**Hypothesis 1: Patients with higher cholesterol levels and higher resting blood pressure are more likely to have chest pain (angina).**

* **Variables to consider**:
  + **Resting blood pressure** (resting\_blood\_pressure)
  + **Serum cholesterol levels** (cholesterol)
  + **Chest pain type** (chest\_pain\_type)
* **Rationale**: Elevated cholesterol levels can lead to plaque buildup in arteries, causing heart disease. High blood pressure also puts additional strain on the heart. These conditions may contribute to the likelihood of chest pain during physical exertion or at rest.
* **Test**: Perform a correlation analysis and statistical tests (e.g., ANOVA or chi-square) to examine whether higher cholesterol and blood pressure are significantly associated with more severe types of chest pain.

**Hypothesis 2: Older patients are more likely to have exercise-induced angina and abnormal ST depression levels.**

* **Variables to consider**:
  + **Age** (age)
  + **Exercise-induced angina** (exercise\_induced\_angina)
  + **ST depression induced by exercise relative to rest** (oldpeak)
* **Rationale**: As age increases, the likelihood of cardiovascular issues, including angina and abnormal heart responses to exercise, typically rises. This hypothesis aims to see if there is a significant correlation between age and exercise-related heart issues.
* **Test**: Use logistic regression to predict the presence of exercise-induced angina based on age and ST depression values. You can also perform t-tests or ANOVA to compare age groups.

**Hypothesis 3: Male patients with high fasting blood sugar are more likely to experience heart disease symptoms (chest pain, abnormal ECG results) compared to female patients.**

* **Variables to consider**:
  + **Sex** (sex)
  + **Fasting blood sugar > 120 mg/dl** (fasting\_blood\_sugar)
  + **Chest pain type** (chest\_pain\_type)
  + **Resting electrocardiographic results** (resting\_ecg\_results)
* **Rationale**: Males are typically at higher risk of developing cardiovascular diseases, and high fasting blood sugar levels are a strong indicator of metabolic syndrome, which increases the risk of heart disease.
* **Test**: You can conduct a chi-square test or logistic regression to test whether males with high fasting blood sugar have a higher incidence of chest pain or abnormal ECG results compared to females.

**Hypothesis 4: Patients with a greater number of major vessels colored by fluoroscopy have lower maximum heart rates achieved during exercise.**

* **Variables to consider**:
  + **Number of major vessels (0-3) colored by fluoroscopy** (num\_major\_vessels)
  + **Maximum heart rate achieved** (max\_heart\_rate)
* **Rationale**: Patients with more blocked vessels (as identified by fluoroscopy) are likely to have reduced heart function, limiting their maximum heart rate during exercise.
* **Test**: Use linear regression to test the relationship between the number of major vessels and the maximum heart rate achieved. Alternatively, use a t-test or ANOVA to see if patients with more blocked vessels have significantly lower heart rates.