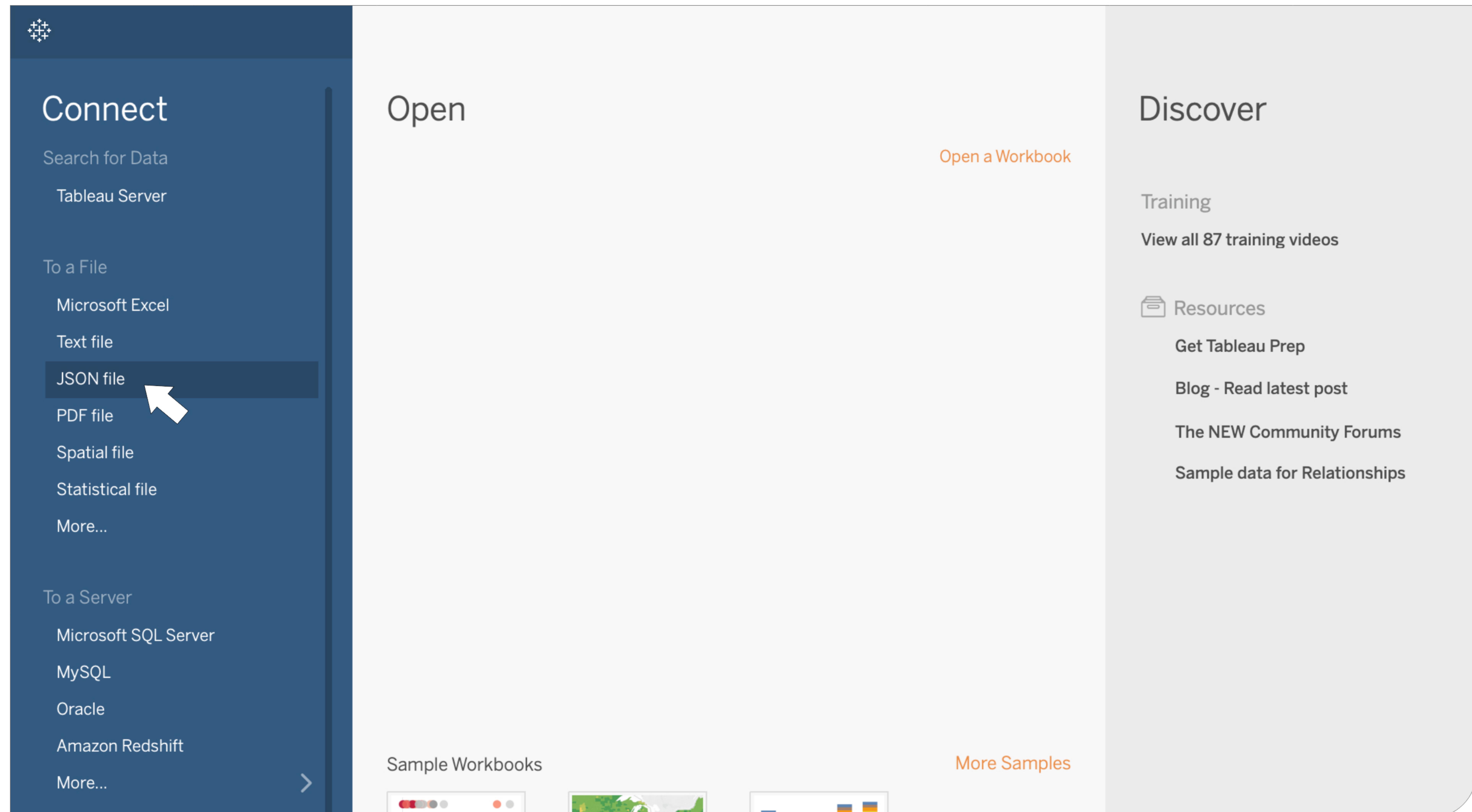


Task Guide: Data Analysis

Deloitte.

Import the data into Tableau

After installing Tableau and creating a trial account, your first step would be to import Daikibo's telemetry data. You do that by first selecting a JSON file connection on the home screen of Tableau and choosing the JSON file with Daikibo's telemetry data.



Import the data into Tableau

Then you need to check all Schema Levels as in the screenshot bellow. Press OK.

