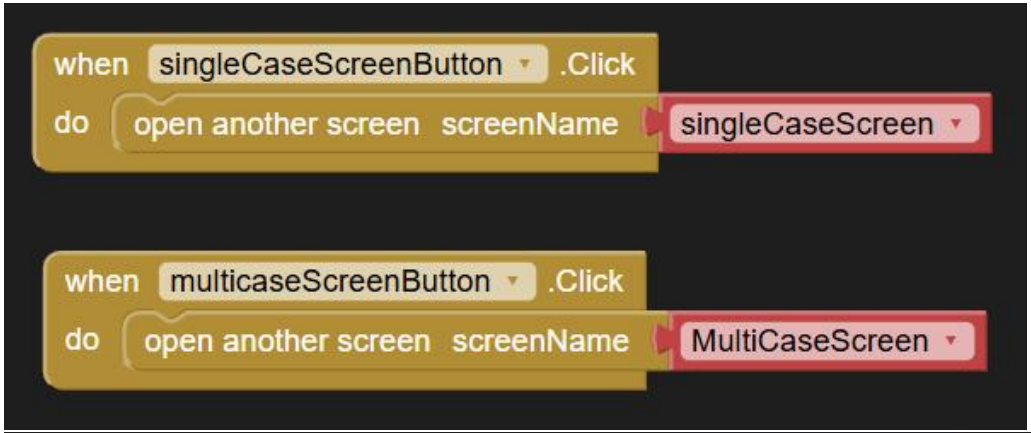
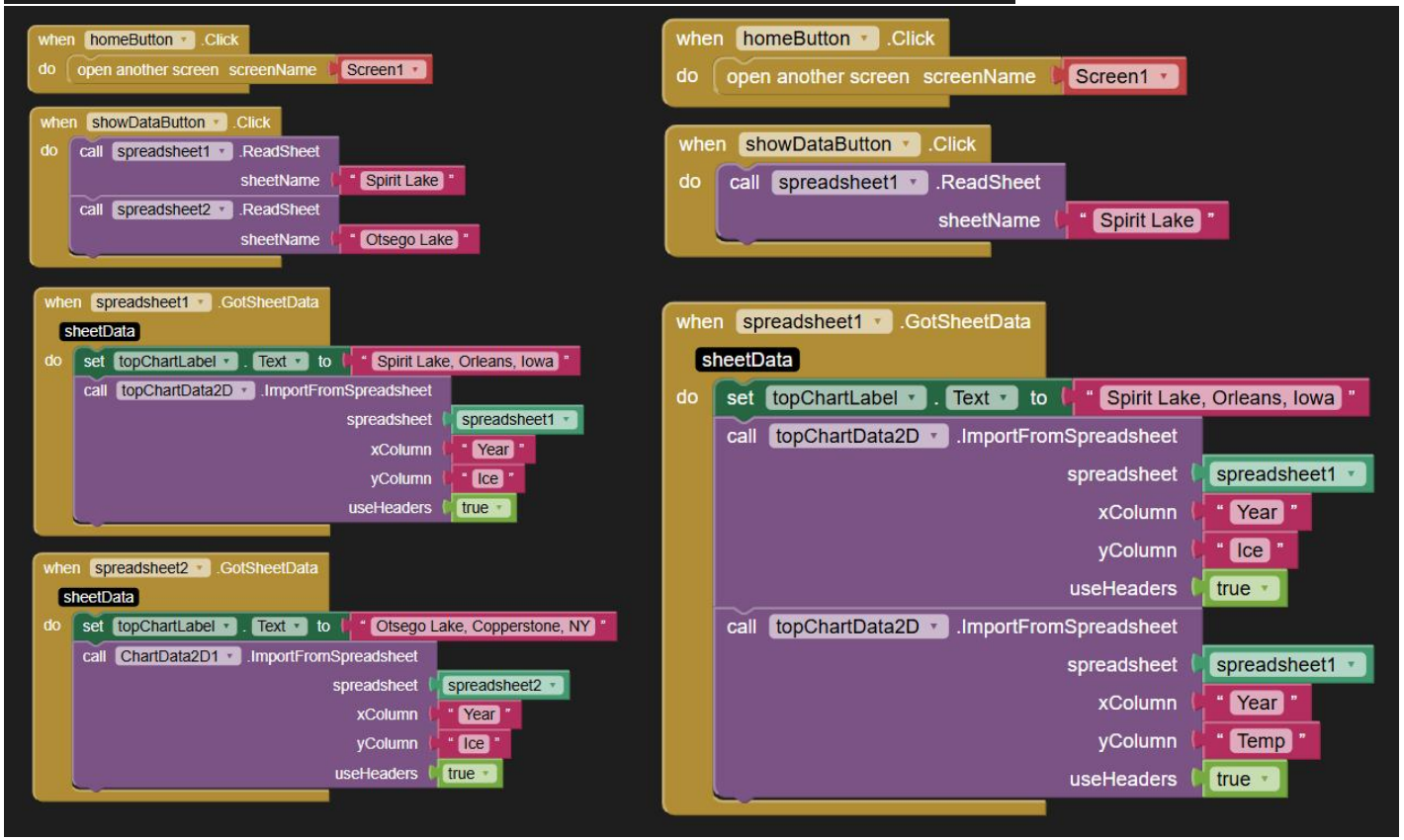
