HeartFit

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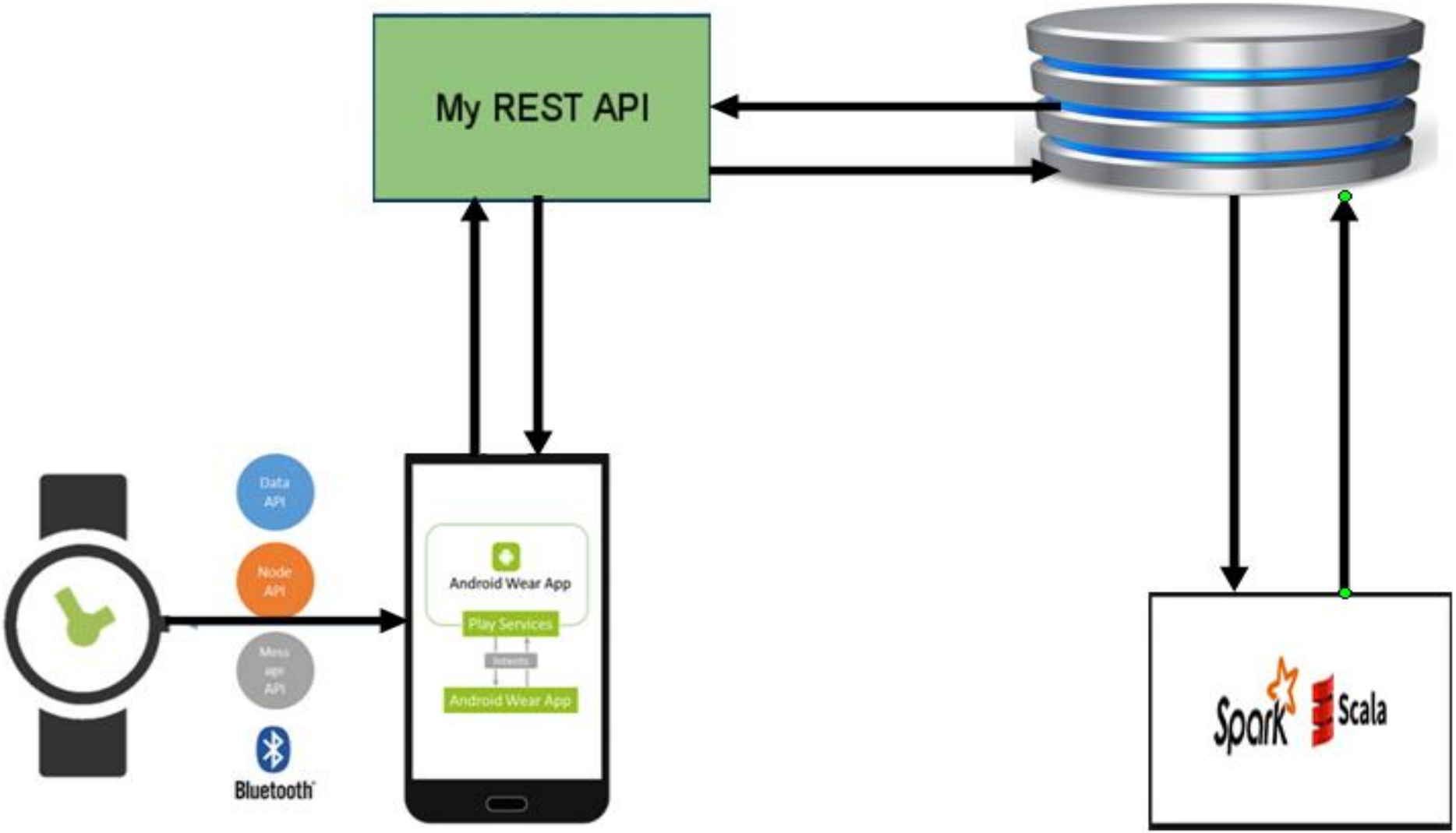
Features

- Monitoring Heart rate per hour to indicate any abnormal behavior
- Sleeping pattern Mining, to monitor how well user is sleeping by collecting accelerometer events
- Recommending matching food item having similar nutrient

Architecture



Data Collection

- Two types: Real time and Static
- Real Time Sensorial data : Heart rate and accelerometer sensors
- National Nutrient Database for Standard Reference : for matching nutrient food recommendation.
- Its Static database for now. Need to update when their library gets updated.

ML Algorithms

- Spark MLlib Apriori for frequent pattern : FP growth inbuild algoritham in Spark Mllib.

- For finding the frequent heart pattern for previous hour heart rate data and representing them as a chart.

- The purpose is to provide number of occurrence of particular heart bit in an hour cycle.

ML Algorithms

Cosine Similarity : Content/feature based collaborative filtering for recommending food items having similar nutrition.

$$cos(\vec{t_1}, \vec{t_2}) = \frac{\vec{t_1} \cdot \vec{t_2}}{\|\vec{t_1}\| \|\vec{t_2}\|}$$

	glutathione	homocystine	coa	transhydrogenase
$\vec{t_1}$	1	1	0	1
$\vec{t_2}$	2	0	1	1

$$\frac{1 \cdot 2 + 1 \cdot 0 + 0 \cdot 1 + 1 \cdot 1}{\sqrt{1^2 + 1^2 + 0^2 + 1^2}\sqrt{2^2 + 0^2 + 1^2 + 1^2}} \simeq 0.72$$

References

- http://www.ars.usda.gov/Services/docs.htm?docid=8964
- ftp://ftp.tik.ee.ethz.ch/pub/students/2010-HS/SA-2010-26.pdf
- http://www.ceng.metu.edu.tr/~e1395557/foodRecSys.pdf
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