The screenshot shows the 'Select Schema Levels' dialog box in Tableau. On the left, the 'Connections' pane shows a connection named 'daikibo-telemetry-data' (JSON file). The 'Files' pane shows a file named 'daikibo-telemetry-data.json'. The main dialog box displays the inferred schema for this file. The schema is organized into three main categories: 'Schema', 'data', and 'location'. Under 'Schema', there are three fields: 'deviceID' (example value: 19ff3161-2b3a-40a3-8604-bdc6532d0dab), 'deviceType' (example value: CNC), and 'timestamp' (example value: 1.61982e+12). Under 'data', there are two fields: 'status' (example value: healthy) and 'temperature' (example value: 27). Under 'location', there are five fields: 'area' (example value: keiyō-industrial-zone), 'city' (example value: tokyo), 'country' (example value: japan), 'factory' (example value: daikibo-factory-meijo), and 'section' (example value: section-1). All schema levels are checked (indicated by a checked checkbox icon). A note at the top states: 'The schema levels you select determine which dimensions and measures are available for analysis in the worksheet.' Below this is a note: 'Schema is inferred from scanning a sample of the document.' There are also 'Scan Entire Document' and 'Collapse Fields' buttons. At the bottom right of the dialog box, there is a 'Show hidden fields' checkbox and a 'rows' button with an arrow icon.

| Schema | Example Value |
|-------------|--------------------------------------|
| deviceID | 19ff3161-2b3a-40a3-8604-bdc6532d0dab |
| deviceType | CNC |
| timestamp | 1.61982e+12 |
| status | healthy |
| temperature | 27 |
| area | keiyō-industrial-zone |
| city | tokyo |
| country | japan |
| factory | daikibo-factory-meijo |
| section | section-1 |

Import the data into Tableau

Press the Automatically Update button. The first 1000 rows will be loaded in the table.
Then open Sheet 1 (bottom left).

The screenshot shows the Tableau Data Source interface. On the left, the 'Connections' section lists 'daikibo-telemetry-data' (JSON file). The 'Files' section shows 'daikibo-telemetry-data.json'. Below these are 'New Union' and other connection options. The main area displays the data from 'daikibo-telemetry-data.json' with columns: Document Index (#), Status, Temperature, Device ID, Device Type, Area, City, and Country. At the bottom, there are buttons for 'Update Now' and 'Automatically Update'. A callout points to the 'Automatically Update' button. The bottom navigation bar includes 'Data Source' (selected), 'Sheet 1' (highlighted in orange), and other worksheet icons.

Connections

daikibo-telemetry-data
JSON file

Files

daikibo-telemetry-data.json

New Union

daikibo-telemetry-data.json

Sort fields Data source order ▾

Show aliases Show hidden fields → rows

| # | daikibo-telemetry-data.json Document Index (...) | Abc Status | # daikibo-telemetry-dat... Temperature | Abc Device ID | Abc daikibo-telemetry-data.json Device Type | Abc daikibo-telemet... Area | daikibo-teleme... City | dai... Co... |
|---|---|---------------|--|------------------|---|-----------------------------------|---------------------------|-----------------|
| 1 | daikibo-telemetry-data.json | Normal | 23.5 | 1234567890 | Smart Thermostat | Area A | City X | Country Y |

Update Now

Automatically Update

Go to Worksheet

Data Source Sheet 1 + +

Create a Calculated Field

Under the last item of the Measure Names list - right click -> Create Calculated Field...

The screenshot shows the Tableau Data Analysis interface. On the left, the data source 'daikibo-telemetry-data' is selected, displaying a folder structure with 'Daikibo-Telemetry-Data', 'Data', and 'Location' folders. Under 'Location', fields like 'Area', 'City', 'Country', 'Factory', and 'Section' are listed. Below these are 'Measure Name', 'Temperature', 'Timestamp', and several unnamed fields starting with '#'. A context menu is open over the last item in the 'Measure Name' list, with 'Create Calculated Field...' highlighted in blue and a white arrow pointing to it.

The main workspace is titled 'Sheet 1' and contains three blank 'Drop field here' areas. To the right is a large library of visualization icons categorized by type: Rows, Filters, Marks, and various chart types like Maps, Gantt Charts, and Line Charts. At the bottom right, a note says 'Select or drag data' with the instruction 'Use the Shift or Cmd key to select multiple fields'.

