18DCS007
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DSA
UNIT TEST - I
03/09/2021

Q1. Formula for covariance $\text{Cov}(x,y) = \frac{\sum_{i=1}^{n} (x_i - \bar{x})(y_i - \bar{y})}{n-1}$

Mean of x = (98 + 87 + 90 + 85 + 95 + 75) 6 = 88.33

Mean of y = (15 + 12 + 10 + 10 + 16 + 7) /6 = 11.67

Subtract each value from its respective mean & then multiply these new values together

TEMPERATURE $(x - \bar{x})$	CUSTOMER $(y - \bar{y})$	PRODUCT $(x - \bar{x})(y - \bar{y})$
9.67	3.33	32.20
-1.33	0.33	-0.44
1.67	-1.67	-2.79
-3.33	-1.67	5.56
6.67	4.33	28.88
-13.33	-4.67	62.25

Adding all the products together it yields the value 125.66

Final step, divide by (n-1) = 6-1 = 5

∴ 125.66 / 5 = 25.132

Q2. HADOOP is a software framework from apache software foundation that is used to store & process big data.

It is like a platform or a suite which provides various services to solve the big bata problems.

→ In includes open source projects as well as a complete range of complementary tools.

→ Major component of Hadoop include HDFS, YARN, HADOOP COMMON, HIVE, etc-

HDFS - HDFS stands for Hadoop distributed file system. It is major component of Hadoop ecoystm & is responsible for storing large data sets of structured or unstructred data access various node & there by maintaing the metadata in form of log files

WORKING OF HDFS

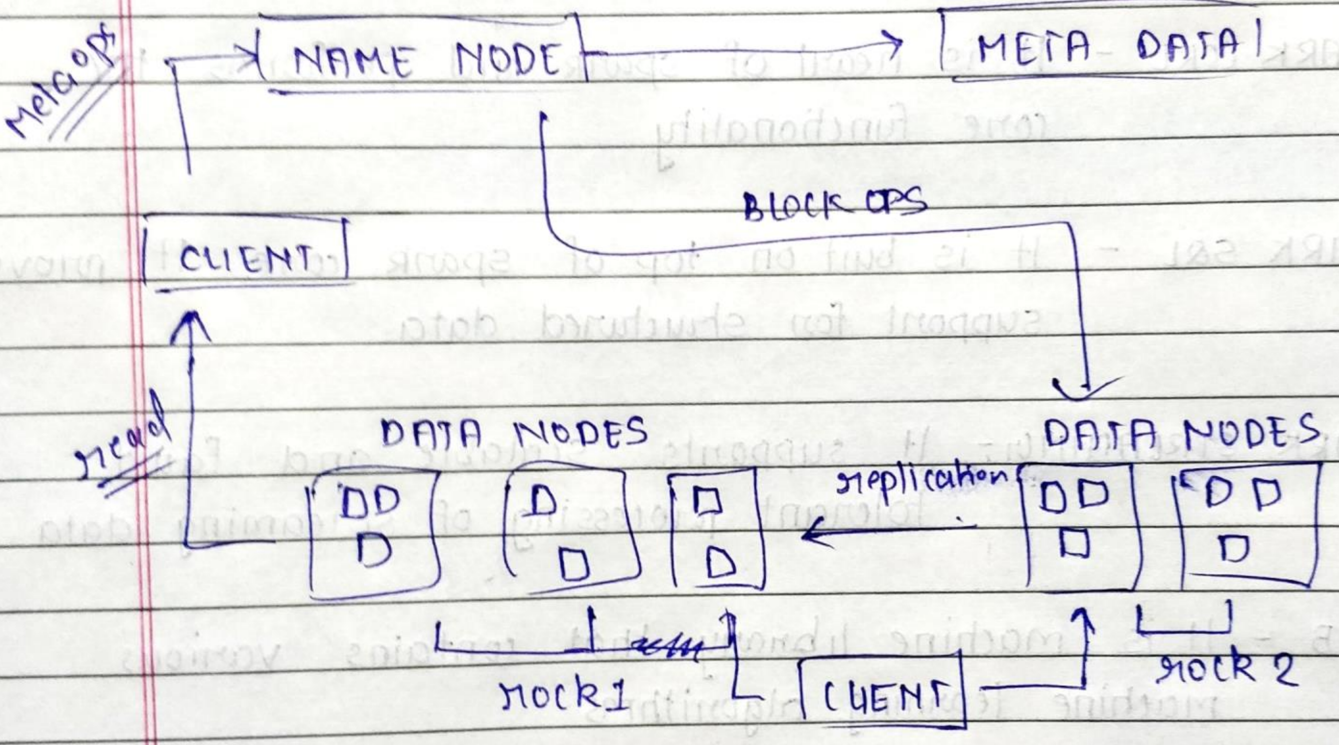
→ It enables rapid transfer of data between nodes.

→ It is closely coupled with map reduce & it organizes & condenses the result into a cohesive answers to query

→ It breaks the info into separate blocks & distributed them to different nodes in cluster.

→ It keeps the track of where file data is kept in the cluster.

HDFS ARCHITECTURE



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Q3 SPARK ECOSYSTEM consists of different types of tightly integrated components. At its core, spark is a computational engine that can schedule, distritute and monitor multiple applications.

SPARK CORE - It is heart of spark and performs the core functionality

SPARK SQL - It is buit on top of spark core. It provide support for structured data

SPARK STREAMING - It supports scalable and fault-tolerant processing of streaming data

MLIB - It is machine library that contains various machine learning algorithms

GRAPHX - It is library that is used to manipulate graphs & perform graph parallel computations.

Features of spark are:

→ Lightning fast processing speed
→ ease of use
→ real time stream processing
→ flexible
→ offeres support for sophisticated analysis
→ active & expanding community