

# EPIDEMAI (ENG)

2023

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By Documentation: Pınar Topuz

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# Project Name: Modeling and Prediction of Disease Outbreaks

## Aim:

This project is a data awareness project that aims to analyze disease outbreaks and predict future trends. The main purpose of our project is to collect, analyze and visualize data on disease outbreaks and to predict the future course of epidemics using epidemiological models. These projections will provide guidance on planning health services, taking emergency measures and optimizing resource allocation.

## Technologies Used Programming Language::

- Python Data Analysis Libraries: Pandas, NumPy
- Data Visualization Libraries: Matplotlib, Seaborn
- Machine Learning Libraries: Scikit-learn, TensorFlow

## Project Structure:

### Step 1: Data Collection and Preparation

We identified data sources: Health organizations, World Health Organization, etc. We collected and cleaned datasets: Filled in missing data, outliers will be addressed.

### Step 2: Data Visualization

We analyzed the basic statistics: The mean, median, standard deviation will be calculated. We did a time series analysis: The number of cases and deaths will be visualized with a time graph. We created geographic visualizations: It will show the geographical distribution of the epidemic with maps.

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## Step 3: Model Development

Epidemiological Model Selection: The SEIR model has been selected and the equations will be determined.

Data-Based Parameter Estimates: Model parameters will be adapted to the data. Machine Learning and

Artificial Intelligence: Prediction models will be developed using machine learning algorithms.

## Step 4: Evaluation of Model Evaluation and Improvement Estimation

### Performance:

Model performance will be measured with error metrics. Model Improvement: Parameter adjustments and alternative algorithms will be tried.

## Step 5: Reporting and Presentation

Detailed Documentation: Jupyter Notebook will be documented with content and step-by-step

explanations. Support with Visuals and Diagrams: Images and diagrams will be added to support the project.

## Step 6: Presentation Preparation

Creating Effective Presentations: An effective presentation will be prepared for technology organizations.

Answering Questions: You will be prepared for the questions that may come during the presentation.

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