Create a Calculated Field

Name the field Unhealthy and fill in the formula bellow. Press OK to save it.

This calculated measure will help us learn how long was the down time of different pieces of the manufacturing process. Since messages are sent every 10 minutes, we set this measure to 10 for every unhealthy status received.

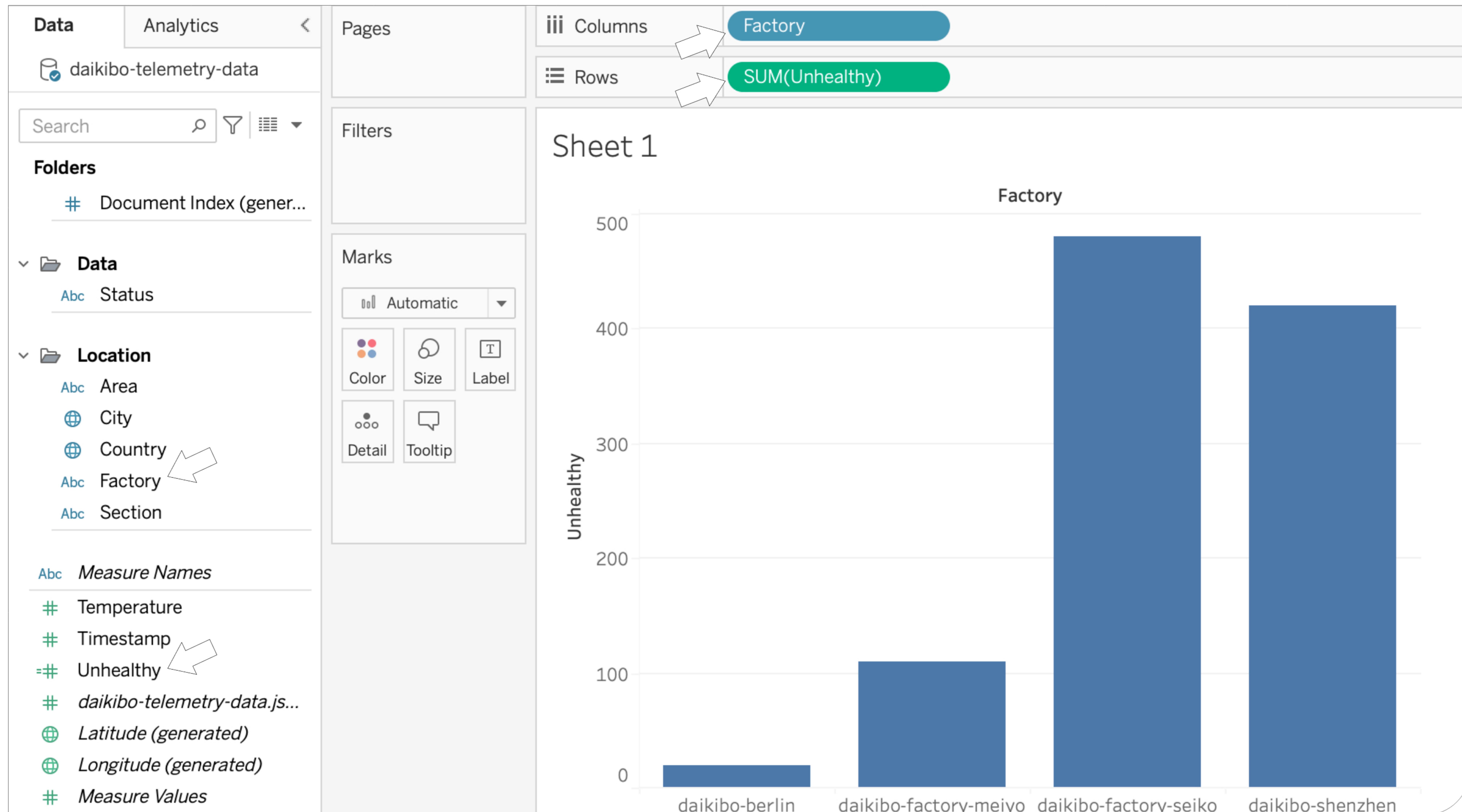
The screenshot shows the Tableau Data Analysis interface. On the left, the Data pane lists various data sources and folders. In the center, a dialog box is open for creating a calculated field named "Unhealthy". The formula entered is:

```
IF[Status] = "unhealthy" THEN 10 ELSE 0 END
```

The dialog also displays the message "The calculation is valid." with "Apply" and "OK" buttons. To the right of the dialog, there is a sidebar with various visualization options and a section titled "For maps try" with buttons for "Dimension", "Dimensions", and "Measure". A note at the bottom right says "May use spatial measure in place of geo dimension".