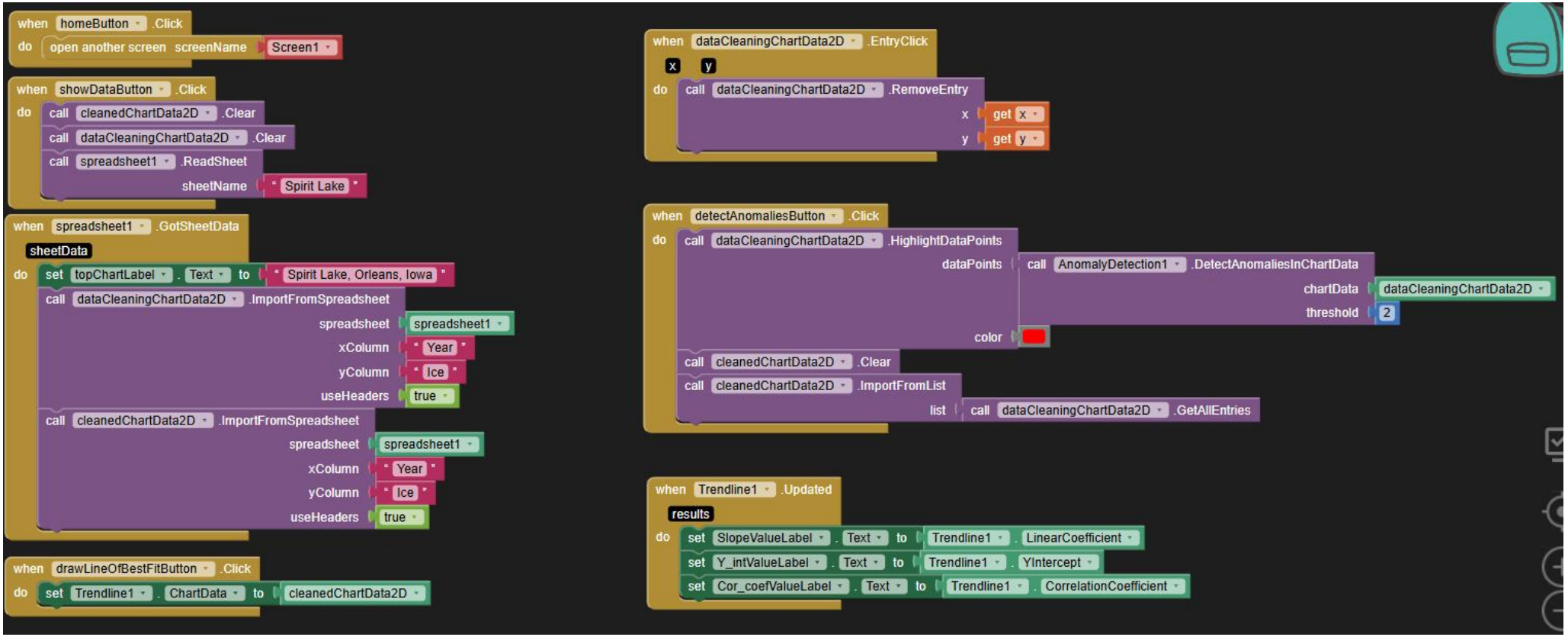
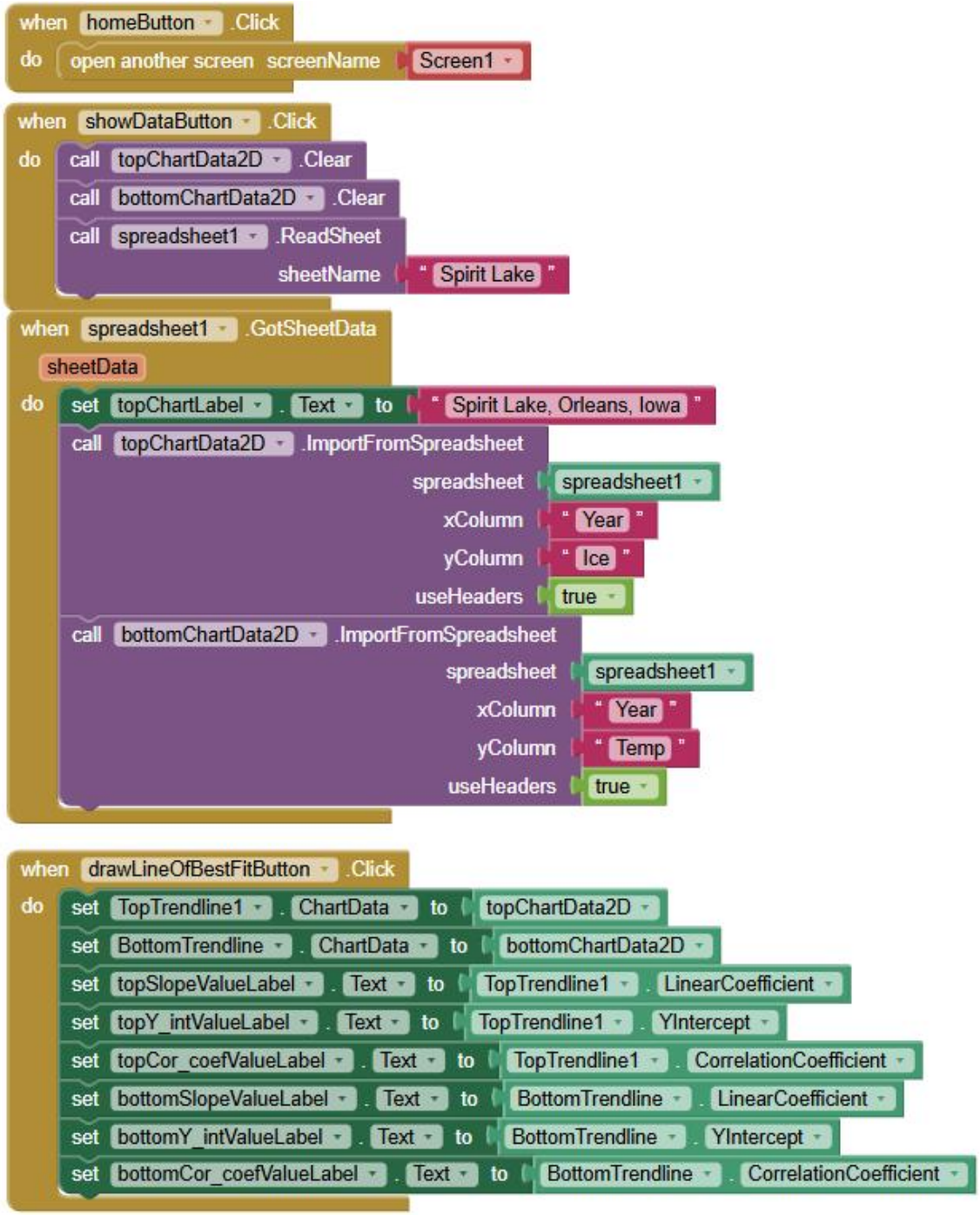
STEP 1


