Use Case: Displaying Metrics

Author: Matthew Aleck
Date: 10/28/2019

User Story Description

As a user, I want to display certain metrics for each loaded track.

Identification of Actor(s)

The User and the GPS App

Pre-conditions

Use Case 1

Scenarios

Basic/Normal Flow

User	GPS App
1. User pushes Metric	
	2. Pops up a dialog allowing the use to select the desired track to display
3. User selects which track to display metrics for	
	4. Calculates the metrics for the desired track and displays the metrics

Alternate Flow 1: User clicks cancel in the pop-up dialog

User	GPS
1. User pushes Metric	
	2. Pops up a dialog allowing the user to select the desired track to display
3. User selects cancel/exit	
	4. Returns to the main screen

Alternate Flow 2: Track contained less than 2 points

User	GPS
1. User pushes Metric	
	2. Pops up a spinner dialog
3. User selects which track to display the metrics for	
	4. Calculates the metrics for the desired track and displays the metrics except the distance and speed values. Instead displaying “Distance and Speed cannot be computed” for distance and speed

Post-conditions

Initially displays the metrics from the “first” track in the collection but can display any of the selected tracks from the collection

Additional Requirements

Make sure that Use Case 1 has succeeded

Textual Analysis

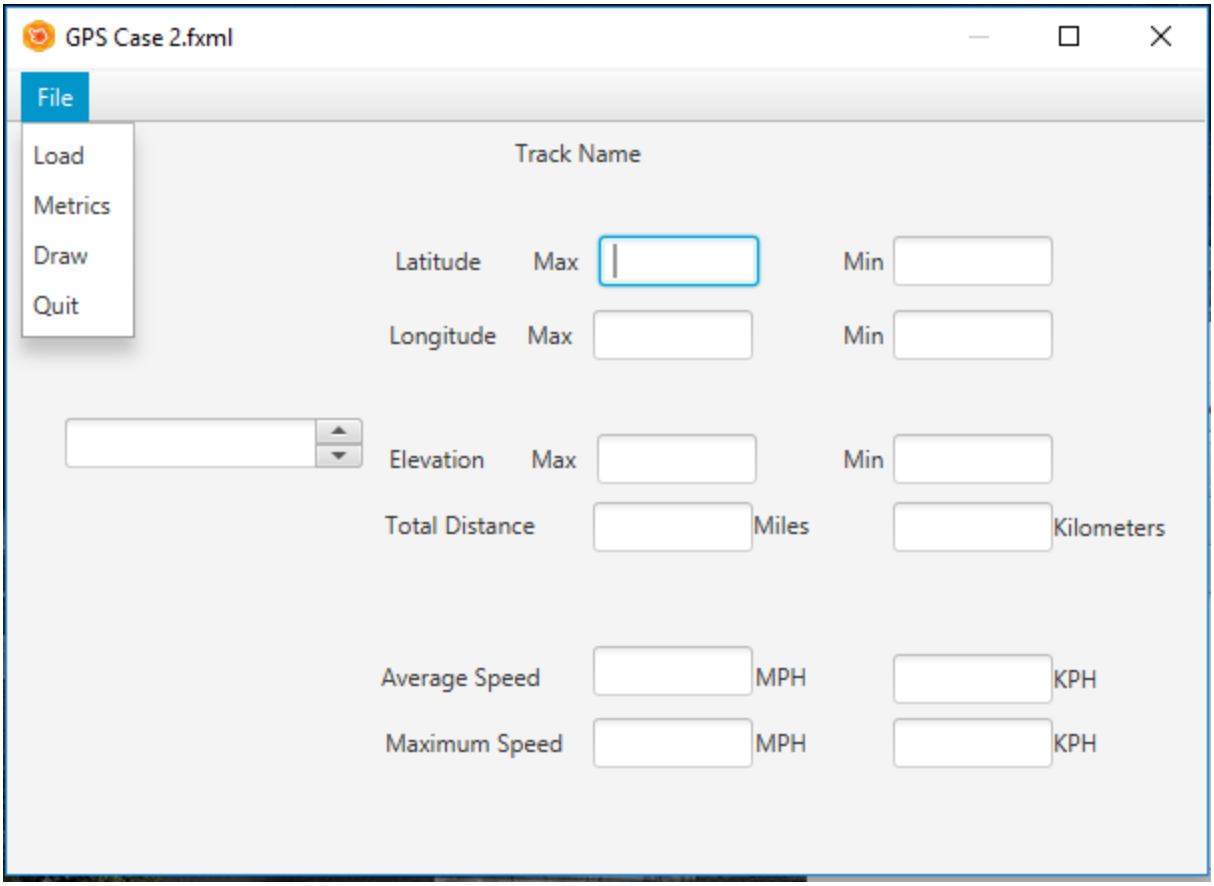
Noun Verb

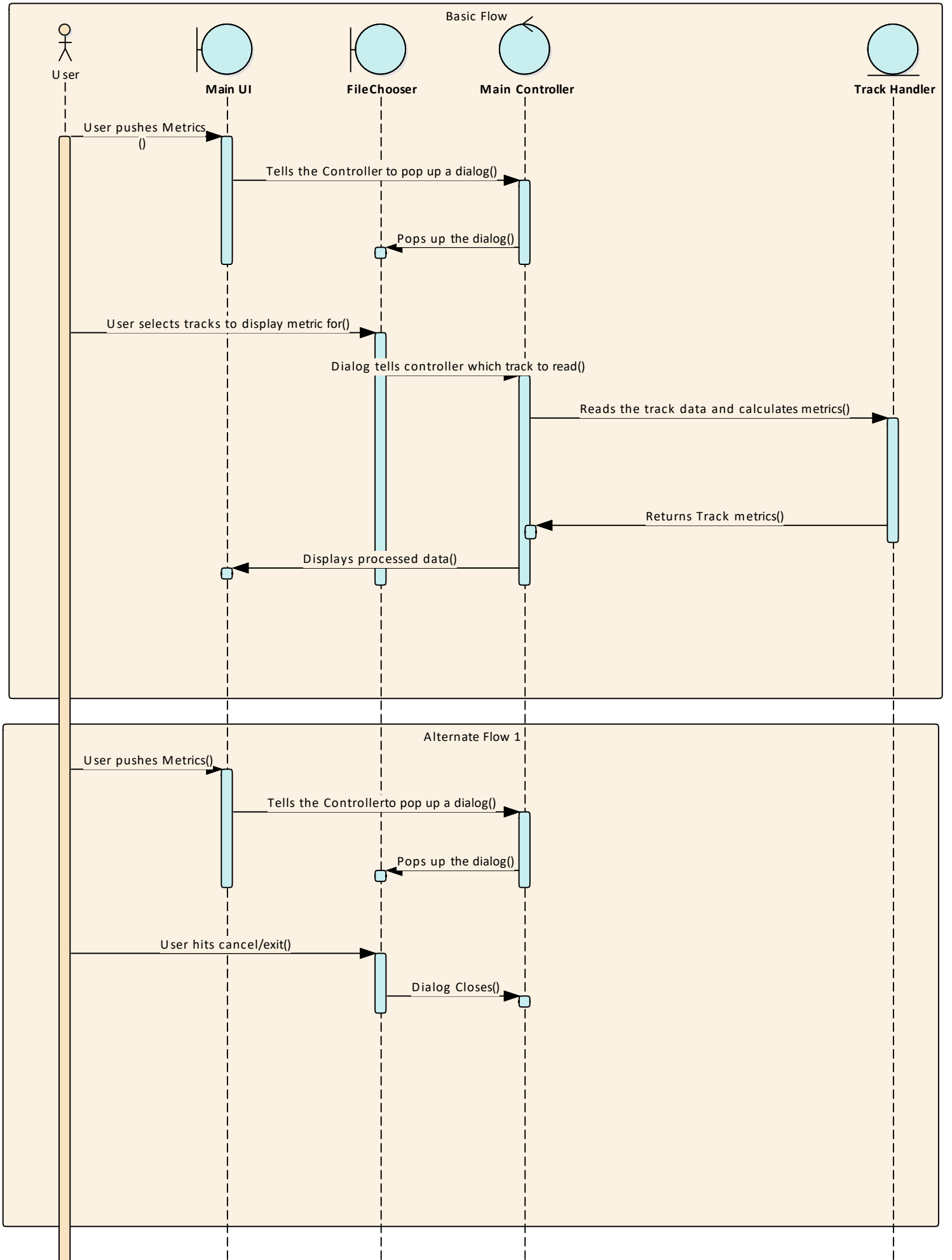
2. As a user, I want to display certain metrics for each loaded track.