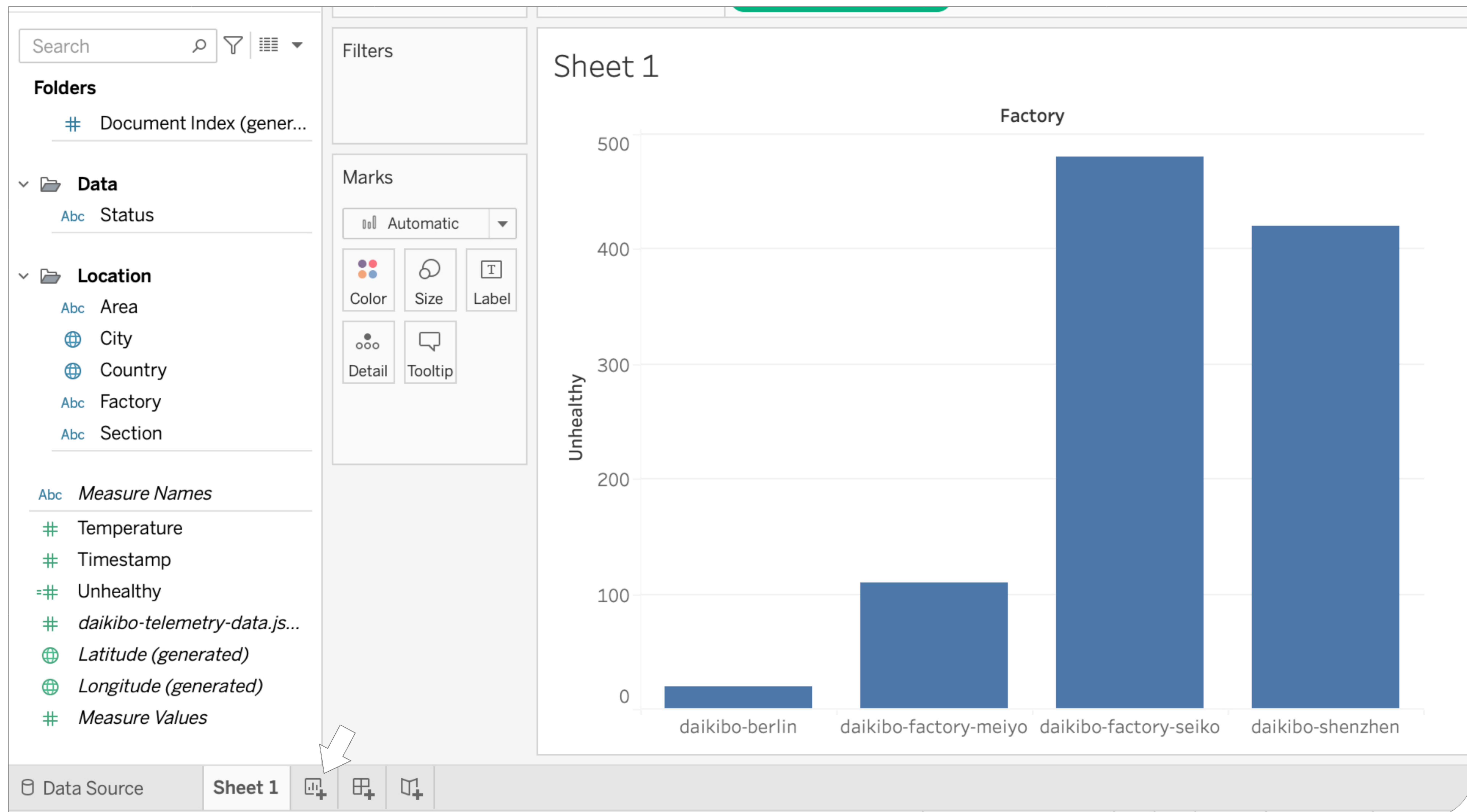
Create a Chart: Downtime Per Factory

The first chart we are going to create is Downtime Per Factory. We will use a classic bar-chart for that. First drag the Factory field under location to the Columns field (top middle). Then drag the Unhealthy field to the Rows field. If the factory names are not fully visible - just resize the chart by hovering at right edge and when the resize cursor shows up, drag it further right.