when singleCaseScreenButton .Click
do open another screen screenName singleCaseScreen
when multicaseScreenButton .Click
do open another screen screenName MultiCaseScreen

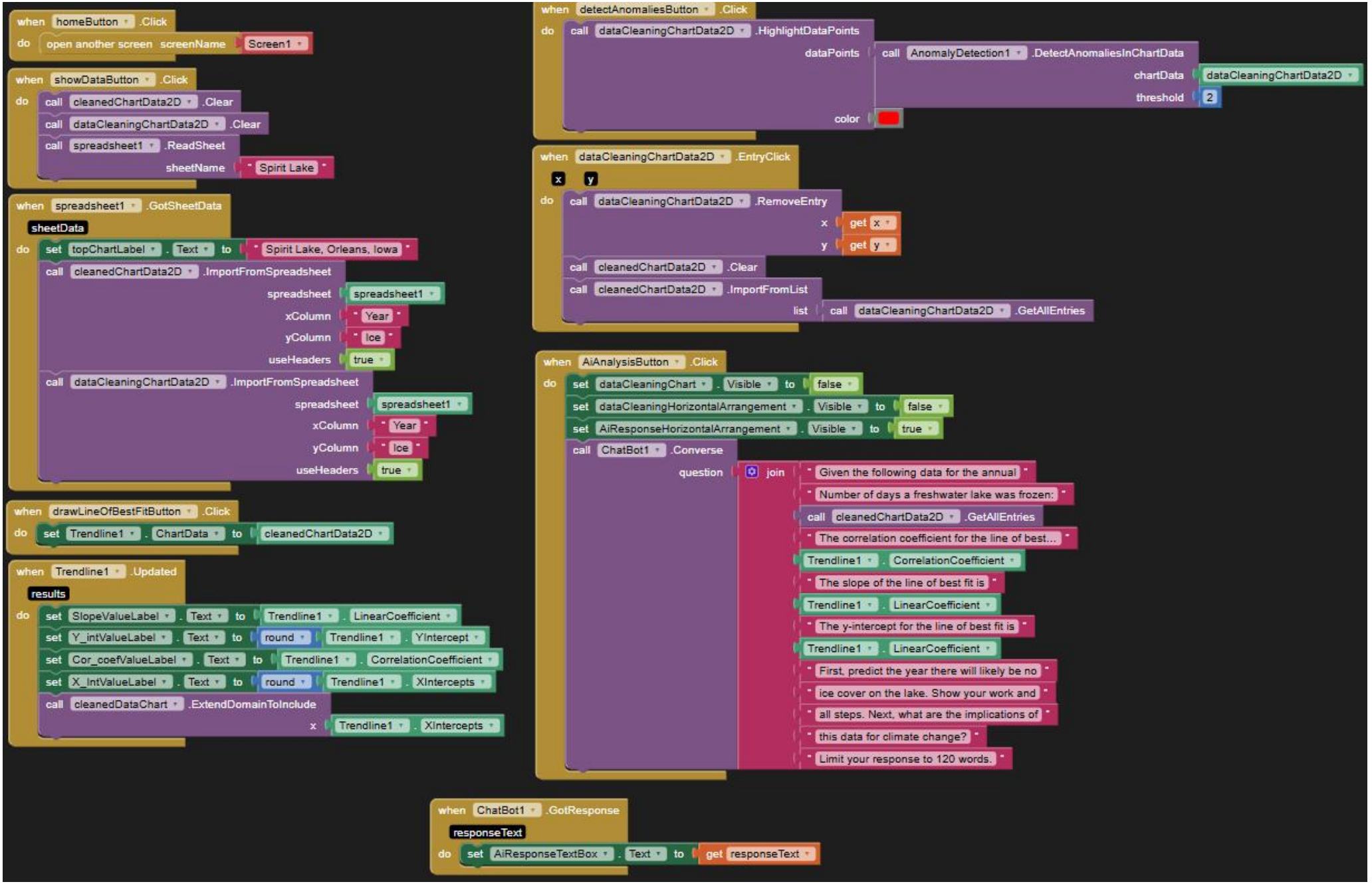

when homeButton .Click
do open another screen screenName Screen1
when showDataButton .Click
do call spreadsheet1 .ReadSheet
sheetName " Spirit Lake "
call spreadsheet2 .ReadSheet
sheetName " Otsego Lake "
when spreadsheet1 .GotSheetData
sheetData
do set topChartLabel . Text to " Spirit Lake, Orleans, Iowa "
call topChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Ice "
useHeaders true
when spreadsheet2 .GotSheetData
sheetData
do set topChartLabel . Text to " Otsego Lake, Copperstone, NY "
call ChartData2D1 .ImportFromSpreadsheet
spreadsheet spreadsheet2
xColumn " Year "
yColumn " Ice "
useHeaders true
when homeButton .Click
do open another screen screenName Screen1
when showDataButton .Click
do call spreadsheet1 .ReadSheet
sheetName " Spirit Lake "
when spreadsheet1 .GotSheetData
sheetData
do set topChartLabel . Text to " Spirit Lake, Orleans, Iowa "
call topChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Ice "
useHeaders true
call topChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Temp "
useHeaders true

STEP 2 & 3


when homeButton .Click
do open another screen screenName Screen1
when showDataButton .Click
do call cleanedChartData2D .Clear
call dataCleaningChartData2D .Clear
call spreadsheet1 .ReadSheet
sheetName " Spirit Lake "
when spreadsheet1 .GotSheetData
sheetData
do set topChartLabel . Text to " Spirit Lake, Orleans, Iowa "
call dataCleaningChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Ice "
useHeaders true
call cleanedChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Ice "
useHeaders true
when drawLineOfBestFitButton .Click
do set Trendline1 . ChartData to cleanedChartData2D
when dataCleaningChartData2D .EntryClick
x y
do call dataCleaningChartData2D .RemoveEntry
x get x
y get y
when detectAnomaliesButton .Click
do call dataCleaningChartData2D .HighlightDataPoints
dataPoints call AnomalyDetection1 .DetectAnomaliesInChartData
chartData dataCleaningChartData2D
threshold 2
color
call cleanedChartData2D .Clear
call cleanedChartData2D .ImportFromList
list call dataCleaningChartData2D .GetAllEntries
when Trendline1 .Updated
results
do set SlopeValueLabel . Text to Trendline1 . LinearCoefficient
set Y_intValueLabel . Text to Trendline1 . YIntercept
set Cor_coefValueLabel . Text to Trendline1 . CorrelationCoefficient


