Assignment 1

Team Number: 22
Team Members

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Introduction

Author(s): Abhisaar Bhatnagar

BEAM™ is a desktop-based personalized, sporting application which allows its users to analyze their physical activity (ranging over many sports) all by simply uploading GPX format files at the click of a button. This application is inspired by the likes of Strava, MapMyRide, and GPXSee. The user chooses a sport, uploads a GPX file, and is met with unique metrics and graphs for each corresponding type of activity.

This application is designed with a user interface targeted for easy maneuverability and access by all of its users, mainly comprising of:

- **Active User:** A user who makes use of the app's basic functionality to track its basic metrics for the default sporting activities (i.e. running, walking).

- **Athlete:** A user who makes use of the app for advanced functionality to track basic and additional metrics of any sporting activity and set timely goals.

- **Coach/Trainer:** A user who makes use of the app for analysis of specific users to track all their metrics, activity history, and graphs.

The main features **all users** can interact with comprise of:
- ***Basic Functionality***: Extract data from GPX files and output metrics visually and numerically
- ***Additional Functionality***: Account system, timely goal creation, activity history, fun facts per data analyzation, calorie descriptor.

The **main modules** of the application consist of:
- *GUI*: app window which allows input/output interactions
- *Sports Data*: extracts the activity data and analyzes the metrics according to the assigned sport.
- *Data Representation*: translates and formats sports data to graphic/visual representations
- *User Accounts*: retrieves and stores user data (height, weight, age… etc) and allows access to activity history

The final application will be presented as an interactive fitness application based on the aforementioned main modules where the user interacts with the application and its respective functionalities. The way the application will operate is as illustrated:

- On the first ever app launch the user is prompted to input their personal data to be used in later metric calculations.
- The user interface will allow the user to navigate to the respective areas of the app they require i.e. GPX input, activity history, goal creation.
- The application will display the corresponding accessed screen.
- The user can input a GPX file of their activity for which the application will parse, display and store all its data.
- Each GPX File input is taken as a separate activity which will then be saved and can be accessed for future references.

Features

Author(s): Martynas Rimkevičius, Baher Wahbi, Erik Vunš, Abhisaar Bhatnagar.

ID	Short name	Description	Champion
F1	GUI	Graphical User Interface to interact with all the features below.	Baher
F2	Base Metrics	Analyze GPX file for base metrics: ● Total Distance ● Total Time ● Average Speed ● Calories Burnt	Martynas

F3	Additional Metrics	Analyzes GPX files for additional metrics expanded from base metrics depending on the sport selected.
		Such as:
		● Cycling
		  ○ Speed
		  ○ Power
			Martynas

		● Swimming
		  ○ Pace per 100m
		  ○ Stroke Length
		● Running
		  ○ Pace
		  ○ Elevation
		  ○ Cadence	

F4	Map GPS Coordinates	Display coordinates that are in the GPX file on a Google Maps environment.	Abhi
F5	Graphs	Display sports metrics change over time on a graph so that a user could see their performance during the activity.	Martynas
F6b	User Goals	Custom user goals which are updated with each GPX entry. For example, a user sets a 100km running goal for their week.	Erik
F7b	Activity History	A saved history of all activities which can be accessed and reviewed by the user. For example, visualizing past activity data.	Baher
F8b	Account System	Users are prompted to input their information: ● Weight ● Height ● Gender ● Name ● Age	Baher
F9b	Fun Facts	A fun fact displayed to the user per GPX file input. For example, "You ran 47% of a marathon today".	Abhi
F10b	Calories Burnt "Per Meal"	Users can choose to visualize their calories burnt as a specific food. For example, "On today's run you have burnt 14 bananas".	Erik

Quality requirements

Author(s): Martynas Rimkevičius, Baher Wahbi, Erik Vunš.

ID	Short name	Quality attribute	Description
QR1	Consistent Navigation	Usability	By moving through different screens the user will end up at the screen that is expected. For example, when going back, the screen will change to the prior one.
QR2	Extendable Sport List	Maintainability	It is easy to add new sports (with their respective metrics) to the architecture.
QR3	Comprehensible Data Representation	Usability	Data (text, map and graphs) is structured and outputted in a clean and understandable manner.
QR4	User Data Requirement	Availability	Unable to input or access GPX files without creating an account and filling user data.
QR5	User Data Validation	Reliability	User data is in a reasonable range, such as age: 16-110, weight: 30-200kg and height: 100-230cm.
QR6	User Data Safekeeping	Security	User data is encrypted with base64 encoding on input.
QR7	Compatible Metrics	Availability	Each sport will only compute their own respective metrics.

Java libraries

Author(s): Martynas Rimkevičius

JavaFX - used to create a GUI for the application.

GMapsFX - used to display Google Maps in the application without directly interacting with the Google Maps API.

Graphhopper - used to easily display GPX coordinates on a map.

SonarLint - used to ensure that all code adheres to the same style and practice.

Gpx-parser - used to extract data to a Java object and access metrics easily.

GSON - used to work with JSON files so that they could easily be converted to an object.

Dex - used to draw graphs visualizing activity data.

Time Logs

Team number	22		
Member	**Activity**	**Week number**	**Hours**
Martynas	Brainstorming features and libraries	1	2
Erik	Brainstorming features	1	0.75
Baher	Brainstorming features	1	1.5
Abhisaar	Brainstorming features	1	1.5
Martynas	Define requirements	2	2.5
Baher	Define requirements	2	2.5
Erik	Define requirements	2	2.5
Abhisaar	Define requirements	2	0.5
Abhisaar	Wrote Introduction	2	2
Martynas	Refining doc	2	1.5
Baher	Refining doc	2	1.5
Erik	Refining doc	2	1.5
Abhisaar	Refining doc	2	1.5
		TOTAL	21.75