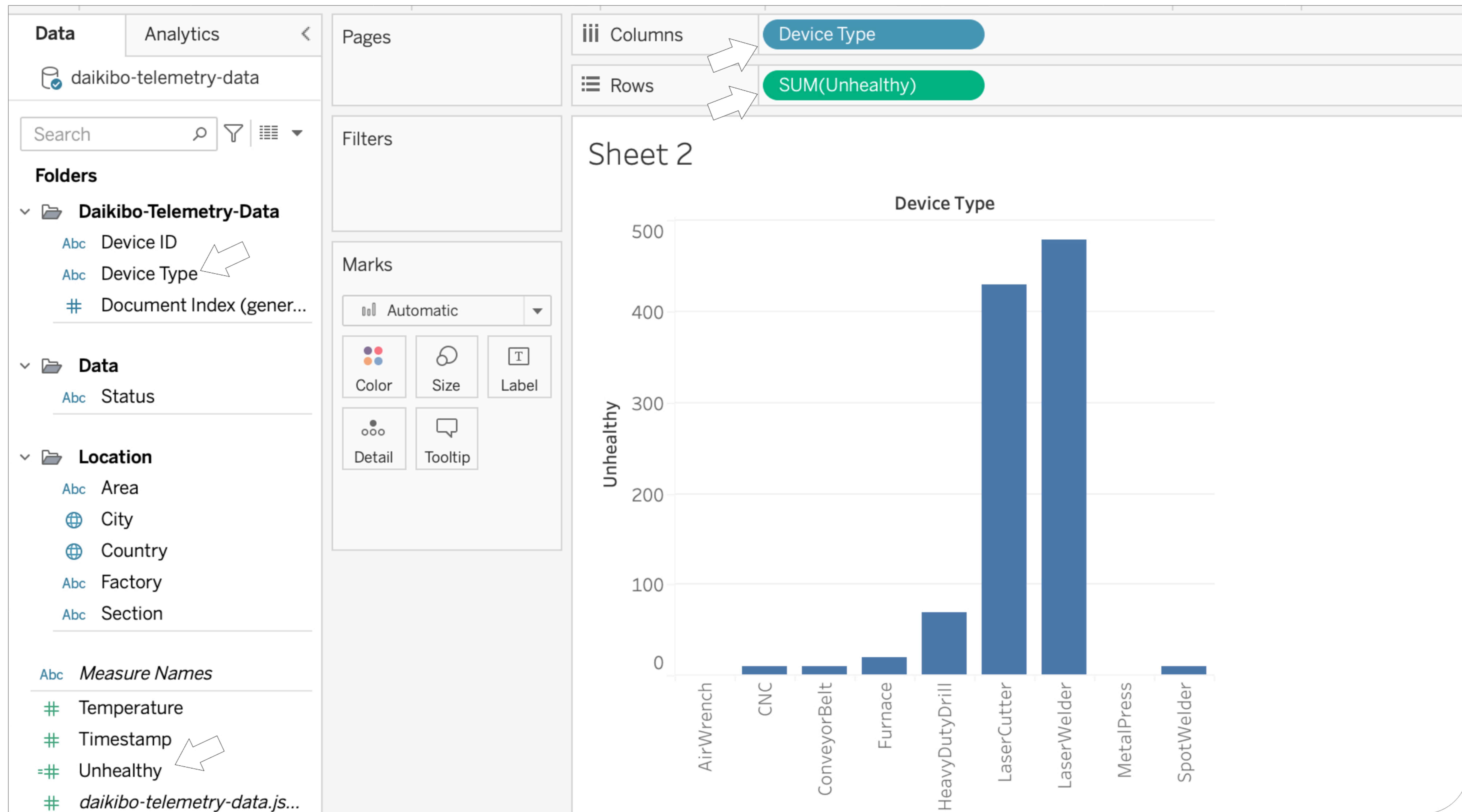
Create a Chart: Downtime Per Machine

Create a new sheet by pressing on the New Sheet button next to Sheet 1's tab (bottom left).



