Use STATDISK for the following:

1. Heights and Weights are measured for 100 randomly adult males (dataset 1 ‘Body Data’). Find the best predicted weight given an adult male who is 180 cm tall. Heights are in cm and weights are in kg.

* **Objective**: Find the best predicted weight for an adult male who is 180 cm tall.

**Steps**:

1. **Fit a Linear Regression Model**:
   * You would need to run a **simple linear regression** with **Height (cm)** as the independent variable (X) and **Weight (kg)** as the dependent variable (Y).

In STATDISK, you would:

* + Open the dataset.
  + Select **Linear Regression** under the Analysis options.
  + Choose **Height** as the independent variable and **Weight** as the dependent variable.

1. **Interpret the Output**:
   * The output will give you an equation in the form: Weight=b0+b1×Height\text {Weight} = b\_0 + b\_1 \times \text {Height}Weight=b0​+b1​×Height where b0b\_0b0​ is the intercept and b1b\_1b1​ is the slope.
2. **Predict the Weight**:
   * To predict the weight of an adult male who is 180 cm tall, simply substitute Height=180\text {Height} = 180Height=180 into the equation: Predicted Weight=b0+b1×180\text{Predicted Weight} = b\_0 + b\_1 \times 180Predicted Weight=b0​+b1​×180
   * This will give you the best predicted weight for that height.
3. Taxis (Data Set 32 ‘Taxis’). Distances are in miles, times are in minutes, fares are in dollars, tips are in dollars. Is there sufficient evidence to support the claim that there is a linear correlation between the time of the ride and the tip amount? Does it appear that riders base their tips on the time of the ride?

Find the best predicted tip for a ride that takes 20 minutes? How does this compare to the actual tip of $4.55?

* **Objective**: Determine if there is a significant linear correlation between the time of the ride (minutes) and the tip amount (dollars).

**Steps**:

1. **Check for Linear Correlation**:
   * Perform a **correlation analysis** or a **simple linear regression** with **Time (minutes)** as the independent variable and **Tip (dollars)** as the dependent variable.

In STATDISK, you would:

* + Select **Correlation** or **Linear Regression** from the Analysis menu.
  + Choose **Time** as the independent variable and **Tip** as the dependent variable.

1. **Evaluate Correlation Coefficient**:
   * The output will provide a **correlation coefficient (r)**. This value will tell you how strong the relationship is between time and tip.
     + **If r is close to +1 or -1**, there is a strong linear relationship.
     + **If r is close to 0**, there is no significant linear relationship.

To determine if the correlation is statistically significant:

* + Look at the **p-value** from the regression output.
    - If the p-value is less than your significance level (e.g., 0.05), you can conclude that there is a significant linear correlation between time and tip.

1. **Predict the Tip for a 20-minute Ride**:
   * Using the **linear regression model** from the output (i.e., the equation Tip=b0+b1×Time\text{Tip} = b\_0 + b\_1 \times \text{Time}Tip=b0​+b1​×Time), substitute 20 minutes for Time: Predicted Tip=b0+b1×20\text{Predicted Tip} = b\_0 + b\_1 \times 20Predicted Tip=b0​+b1​×20
   * Compare this predicted value with the **actual tip** of $4.55 to assess the accuracy of the model.
2. CSI stats (Data set 3 ANSURE II 2012). Foot lengths (mm), heights (mm). Is there sufficient evidence to conclude that there is a linear correlation between foot lengths and heights of males? Based on the results, does it appear that police can use footprint length sto estimate the height of a male?

Find the best predicted height of a mail with a foot length of 273 mm. How does this compare to the actual height of 1776 mm?

* **Objective**: Determine if there is a significant linear correlation between foot length (mm) and height (mm) for males.

**Steps**:

1. **Perform a Linear Regression or Correlation Analysis**:
   * Run a **linear regression** or **correlation analysis** with **Foot Length** as the independent variable and **Height** as the dependent variable.

In STATDISK, you would:

* + Choose **Linear Regression** or **Correlation** under Analysis.
  + Select **Foot Length (mm)** as the independent variable and **Height (mm)** as the dependent variable.

1. **Evaluate the Results**:
   * **Correlation Coefficient (r)**: Look for the strength of the relationship between foot length and height.
     + If rrr is close to +1, there is a strong positive relationship, meaning that as foot length increases, height increases.
     + If rrr is closer to 0, there may not be a significant correlation.
   * **P-Value**: Check the p-value to see if the correlation is statistically significant. A p-value less than 0.05 suggests significant evidence to support a linear relationship.
2. **Predict the Height for a Foot Length of 273 mm**:
   * Using the regression equation Height=b0+b1×Foot Length\text{Height} = b\_0 + b\_1 \times \text{Foot Length}Height=b0​+b1​×Foot Length, substitute **Foot Length = 273 mm** into the equation: Predicted Height=b0+b1×273\text{Predicted Height} = b\_0 + b\_1 \times 273Predicted Height=b0​+b1​×273
   * Compare this predicted height with the **actual height** of 1776 mm to assess how well the model predicts height based on foot length.