3 major types of analytics

```
                    3 major types of
                         analytics
                             │
        ┌────────────────────┼────────────────────┐
        ↓                     ↓                     ↓
   Descriptive          Predictive          Prescriptive
```
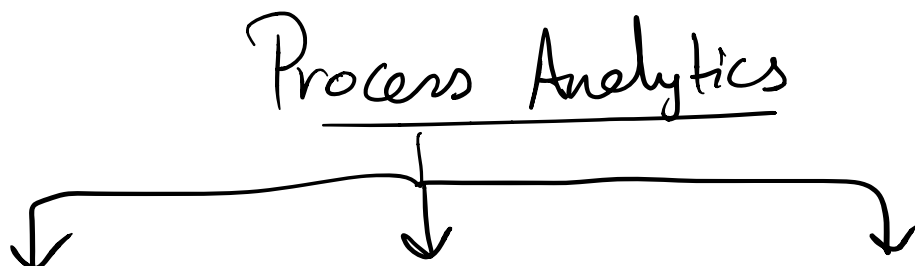
Process Analytics: Advanced Analysis of time-oriented data to derive new insights.

Applying Process Analytics to healthcare :-

~~time-oriented data to derive new insights.~~ In healthcare, one can define this process of a patient as the different steps, treatments and drugs he takes, which is sometimes also referred to as the patient's 'care journey'. ~~In general, there are three main streams of~~

Process Analytics

```
              Process Analytics
                      │
        ┌─────────────┼─────────────┐
        ↓             ↓             ↓
```

Process Discovery

- Descriptive technique to evaluate patients health-care steps, timing and duration of medical services & possibly the medical resources involved.
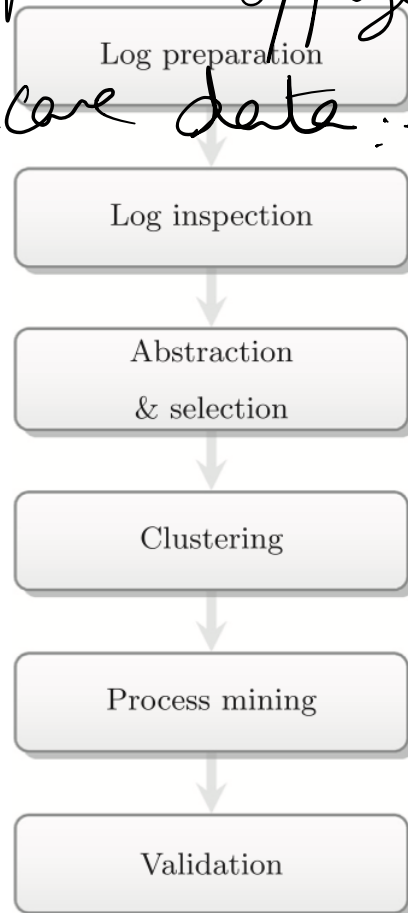
Conformance Analysis

- Adherence to guidelines & regulations

Process Extension

- Enhances an existing process model

Eg: Clinical pathway

6 steps to applying PA in healthcare data :-

```
Log preparation
        ↓
Log inspection
        ↓
Abstraction
& selection
        ↓
Clustering
        ↓
Process mining
        ↓
Validation
```

1. Aggregate data from different sources into one event log

2. Apply statistics & simple PA techniques → Goal of this step is to understand the dataset, limitations, and opportunities

   — Helps for finding large abnormalities.

   — Can also visualize data using basic statistics

3. Necessary for Unstructured processes.

Abstraction helps focus on significant aspects of a process & omit irrelevant details.

* Pattern abstraction is a technique of selecting data based on patterns of interest

* Cluster mining — identify activities that always happen in series and share some characteristics

4. Organization of data based on characteristics by use of

Segments

```
              /                    \
      Sequence              Trace
      Clustering            Clustering

    – Focuses only        – Cluster
      on sequence           data based
      of activities         on trace
      in traces             profiles
      & creates
      more simple         eg: Activities
      models
                          or Certain
                          sequence of
                          activities
```

Clustering not only allows to discover more comprehensible models but also allows to identify or confirm subgroups based upon their behavior.

5. Getting a comprehensible

outcome from the sorted date.

* Proposed techniques :-

Dotted chart analysis & fuzzy miner

results

6. Must validate date by experts (must be involved

* throughout the process)

Questions :-

Q) What they didn't do?

A) Harness NLP to abstract highly temporal data

* Not a analytical engine
  Fixed analysis
* No recommendations were
  given as a result
  from analysis.