when homeButton .Click
do open another screen screenName Screen1
when showDataButton .Click
do call topChartData2D .Clear
call bottomChartData2D .Clear
call spreadsheet1 .ReadSheet
sheetName " Spirit Lake "
when spreadsheet1 .GotSheetData
sheetData
do set topChartLabel . Text to " Spirit Lake, Orleans, Iowa "
call topChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Ice "
useHeaders true
call bottomChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Temp "
useHeaders true
when drawLineOfBestFitButton .Click
do set TopTrendline1 . ChartData to topChartData2D
set BottomTrendline . ChartData to bottomChartData2D
set topSlopeValueLabel . Text to TopTrendline1 . LinearCoefficient
set topY_intValueLabel . Text to TopTrendline1 . YIntercept
set topCor_coefValueLabel . Text to TopTrendline1 . CorrelationCoefficient
set bottomSlopeValueLabel . Text to BottomTrendline . LinearCoefficient
set bottomY_intValueLabel . Text to BottomTrendline . YIntercept
set bottomCor_coefValueLabel . Text to BottomTrendline . CorrelationCoefficient

STEP 4


when homeButton .Click
do open another screen screenName Screen1
when showDataButton .Click
do call cleanedChartData2D .Clear
call dataCleaningChartData2D .Clear
call spreadsheet1 .ReadSheet
sheetName " Spirit Lake "
when spreadsheet1 .GotSheetData
sheetData
do set topChartLabel . Text to " Spirit Lake, Orleans, Iowa "
call cleanedChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Ice "
useHeaders true
call dataCleaningChartData2D .ImportFromSpreadsheet
spreadsheet spreadsheet1
xColumn " Year "
yColumn " Ice "
useHeaders true
when drawLineOfBestFitButton .Click
do set Trendline1 . ChartData to cleanedChartData2D
when Trendline1 .Updated
results
do set SlopeValueLabel . Text to Trendline1 . LinearCoefficient
set Y_intValueLabel . Text to round Trendline1 . YIntercept
set Cor_coefValueLabel . Text to Trendline1 . CorrelationCoefficient
set X_IntValueLabel . Text to round Trendline1 . XIntercepts
call cleanedDataChart .ExtendDomainToInclude
x Trendline1 . XIntercepts
when detectAnomaliesButton .Click
do call dataCleaningChartData2D .HighlightDataPoints
dataPoints call AnomalyDetection1 .DetectAnomaliesInChartData
chartData dataCleaningChartData2D
threshold 2
color
when dataCleaningChartData2D .EntryClick
x y
do call dataCleaningChartData2D .RemoveEntry
x get x
y get y
call cleanedChartData2D .Clear
call cleanedChartData2D .ImportFromList
list call dataCleaningChartData2D .GetAllEntries
when AiAnalysisButton .Click
do set dataCleaningChart . Visible to false
set dataCleaningHorizontalArrangement . Visible to false
set AiResponseHorizontalArrangement . Visible to true
call ChatBot1 .Converse
question join " Given the following data for the annual "
" Number of days a freshwater lake was frozen: "
call cleanedChartData2D .GetAllEntries
" The correlation coefficient for the line of best... "
Trendline1 . CorrelationCoefficient
" The slope of the line of best fit is "
Trendline1 . LinearCoefficient
" The y-intercept for the line of best fit is "
Trendline1 . LinearCoefficient
" First, predict the year there will likely be no "
" ice cover on the lake. Show your work and "
" all steps. Next, what are the implications of "
" this data for climate change? "
" Limit your response to 120 words. "
when ChatBot1 .GotResponse
responseText
do set AiResponseTextBox . Text to get responseText

8:11 68 %

Climate Data Predictions

Choose a Procedure:

