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Heart Disease

**Outline**

Cardiovascular diseases are the primary cause of mortality worldwide. Timely recognition of heart attack indicators and comprehension of the physiological symptoms that could signal an imminent heart attack can drastically enhance survival rates and mitigate heart attack risks. This project proposes to explore these elements using data analytics and machine learning methodologies.

**Research Questions**

1. Is it possible to identify symptoms of heart attack before it occurs?
2. What are the physiological symptoms that could suggest an imminent heart attack diagnosis?
3. Are heart attacks more common in men or women?
4. What age bracket is more at risk for heart disease?

**Data Sources**

We will utilize datasets from credible health organizations and research studies. These datasets should encompass demographic data, medical history, lifestyle factors, and physiological metrics.

1. **Demographic Data**: Age, gender, ethnicity.
2. **Medical Records**: Prior diagnoses, familial history of heart disease.
3. **Lifestyle Elements**: Tobacco use status, level of physical activity, dietary patterns.
4. **Physiological Metrics**: Blood pressure readings, cholesterol levels, body mass index (BMI).

**Tasks Breakdowns**

The project will be divided into several tasks:

* **Task 1 - Data Acquisition**: Collect datasets from diverse sources.
* **Task 2 - Data Cleaning**: Cleanse the data and manage missing values.
* **Task 3 - Exploratory Data Analysis (EDA)**: Comprehend the distribution of data and identify potential correlations.
* **Task 4 - Feature Generation**: Develop new features that might enhance the predictive capacity of our models.
* **Task 5 - Model Development**: Train various machine learning models using cross-validation techniques.
* **Task 6 - Model Assessment**: Evaluate the performance of models using suitable metrics (e.g., accuracy, precision, recall).
* **Task 7 - Result Interpretation**: Understand what the predictions of the model imply in relation to our research queries.

Through this project, we aim to uncover insights into predicting heart attacks and contribute to preventative measures in healthcare.