📉 1. ST Depression Induced by Exercise Relative to Rest

💡 What it is:

- This refers to how much the ST segment drops (depresses) on an ECG during exercise compared to rest.
- The ST segment represents the time between ventricular contraction and repolarization (recovery).
- A depression suggests reduced blood flow (ischemia).

📏 Value Range:

- Usually a continuous value from 0.0 to ~6.2 mm in medical datasets like the UCI Heart dataset.

ST Depression (mm)	Interpretation
0.0	No ischemia
0.1 – 1.0	Mild ST depression
>1.0	Suggestive of myocardial ischemia
>2.0 – 6.2	Strongly abnormal, high risk

🧠 Higher the ST depression, more likely there's a blockage or narrowing in the coronary arteries.

📈 2. Slope of the Peak Exercise ST Segment

💡 What it is:

- Describes the direction of the ST segment after peak exercise:
    - Is it rising, flat, or falling?
- Gives clues about how well the heart handles physical stress.

📄 Types:

Slope Type	What It Means	Risk Level
Upsloping	ST segment goes up slightly after QRS complex	✅ Normal or least risky
Flat	ST segment remains level (no rise)	⚠️ Possible ischemia
Downsloping	ST segment goes down after QRS complex	🚨 Strong sign of ischemia or blockage

🔢 Encoded as (in datasets):

Slope Type	Numeric Code
Upsloping	1
Flat	2
Downsloping	3

🧠 Why These Matter in Heart Disease Prediction:

These features are powerful indicators of heart problems. A combination like:

- ST depression > 1.5 mm
- Downsloping ST segment
- Exercise-induced angina

...makes it highly likely the patient has coronary artery disease (CAD).

Let me know if you want:

- Help visualizing ST segment changes
- Feature engineering ideas for your ML model
- Interpretation with real dataset values