Draw Line of Best Fit | Clean Data

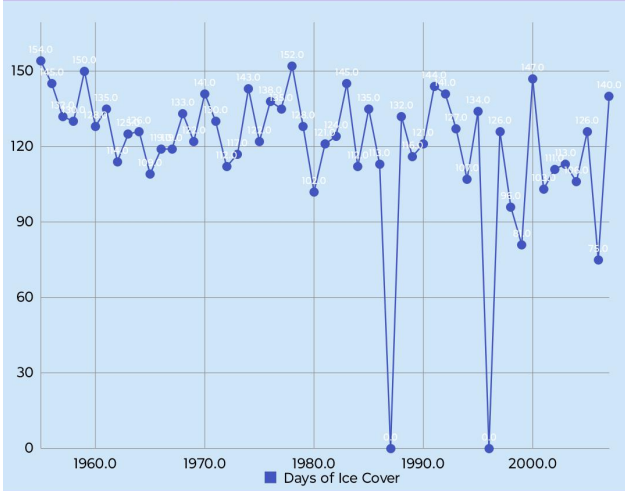
Make Predictions

8:11 68 %

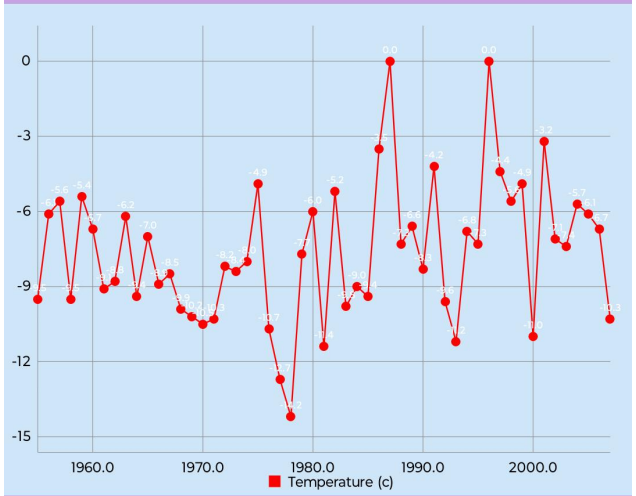
Climate Data: Create a Model

Home | Show Data | Draw Line of Best Fit

Spirit Lake, Orleans, Iowa



M = B = R =



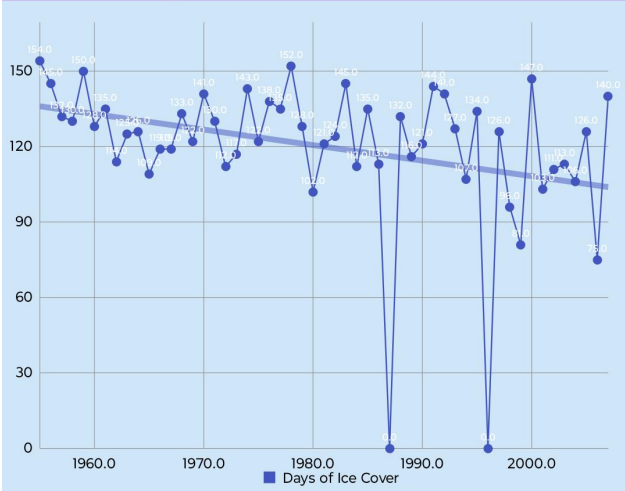
M = B = R =

8:11 68 %

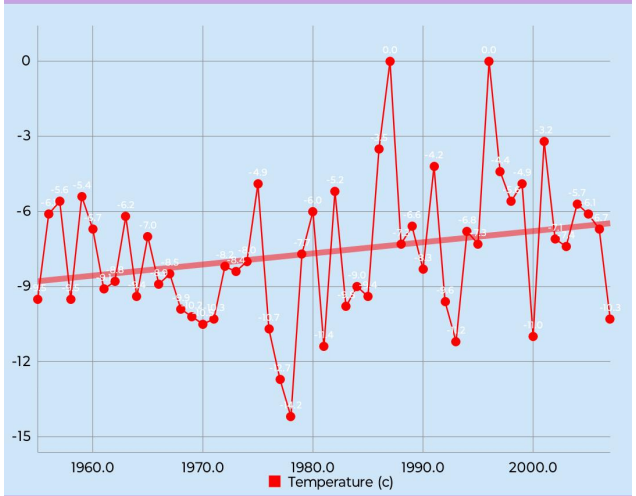
Climate Data: Create a Model

Home | Show Data | Draw Line of Best Fit

Spirit Lake, Orleans, Iowa

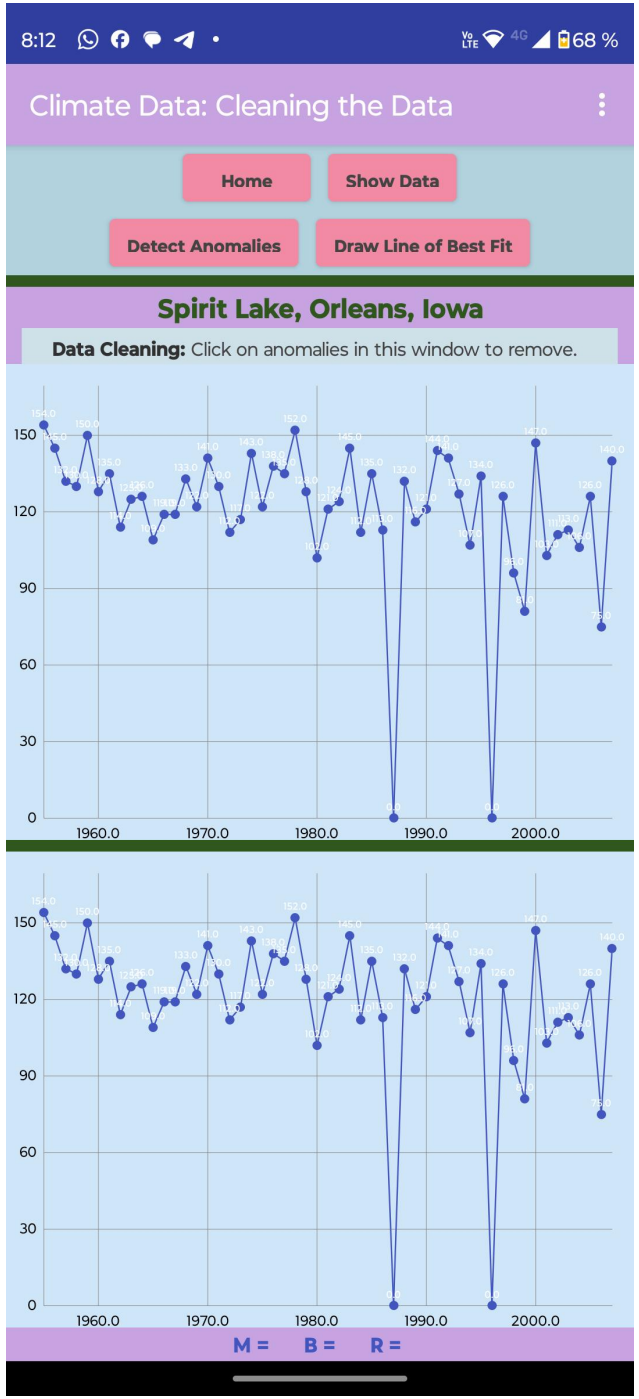


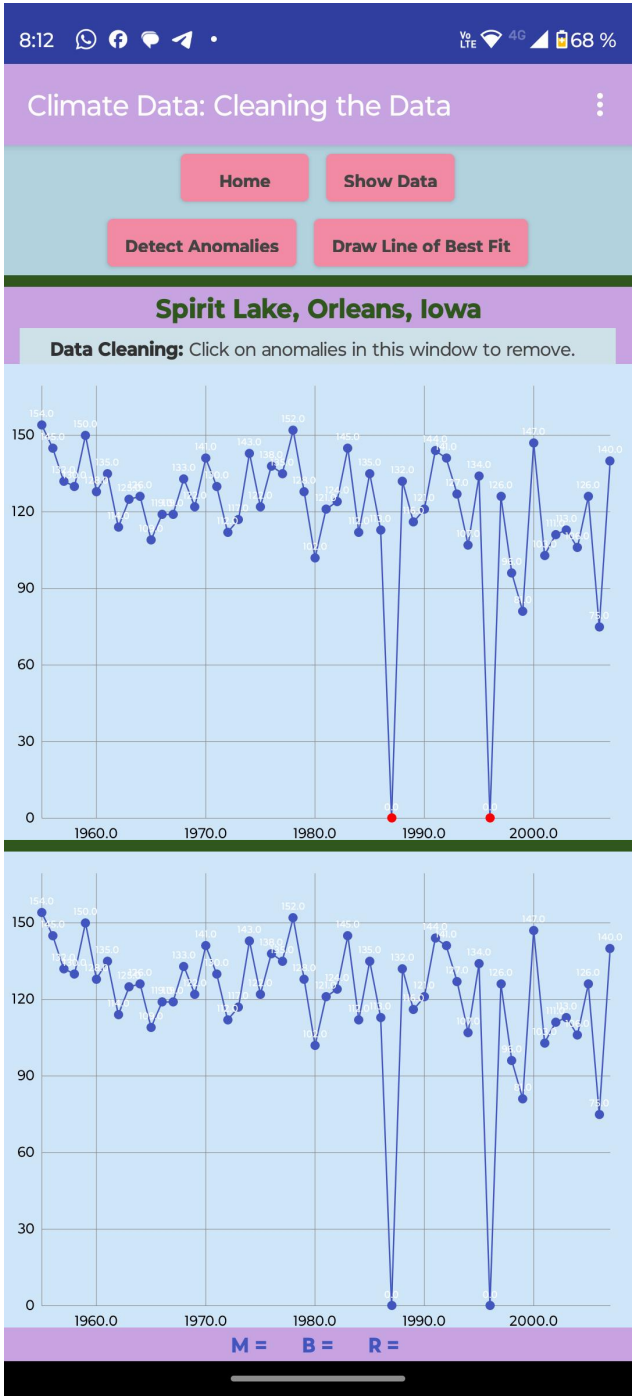
M = -0.6178 B = 1343.81229 R = -0.3279



M = 0.04448 B = -95.7545 R = 0.245


8:12
68 %
Climate Data: Cleaning the Data
Home
Show Data
Detect Anomalies
Draw Line of Best Fit
Data Cleaning: Click on anomalies in this window to remove.
M =
B =
R =


8:12
68 %
Climate Data: Cleaning the Data
Home
Show Data
Detect Anomalies
Draw Line of Best Fit
Spirit Lake, Orleans, Iowa
