Project Proposal:

Are You Fitter Than a Norwegian?

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This site allows cardio enthusiasts to compare how fast they are relative to Norwegians and visualize how fast Norwegians are in general.

For this project, we will use data collected by the European Journal of Applied Physiology in coordination with the Norwegian Armed Forces HR and Conscription Centre.[1] Each year, roughly 33% of Norwegians aged 17-21 must undergo a physical examination during yearly selection for compulsory military service. This data is under the Creative Commons Attribution 4.0 International license, which allows its use in this project[2]. 154,659 Norwegians are included in this dataset that was collected between 2011 to 2019. 66% of subjects are men and 34% are women. However, the study did not release publicly available data for each individual due to privacy concerns. Rather, measurements such as height, weight, BMI, treadmill runtime, performance across several strength exercises, and estimated VO2 Max Scores were released across the fifth to ninety fifth percentiles (Aandstad). Our team will fit regression models such as normal distributions to these measures in order to generate theoretical values across percentiles of Norwegians. This generated data will be stored in a .csv file from which the site will perform queries.

This site must account for a variety of user roles: students, runners or research scientists studying athletic performance might be interested in this data because it provides insights about variance across the population of the level of fitness of individuals. Likewise, Norwegians might want to compare their cardiovascular endurance against their peers to see how fit they are. For instance, Bjørn is a Norwegian man who is interested in determining his relative strengths and weaknesses, so he decides to visit this site and input data from his most recent run. The site will use the Jack Daniels equation to output his estimated VO2 max score along with his percentile

[1] *Reference data on anthropometrics, aerobic fitness and muscle strength in young Norwegian men and women* by Anders Aandstad.
[2] http://creativecommons.org/licenses/by/4.0/

rank among his fellow Norwegians (Derma). Runners across a wide range of abilities with varying goals will likely use the site: for instance, beginning runners who want to gauge their current performance will use the site, so they have a benchmark to compare to as they progress. Competitive runners in high school might utilize the site to visualize how fast they would have to run to achieve a certain percentile ranking among others. Competitive college athletes might even track their performance over time using these metrics. Moreover, people who are just interested in statistics might use the site to compare their athletic performance to those of Norwegians or find out how fast Norwegians can run for the purposes of entertainment. Also, anyone who is interested in knowing what their VO2 max score is or how fast they can run based off of certain conditions that they meet.

References

Aandstad, A. Reference data on anthropometrics, aerobic fitness and muscle strength in young Norwegian men and women. *Eur J Appl Physiol* 121, 3189–3200 (2021). https://doi.org/10.1007/s00421-021-04784-4.

Derma, Filip. VO2 Max Runners Calculator. *Omni Calculator* (2020). https://www.omnicalculator.com/sports/vo2-max-runners.