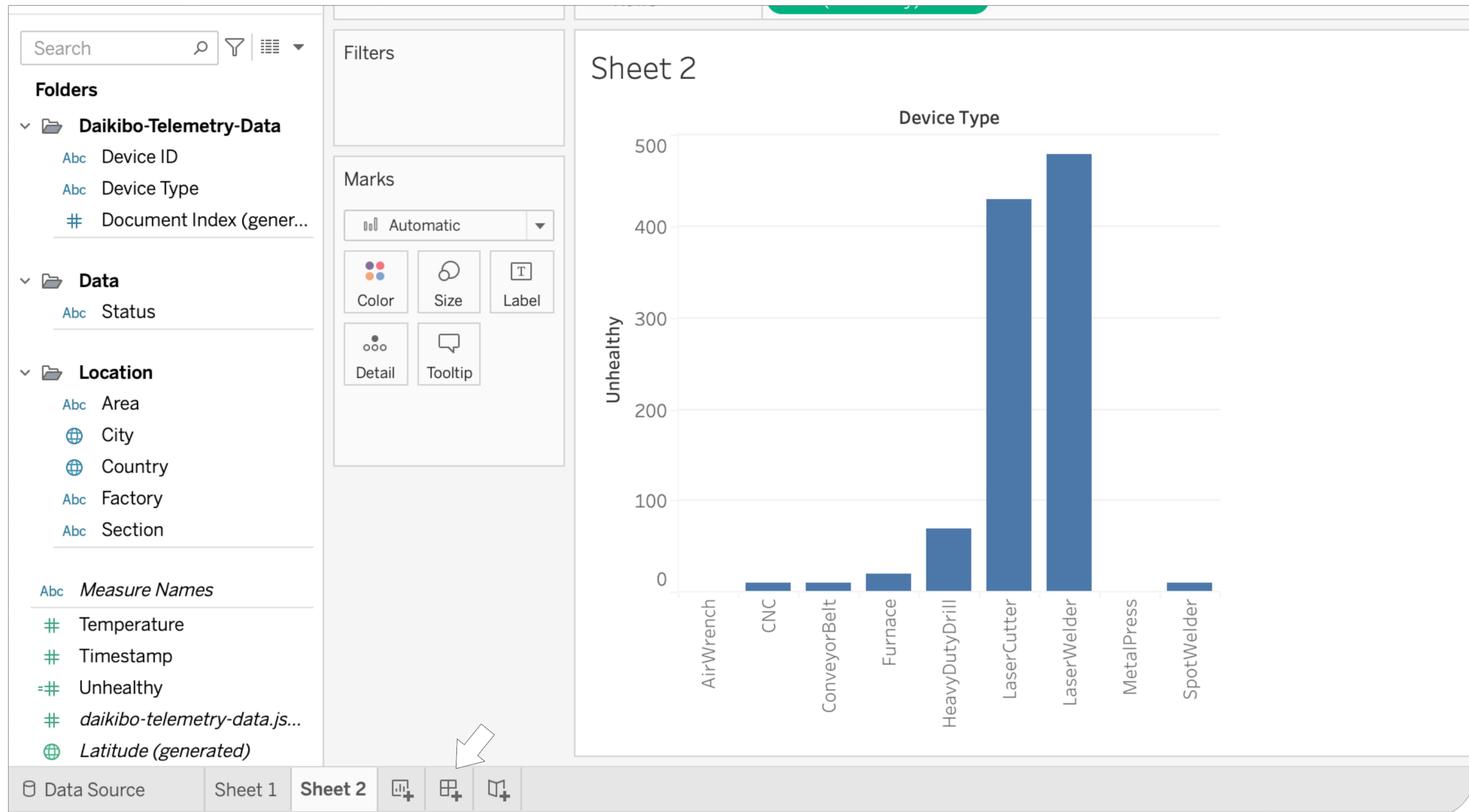
Create a Chart: Downtime Per Machine

In the new Worksheet, drag the Unhealthy field in the Rows field AND drag the Device Type field in the columns field.