Data Cleaning: Click on anomalies in this window to remove.
150
120
90
60
30
0
1960.0
1970.0
1980.0
1990.0
2000.0
M =
B =
R =


8:12
68 %
Climate Data: Cleaning the Data
Home
Show Data
Detect Anomalies
Draw Line of Best Fit
Spirit Lake, Orleans, Iowa
Data Cleaning: Click on anomalies in this window to remove.
150
120
90
60
30
0
1960.0
1970.0
1980.0
1990.0
2000.0
M =
B =
R =

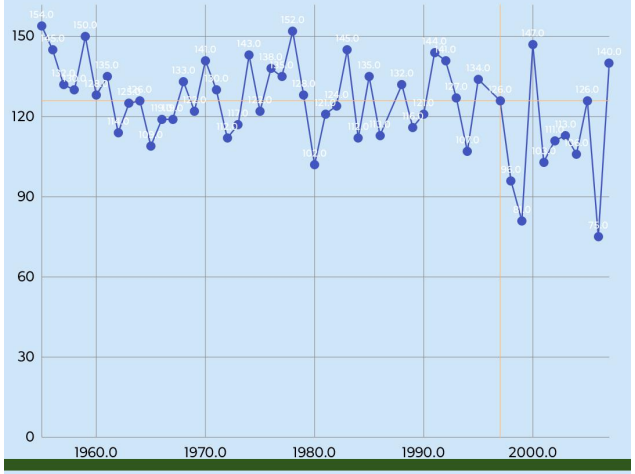
8:12 68 %

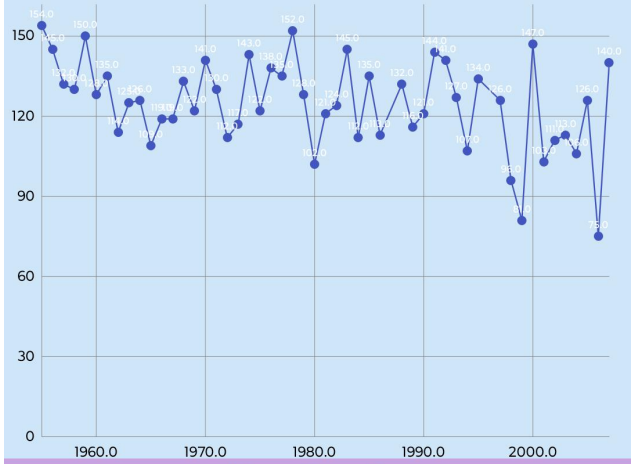
Climate Data: Cleaning the Data

Home | Show Data | Detect Anomalies | Draw Line of Best Fit

Spirit Lake, Orleans, Iowa

Data Cleaning: Click on anomalies in this window to remove.





M = B = R =

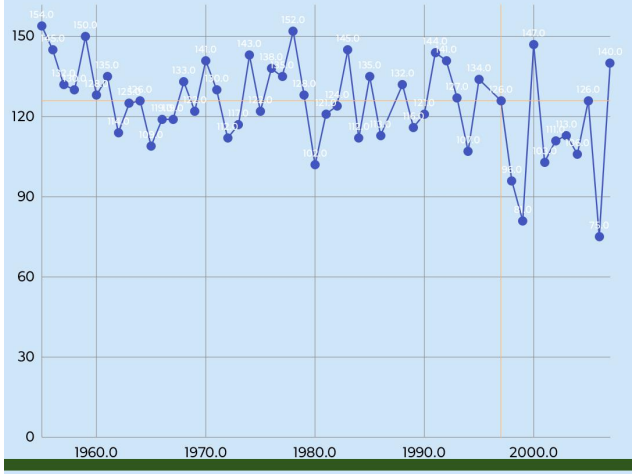
8:12 68 %

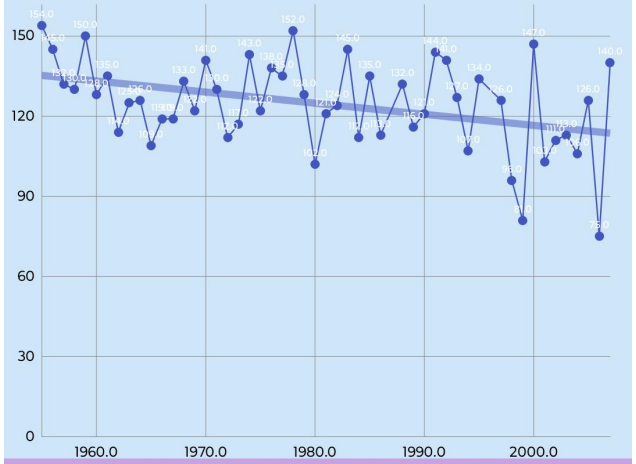
Climate Data: Cleaning the Data

Home | Show Data | Detect Anomalies | Draw Line of Best Fit

Spirit Lake, Orleans, Iowa

Data Cleaning: Click on anomalies in this window to remove.





