor (LOF), alfa function, etc.
  8. **Neural networks** – algorithm that mimic the operations of human brain to recognize relationships between vast amounts of data. It is modeled roughly after the neurons that are inside a biological brain. They are on and off switches that relate to each other. Taking very basic pieces of information and connecting it with many other nodes and it is very high-level cognitive decisions and classifications. Example: NN and NLP techniques can be used to analyze product reviews submitted by the customers and identify positive and negative sentiments from those reviews.
  9. **Deep Learning:** is a type of neural network capable of performing text classification. Also, a type of recurrent neural network (RNN) that works best on sequential data.
  10. **Decision trees** – tree like model of alternative decisions and their consequences. It is a whole series, a sequence of binary decisions based on your data, that can combine to predict an outcome. It branches out from one decision to the next.
  11. **Optimization Analysis** - finding the best value for one or more target variables given certain constraints. It shows what value a variable should have, given certain conditions or restraints.
  12. **Supervised Model**: Machine learning algorithm that learns on a labeled dataset, providing an answer key that the algorithm can use to evaluate its accuracy on training data. E.g., classification and regression.
  13. **Unsupervised Model**: In contrast, provides unlabeled data that the algorithm tries to make sense of by extracting features and patterns on its own. Example Clustering, anomaly detection, neural network.

14. **What is the most effective way of virtual communication:** Video conferencing.

### Lesson III: Organizational Needs and Ethical and Legal Issues

1. **What decisions are necessary to initiate a data analytics project?** Knowing the goals of an organization, resource availability, stakeholders, and the outcome(s) of the project.
2. **What are the implications of undefined outcomes of potential data analytics projects?** \*Project will not be aligned with organization needs.
3. **How does one define research questions within an organization?** Formulate questions that align with the organizational needs.
4. **Summarize the legal frameworks for data governance.** Data Privacy laws covering the collection and sharing of personally identifiable information (PII) (Example: GDPR in the EU, IRAC, HIPPA. IRAC is an acronym that generally stands for: Issue, Rule, Application, and Conclusion. It functions as a methodology for legal analysis. The IRAC format is mostly used in hypothetical questions in law school.

5**. Define Conflict of Interest in the context of data frameworks.** Conflict of interest in the context of data framework refers to not being ethical or compromising analysis to allow it to lean towards favorable results.

6. **Define Democratization** is the ability for information in digital format to be accessible to the average end-user**.** One of the goals is to allow non-specialists to be able to access data without technical requirement. It means that everyone should have access to the data and there isn’t a gatekeeper that can create a bottleneck to the data.

### Lesson IV: Teamwork, Collaboration, and Data Project Planning

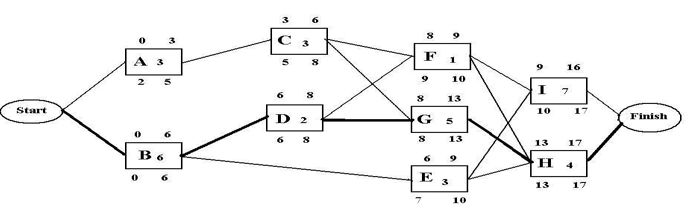
1. **Define the various roles in the workplace in a data analytic project** (provide examples if possible).

* Project sponsor provides funds,
* Program managers provides direction,
* Project manager coordinates and manages the triple constraints, and gets the data/reports out to the organization,
* Researcher pushes the team to ask interesting questions and identifies key problems,
* Data analyst obtains and cleans data, displays data in reports, and searches for trends and outliers.
* The unicorn is the ninja knows everything.

1. **Define the various roles of potential partners and stakeholders in data analytics projects (provide examples, if possible).**

* Stake holders are people who have an interest/power in any decision or activity of the project/organization. They could be involved project plan development, change control board, requirements gathering, risk management, and advocacy.
* Partners are the organizations responsible for carrying out specific project activities in the manner and scope indicated in an application form.
* Third parties may include regulatory agencies/customers. ior groups.

1. **Explain and define the critical path and its relationship to project timeline** (deadlines, milestones, etc.). Critical path is the longest path of activities on a project or the minimum of time necessary to complete all project works. Delay on the CP activities could delay the project.



**Network Diagram showing critical path.**

**Longest Path = B, D, G, H; Minimum Time = 17 days**

**Explain the IRON triangle and the challenge of balancing resources in data analytics projects**. Iron meaning it’s not negotiable. WGU presents an iron triangle as the triple constraints of cost, quality, and time. Other scholars present the iron triangle in graphical form showing the project constraints of Time, Cost, Scope. Other Names include Golden Triangle, Triple Constraints, and Trinity. Quality is a central them which is at the midpoint. If you break Iron Triangle by making a change to one constraint, other two need to be adjusted accordingly otherwise quality will suffer. Some variations use quality interchangeably with scope. For your OA purposes, the iron triangle will be **Cost, Quality, and Time**. See examples below:



1. **What are effective interpersonal communication skills**? Effective interpersonal communication skills include persuasion, verbal communication, non-verbal communication, active listening, problem-solving, and decision-making.
2. **What is active listening?** It involves being able to listen to others with understanding and empathy.
3. **Describe co-creation approaches and tools. Co-creation is collaboration**. This means creating meaningful dialog together that focuses on the problem, opportunity, and solution. They can use diagrams, charts, and visuals. Its strategy aims at bringing together different groups of people and third parties to assist with a project or product development. Examples of tools teams use to co-create include Google docs, Slack, Microsoft Teams, etc.

**Quizlet 1:** <https://quizlet.com/585467577/my-d204-wgu-study-set-flash-cards/><https://quizlet.com/585467577/test>

**Quizlet 2:** <https://quizlet.com/585467577/my-d204-wgu-study-set-flash-cards/>

**Cohort Information**

See the homepage of D204

**Session number:** 120 126 7825

**Password:** d204

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