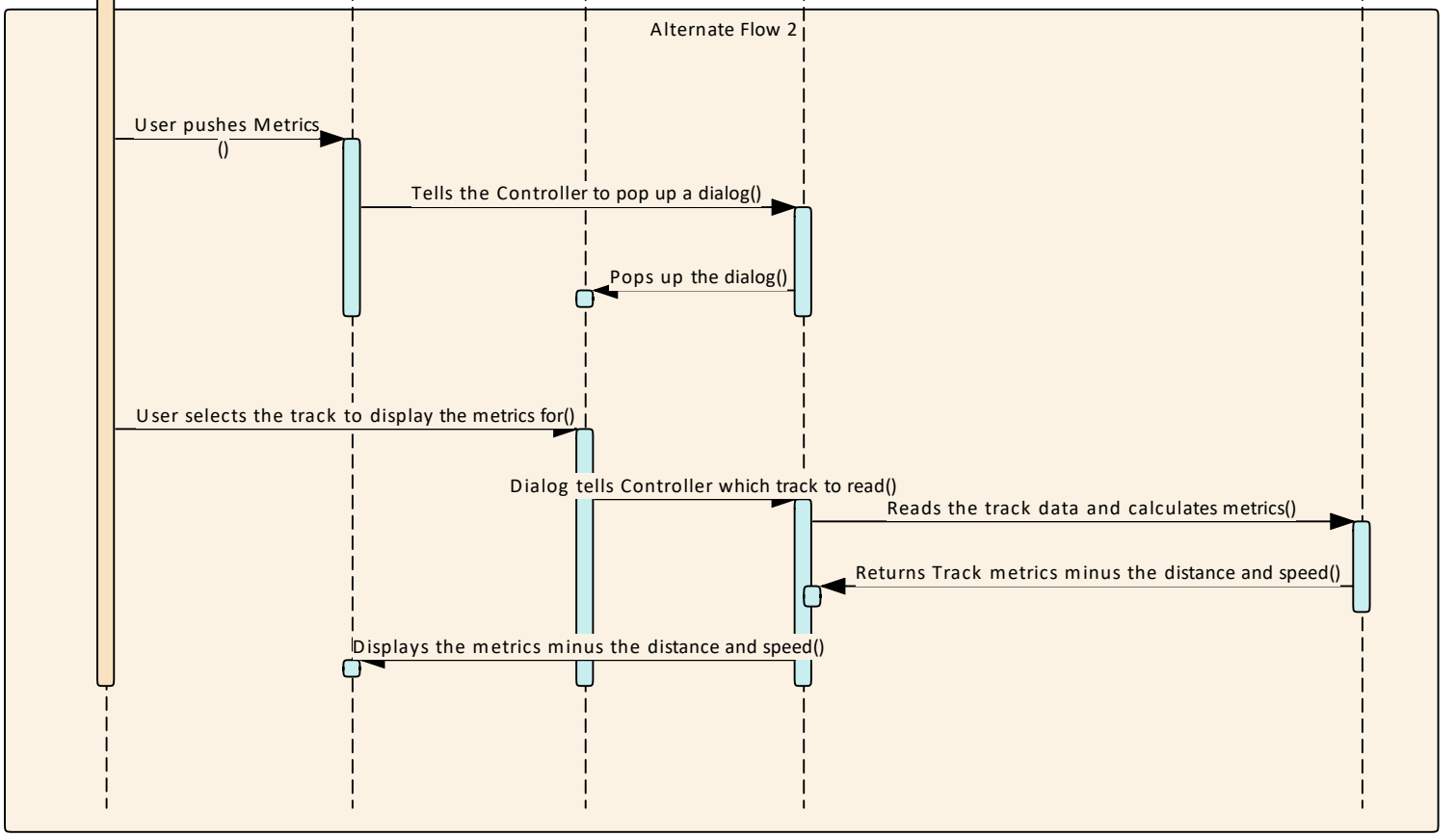
Acceptance criteria:

- If multiple tracks are loaded, the user shall be able to select which track whose metrics are to be displayed.
- The metrics shall be displayed in the main screen.
- The metrics shall include:
  1. the name of the track, obtained from the <name> element of the GPX file
  2. the minimum and maximum latitude in units of degrees, to 2 decimal places of precision.
  3. the minimum and maximum longitude in units of degrees, to 2 decimal places of precision.
  4. the minimum and maximum elevation in units of both meters and feet, to 2 decimal places of precision.
  5. the total distance traveled in a track. The total track distance (in units of both kilometers and miles) is to be displayed to 2 decimal places of precision, computed by summing distances between individual GPS points, and accounting for elevation changes. Note: It is not necessary to account for the curvature of the earth - since distances between successive coordinates acquired by a GPS device are relatively small, you can assume a straight line between any two coordinates, rather than an arc. See this page that contains the relevant formulas.
  6. the average speed (in both kilometers/hour and miles/hour) over the entire track, to 2 decimal places of precision.
  7. the maximum speed (in both kilometers/hour and miles/hour) that occurred during the entire track, to 2 decimal places of precision.
- If a track contains less than two points, a message indicating that distance and speed cannot be computed shall be displayed instead of actual distance and speed values.

Objects/Variables	**Methods**
Min and Max Latitude	getMin/MaxLat
Min and Max Longitude	getMin/MaxLong
Min and Max Elevation	getMin/MaxEvelation
Total Distance in miles and kilometers	calcTotalDistanceMiles/Kilo
Average Speed in MPH and KPH	calcAvgSpeedMPH/KPH
Max Speed in MPH and KPH	calcMaxSpeedMPH/KPH


GPS Case 2.fxml
File
Load
Metrics
Draw
Quit
Track Name
Latitude
Max
Min
Longitude
Max
Min
Elevation
Max
Min
Total Distance
Miles
Kilometers
Average Speed
MPH
KPH
Maximum Speed
MPH
KPH


Basic Flow
User
Main UI
FileChooser
Main Controller
Track Handler
User pushes Metrics ()
Tells the Controller to pop up a dialog()
Pops up the dialog()
User selects tracks to display metric for()
Dialog tells controller which track to read()
Reads the track data and calculates metrics()
Returns Track metrics()
Displays processed data()
Alternate Flow 1
User pushes Metrics()
Tells the Controllerto pop up a dialog()
Pops up the dialog()
User hits cancel/exit()
Dialog Closes()


Alternate Flow 2
User pushes Metrics ()
Tells the Controller to pop up a dialog()
Pops up the dialog()
User selects the track to display the metrics for()
Dialog tells Controller which track to read()
Reads the track data and calculates metrics()
Returns Track metrics minus the distance and speed()
Displays the metrics minus the distance and speed()