

DSHC Assignment - 3

Q1. Apply the temporal data mining process to be carried out to extract meaningful insights from healthcare data collected through sensors.

⇒ Temporal data mining is a crucial process for extracting meaningful insights from healthcare data collected through sensors. Temporal data mining focuses on analysing data with a time component, which is common in healthcare data, as it often includes time-stamped records from sensors, patient monitoring devices, electronic health records, & more.

① Data Collection & Preparation:

Data Collection:

Gather healthcare data collected through sensors, such as vital signs (e.g. heart rate, BP), patient activity or medications records. Ensure that the data includes time stamps.

Data Cleaning:

Clean the data to handle missing values, outliers, & inconsistencies. Verify that timestamps.

② Temporal Data Representation:

Time Series Conversion:

Transform the data into time series format, where each data point is associated with a specific timestamp.

③ Temporal Anomaly Detection:

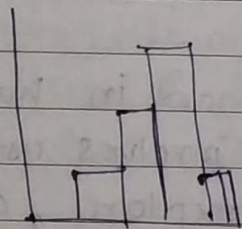
Using ML model detect anomalies in data sets.

- ④ Predictive modelling:
create a predictive model for real time streaming data.
- ⑤ Interpretation & Insights:
Interpret Results:
Interpret the results of temporal data mining & ml models.
- ⑥ Deployment & Monitoring:
model Deployment on GCP, Amazon AWS, Microsoft Azure.

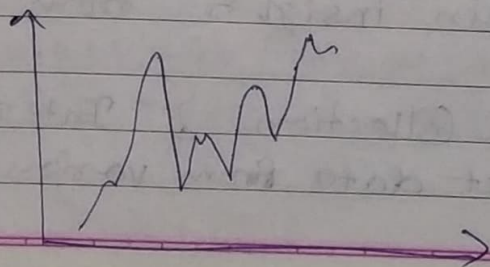
Continuous monitor the data & prediction the

- Q2. Elaborate using eg. the standard techniques to visualize different kinds of medical data.
- ⇒ Visualizing medical data is essential for healthcare professionals to gain insights, make informed decisions, & communicate findings effectively. Different types of medical data require specific visualization technique.

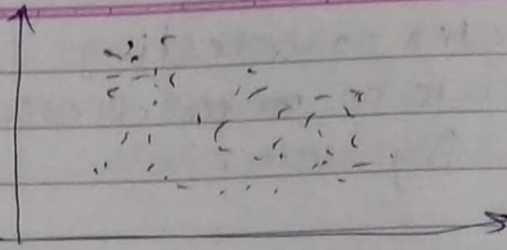
① Bar charts & Histograms.



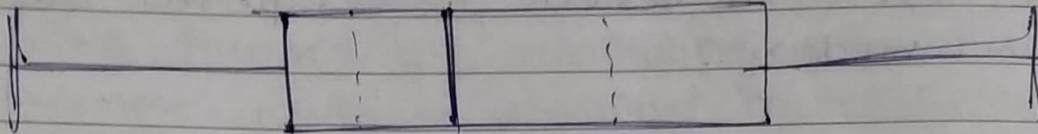
② Line Chart :



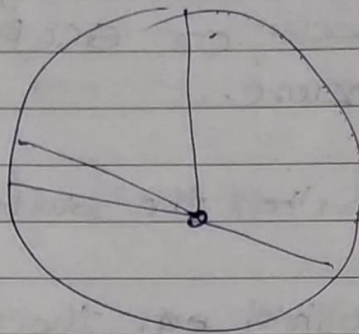
③ Scatter Plot:



④ Box Plots:



⑤ Pie Chart:



⑥ Heatmaps.

⑦ MRI & CT Imgs.

⑧ Ultrasound Img.

⑨ Electrocardiogram (ECG or EKG)

⑩ Flowchart & Diagram.

⑪ 3D Model.

⑫ GIS Maps.

⑬ Sankey Diagrams.

Q3) How visual analytics is performed in healthcare
⇒ Visual analytics in healthcare involves using interactive visualizations to explore, analyse & gain insights from complex healthcare data.

① Data Collection & Integration.

Collect data from various sources like webst, API

② Data Preprocessing

Process the collected data, remove anomalies, & noise, make it in standard form.

③ Data Visuals

Visualize the data to get more knowledge about it then perform EDA on it.

④ Predictive Analytics:

Develop predictive ML model to forecast disease outbreaks or patient readmissions.

⑤ Geospatial Analysis.

Use geographical visualizations to access regional healthcare disparities.

⑥ ~~Health~~ Dashboard & Reporting.

Develop interactive dashboard that shows custom reports.

Q4) Suppose that a hospital wants to publish patient-specific records for analysis. ...

① DATA Aggregation:

aggregate data to present statistics or summaries instead of individual records.

eg: Avg, median, etc.

② Data Generalization.

Replace specific values with more generalized categories or ranges. This reduces the granularity of data.

③ Data Masking or redaction:
Remove or mask sensitive attributes or values from the data, making it impossible to identify individuals.

④ Data Swapping:
Swap the ~~Data~~ some least important data within rows.

⑤ k-Anonymity & L-Diversity:
ensure that each published record is indistinguishable from at least $k-1$ other records. (k -anonymity) & the sensitive attribute values have at least l different values (L -Diversity).