Chapter 6

# Applying the Concepts: StatCrunch Instructions

## Relate Variability to Uncertainty and Predictability

StatCrunch functionality projected for 2025.

## Estimating Likelihood of Values in Data

Create Histogram

1. Open penguins.csv in StatCrunch
2. Graph→Histogram
3. Select Columns: body\_mass\_g
4. Click Compute!

Compute Probability Estimates:

Compute the proportion of penguins with body\_mass\_g between 3500 and 5500

1. Stat → Summary Stats → Columns
2. Select Columns: body\_mass\_g
3. In the “Where:” box, enter:

*body\_mass\_g<=5500 and body\_mass\_g>=3500*

1. Statistics → n
2. Click Compute!
3. Divide your resulting number by the number of rows in the table (333)

Compute the proportion of penguins with body\_mass\_g of at least 6000

1. Stat → Summary Stats → Columns
2. Select Columns: body\_mass\_g
3. In the “Where:” box, enter:

*body\_mass\_g>=6000*

1. Statistics → n
2. Click Compute!
3. Divide your resulting number by the number of rows in the table (333)

## Predictability From Histograms

Create Histogram

1. Open the skeeball.csv data in StatCrunch
2. Graph → Histogram
3. Select column(s) → scores
4. Group by → person
5. Click Compute!

Calculate Average Scores

1. Stat → Summary Stats → Columns
2. Select Columns → scores
3. Group by → person
4. Statistics → Select Mean
5. Click Compute!

Compute Probability Estimates

1. Stat → Summary Stats → Columns
2. Select columns → scores
3. In the “Where:” box, enter:

*scores>400*

1. Group by → person
2. Statistics → Select n
3. Click Compute!
4. Divide each of the resulting values by 1,000

## Predictability with Two Variables

1. Open the treats\_hour\_age.csv dataset in StatCrunch.
2. Graph→Scatter Plot.
3. X Variable → day\_hour.
4. Y Variable → treats.
5. Click Compute!
6. Repeat steps 2-5 for the age and treats variables

## Estimation from Different Sampling Methods

Calculate Statistics for Simple Random Sample

1. Open student\_gpa\_srs.csv file in StatCrunch
2. Stat → Summary Stats → Columns
3. Select Columns → gpa
4. Group by → class
5. Statistics → n, Mean
6. Click Compute!
7. Stat → Summary Stats → Columns
8. Select columns → gpa
9. Statistics → Select Mean
10. Click Compute!

Calculate Statistics for Stratified Random Sample

1. Open student\_gpa\_strat.csv file in StatCrunch
2. Stat → Summary Stats → Columns
3. Select Columns → gpa
4. Group by → class
5. Statistics → n, Mean
6. Click Compute!
7. Stat → Summary Stats → Columns
8. Select columns → gpa
9. Statistics → Select Mean
10. Click Compute!

Calculate Statistics for Balance Stratified Random Sample

1. Open student\_gpa\_bal\_strat.csv file in StatCrunch
2. Stat → Summary Stats → Columns
3. Select Columns → gpa
4. Group by → class
5. Statistics → n, Mean
6. Click Compute!
7. Stat → Summary Stats → Columns
8. Select columns → gpa
9. Statistics → Select Mean
10. Click Compute!

## Simulate Flipping a Loaded Coin

StatCrunch functionality projected for 2025.

## Simulate Samples

Simulate distribution for sample size 30:

1. Open StatCrunch
2. Applets → Simulation → Coin Flipping
3. Probability of Heads → 18/38
4. Number of coins: 30
5. Under “Tally heads in tosses:”
   1. Click “Proportion”
   2. Select “>=”
   3. Enter 0 in the box to the right
6. Click Compute!
7. Click “1000 runs”

Simulate distribution for sample size 100:

1. Open StatCrunch
2. Applets → Simulation → Coin Flipping
3. Probability of Heads → 18/38
4. Number of coins: 100
5. Under “Tally heads in tosses:”
   1. Click “Proportion”
   2. Select “>=”
   3. Enter 0 in the box to the right
6. Click Compute!
7. Click “1000 runs”

Simulate distribution for sample size 1000:

1. Open StatCrunch
2. Applets → Simulation → Coin Flipping
3. Probability of Heads → 18/38
4. Number of coins: 1000
5. Under “Tally heads in tosses:”
   1. Click “Proportion”
   2. Select “>=”
   3. Enter 0 in the box to the right
6. Click Compute!
7. Click “1000 runs”
8. Observe all three distributions and compare.