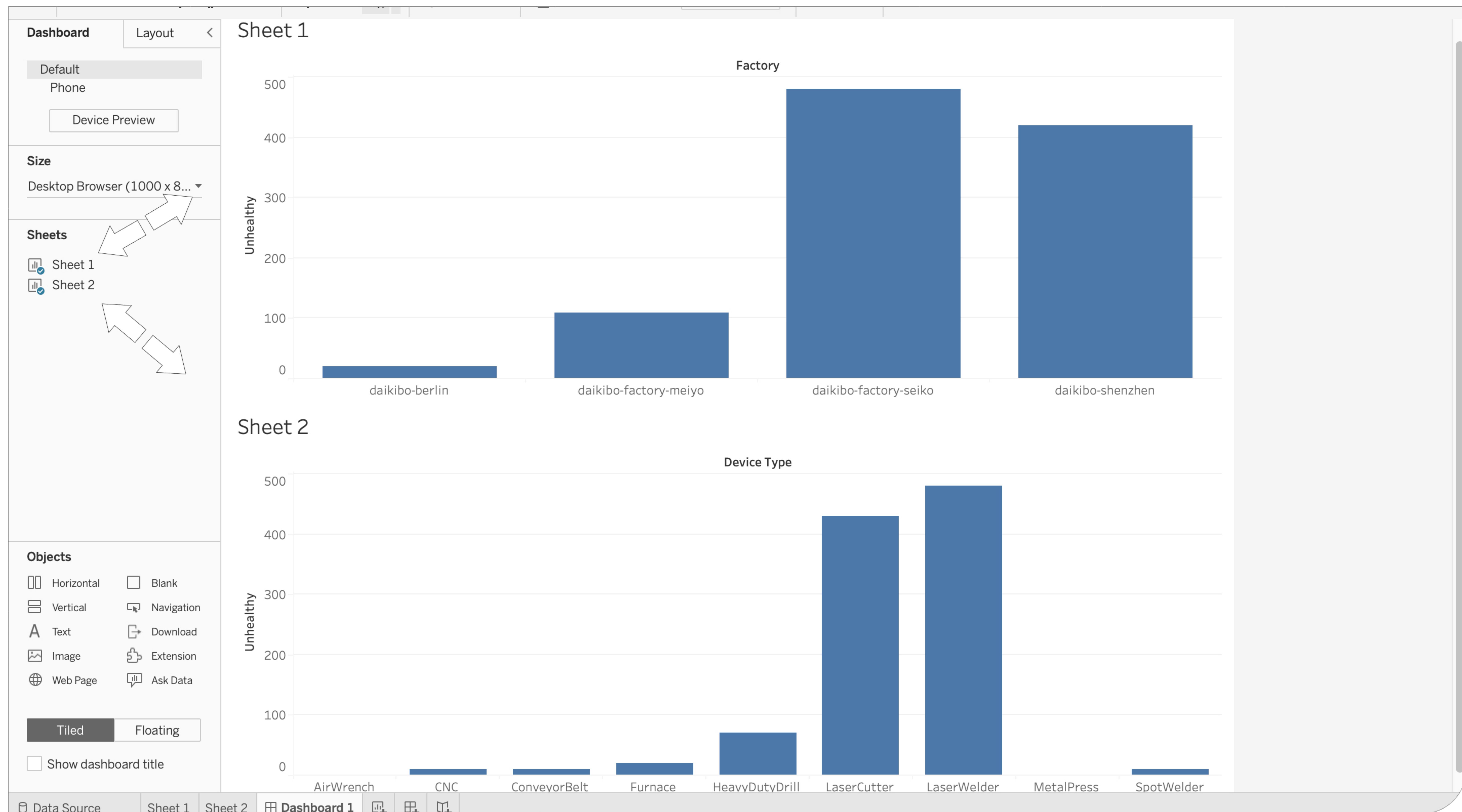
Create a Dashboard

It's time to combine those 2 charts to better piece together and understand the downtime at the different locations. For that purpose we will create a dashboard. Click on the button New Dashboard (on the right of the New Worksheet button we just used).



