**Exercise 05**

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**EM 624: Informatics for Engineering management**

**Part 1:**

1. **What is Agile software development and why it’s relevant?**

Agile software development is a software development practice that includes discovery of solutions and improvement through collaborative efforts of teams with self-organizing and cross-functional abilities with the end users that involves adaptive planning, evolutionary development with before end time delivery using continuous improvement having flexible responses for change in requirements or capacity or understanding the problems that needs to be solved.

Agile software development is important as it reduces technical debt, helps easily & quickly adapt to change, using agile for mobile application development & testing creates total alignment and transparency, minimizes test risk, helps deliver high quality product, provides better project control, greater customer satisfaction, has a user focused oriented testing, gives a better stakeholder engagement.

1. **Why waterfall approach is rarely a great solution for software development?**

The waterfall methodology uses a sequential or linear approach to software development. The project is broken down into a sequence of tasks, with the highest-level grouping referred to as phases. A true waterfall approach requires phases that are completed in sequence and have formal exit criteria, typically a sign-off by the project stakeholders. A typical list of waterfall tasks would include:

Scope and plan project, Gather and document requirements, Design application, develop application and perform unit tests, Conduct system testing, Perform UAT, Fix application as appropriate, Deploy application

1. **Define machine learning and provide examples of its applications?**

Machine learning is a subfield of artificial intelligence, which is broadly defined as the capability of a machine to imitate intelligent human behavior. Artificial intelligence systems are used to perform complex tasks in a way that is like how humans solve problems.

an algorithm would be trained with pictures of dogs and other things, all labeled by humans, and the machine would learn ways to identify pictures of dogs on its own. Supervised machine learning is the most common type used today.

an unsupervised machine learning program could look through online sales data and identify different types of clients making purchases.

Google Translate was possible because it “trained” on the vast amount of information on the web, in different languages.

Machine learning is also associated with several other artificial intelligence subfields: Neural networks and deep learning.

**Part 2**

**Testing Strategy for EX05**

**Aim:**

Using data provided in .csv file to print details and create a bar and pie charts showing the number of people who died because of comorbidities in COVID-19 cases & also explore between the different variables.

**Testing Strategy:**

* The program imports the data file covid\_comorbidities\_USsummary.csv using the pandas function and imports file into the PyCharm terminal.
* Post importing the file into terminal the program imports the matplotlib.pyplot which runs the graph library function in python to print the expected visualization output of the program.
* Using the pandas define function program reads the .csv file.
* The program separates the data inside the file according to the headers.
* After separating data into individual columns according to header mentioned in file.
* The program reads the condition of deaths other than COVID-19 then reads the data to determine number of deaths in the age groups below 35 years along with the disease condition having most deaths without COVID-19.
* Having calculated the conditions of death other than COVID-19. The program moves ahead onto collecting data from the file having condition of death as COVID-19 in each age group eliminating the total number of deaths across ‘all age’ groups along with number of deaths mentioned as condition ‘not stated’.
* Using the data gathered by program till now the program proceeds onto creating a visualization output using the matplotlib.pyplot function that prints out the details from program code and creates a pie as well as a bar graph representing the number of deaths across all age groups.

**Expected Output:**

The comorbidity of highest number of deaths below age 35 is Influenza and pneumonia with 1708 deaths.

Total count of people per class of age

Age Group COVID-19 Deaths Number of Mentions

0-24 2019 2468

25-34 7824 8942

35-44 21196 23662

45-54 61764 67885

55-64 162344 178541

65-74 302366 332030

75-84 379464 414499

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