M = -0.41578 B = 948.13964 R = -0.38536

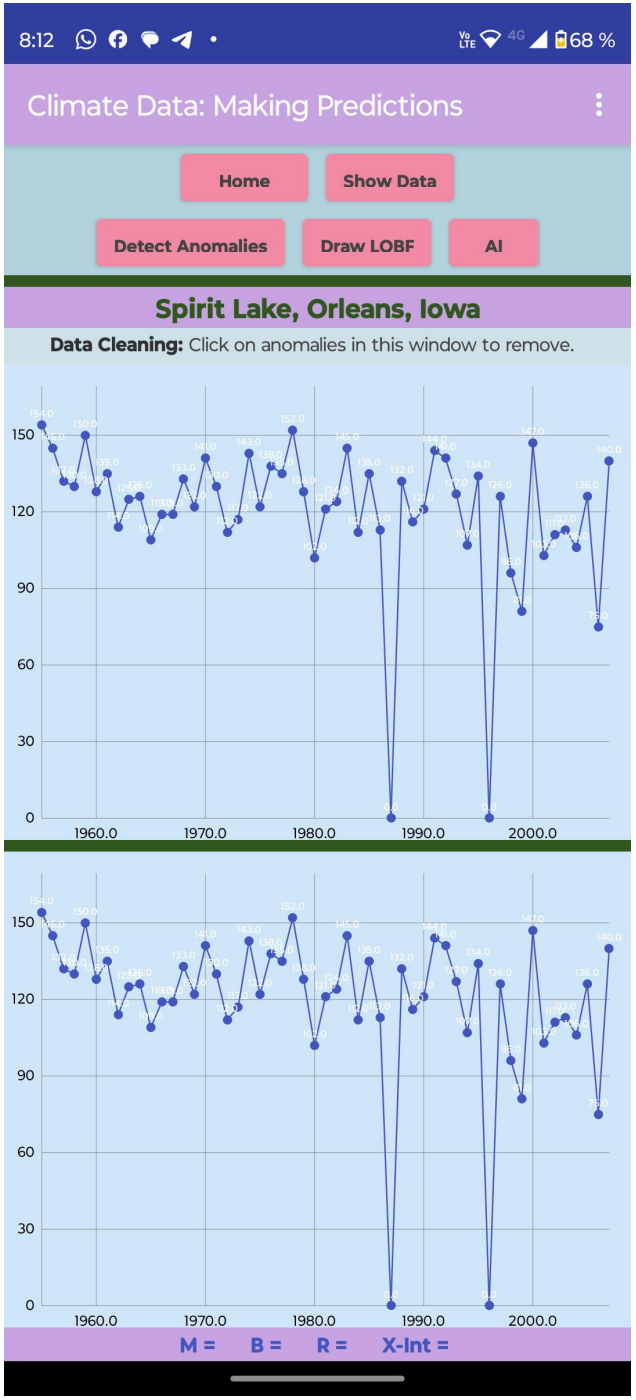
8:12 68 %

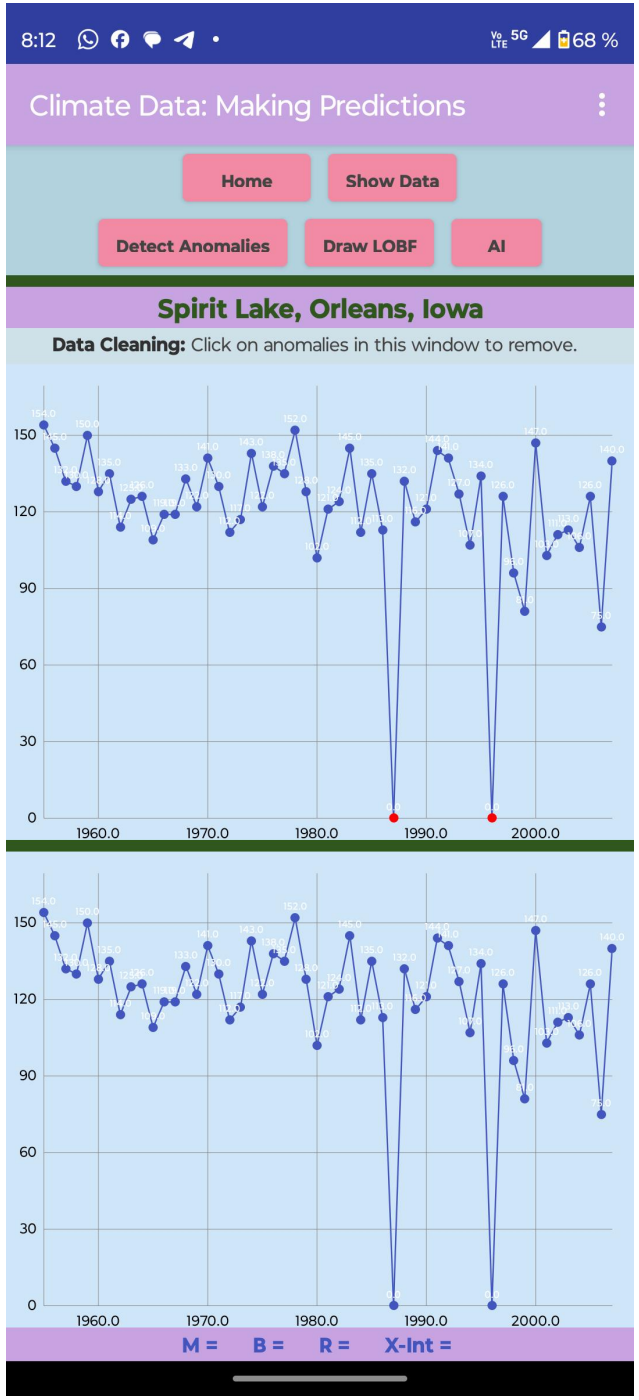
Climate Data: Making Predictions

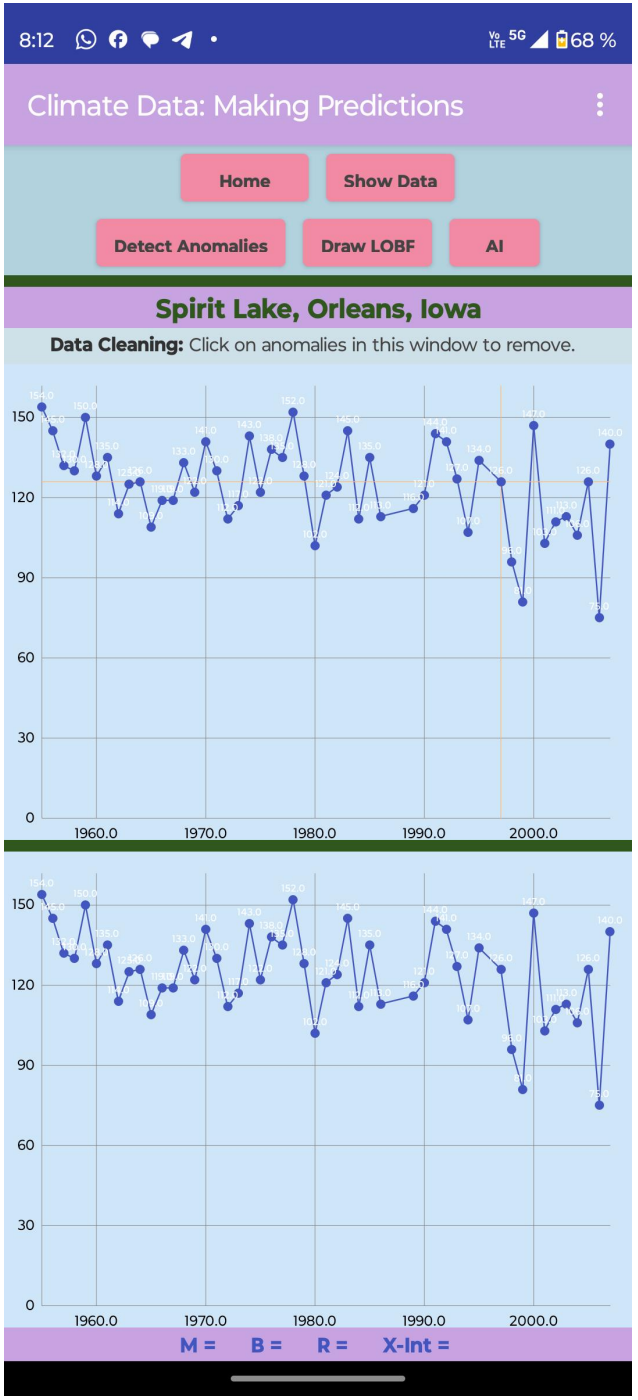
Home | Show Data | Detect Anomalies | Draw LOBF | AI

Data Cleaning: Click on anomalies in this window to remove.

M = B = R = X-Int =


8:12
68 %
Climate Data: Making Predictions
Home
Show Data
Detect Anomalies
Draw LOBF
AI
Spirit Lake, Orleans, Iowa
Data Cleaning: Click on anomalies in this window to remove.
150
120
90
60
30
0
1960.0
1970.0
1980.0
1990.0
2000.0
M =
B =
R =
X-Int =


8:12
68 %
Climate Data: Making Predictions
Home
Show Data
Detect Anomalies
Draw LOBF
AI
Spirit Lake, Orleans, Iowa
Data Cleaning: Click on anomalies in this window to remove.
150
120
90
60
30
0
1960.0
1970.0
1980.0
1990.0
2000.0
M =
B =
R =
X-Int =


8:12
68 %
Climate Data: Making Predictions
Home
Show Data
Detect Anomalies
Draw LOBF
AI
Spirit Lake, Orleans, Iowa
Data Cleaning: Click on anomalies in this window to remove.
150
120
90
60
30
0
1960.0
1970.0
1980.0
1990.0
2000.0
M =
B =
R =
X-Int =

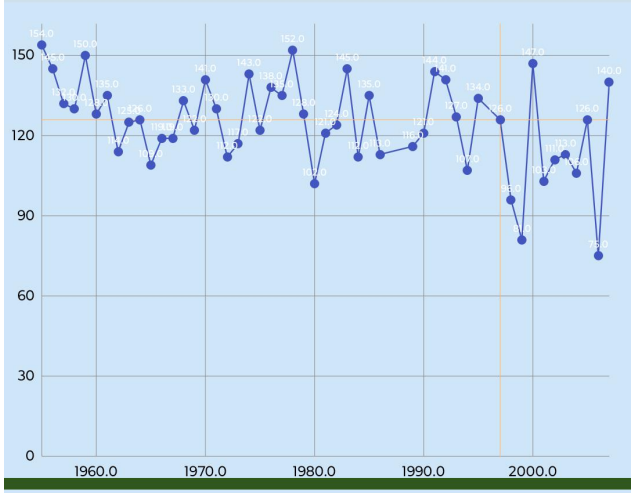
8:12 68 %

Climate Data: Making Predictions

Home | Show Data | Detect Anomalies | Draw LOBF | AI

Spirit Lake, Orleans, Iowa

Data Cleaning: Click on anomalies in this window to remove.



M = -0.42231 B = 961 R = -0.39127 X-Int = 2275

1:53 44 %

Climate Data: Making Predictions

Home | Show Data | Detect Anomalies | Draw LOBF | AI

Spirit Lake, Orleans, Iowa

It's impossible to accurately predict a year with no ice cover based solely on this data and correlation coefficient. Here's why:

* **Correlation vs. Causation:** A correlation doesn't imply causation. While the trend shows fewer frozen days over time, other factors besides climate change could be at play (e.g., lake depth, surrounding vegetation).
* **Limited Data:** 50+ years of data is not enough to confidently predict future trends, especially with complex systems like climate.

*Climate Change Implications:** The decreasing ice cover *suggests* a warming trend, consistent with global climate change. This has ecological consequences for the lake's ecosystem and could impact water quality, species habitat, and recreational activities. However, more extensive data and analysis are needed to draw definitive conclusions about the link to climate

M = B = R = X-Int =