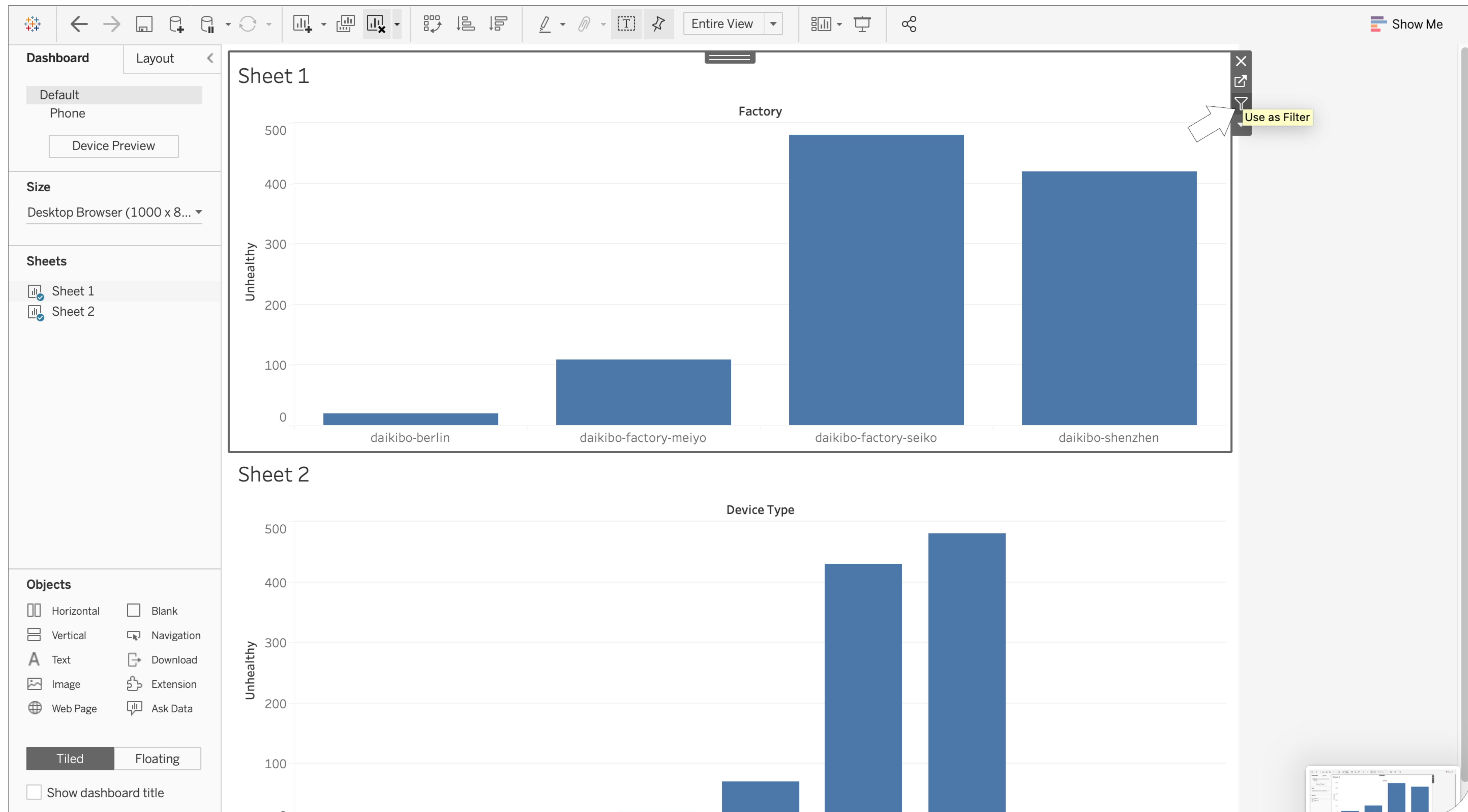
Create a Dashboard

Drag Sheet 1 on top and Sheet 2 on the bottom of the dashboard's canvas.



Create a Dashboard

And finally we want to sync the 2 charts and whenever we select a factory in the first (top) chart - the bottom chart to show only the down time of all machines there. To do that select the first chart by clicking once on it -> click the filter/funnel icon at the top right corner.



Create a Dashboard

Now when we select a factory, we can see what the downtime of the machines there, specifically, was. Here is what you should see if you select the Shenzhen factory.

