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# Introduction

* 1. Summary and Purpose
     1. The intent of this application is for end users to easily log and track their running and walking activities. End users should be able to monitor their activities by viewing and personalizing visualizations, generate customs reports for all fields available, and log all their activities with several available fields so that they can make their activities as detailed as they would like. This means end users will create their own personal accounts using email and password.
  2. Target Audience
     1. Runners and walkers of all ages and skill levels who wish to track their performance and progress. Users can be as detailed and thorough as they would like.
  3. Non-functional Requirements
     1. Performance
        1. Response Time: specify the maximum acceptable response time for different actions or operations, such as user login or data retrieval
        2. Throughput: specify the maximum number of requests per second the application should be able to handle
        3. Resource Usage: specify the maximum amount of CPU, memory, or disk space the application should be able to use
     2. Security
        1. Authentication: specify the authentication mechanisms to be used, such as password-based authentication, multi-factor authentication, or OAuth
        2. Authorization: specify the access control mechanisms to be used, such as role-based access control or attribute-based access control
        3. Data Protection: specify the measures to be taken to protect sensitive data, such as encryption, hashing, or tokenization
        4. Compliance: specify the regulatory and compliance requirements that the application needs to meet, such as GDPR, HIPAA, or PCI DSS
     3. Scalability
        1. Vertical Scalability: specify the maximum number of users, events, or transactions the application should be able to handle on a single server
        2. Horizontal Scalability: specify the ability of the application to scale horizontally, i.e., by adding more servers or nodes to the system
        3. Load Balancing: specify the load balancing mechanisms to be used, such as round-robin or weighted distribution
     4. Availability
        1. Uptime: specify the minimum acceptable uptime for the application, such as 99.9% or 99.99%
        2. Fault Tolerance: Fault tolerance: specify the ability of the application to handle hardware or software failures, such as disk failure or network outage
        3. Disaster Recovery: specify the measures to be taken to recover from catastrophic events, such as data center outage or natural disasters

# User Requirements

* 1. Describe the features and functionality required for the application, such as user registration and authentication, logging runs and walks, viewing logged events, and generating reports.
     1. Required
        1. Email
        2. Password
        3. Username
        4. First Name
        5. Last Name
        6. Privacy Setting: do you want your profile to be viewable by others?
        7. Measurement Preference: Miles, Metric
        8. Week Start: Sunday, Monday
     2. Optional
        1. Gender: Male, Female, Other, Unspecified
        2. Date of Birth: MMMM / DD / YYYY
        3. Coach: Yes, No
        4. About Me: text box
        5. City
        6. State
  2. User Roles and Respective Permissions
     1. Admin: This will be site moderators who manage the frontend. Only a handful will ever be given this.
     2. Coach: No specific additional access early on. Likely to add to this role once site is established.
     3. User: This will be the basic end user role for all users on the site. All site visitors must create an account and log in to have.

# Technical Requirements

* 1. Frontend
     1. Framework will utilize the React.
  2. Backend
     1. Framework will utilize a scalable and high-performance option, which in this case will be Flask
     2. Our secure and reliable RESTful API will need to be determined
  3. Databases
     1. We will use a scalable and robust database system in PostgreSQL, which is an open source platform.
  4. Deployment and Hosting Platform
     1. We will look to deploy and host on a provider to be determined. Our options include AWS, Google Cloud, or Microsoft Azure.
     2. Implement continuous integration and deployment (CI/CD) pipelines to automate the build, test, and deployment processes.
     3. Implement auto-scaling and load balancing mechanisms to handle high traffic and spikes in demand.
  5. Data Analysis and Visualization
     1. We will be using powerful and flexible data analysis tools with Python and R.
     2. Implement data visualization tools and libraries, such as Matplotlib, Seaborn, and Plotly, to generate reports and visualizations.
     3. Implement data preprocessing and cleaning techniques to ensure data quality and consistency.
  6. Security and Performance
     1. Implement security measures, such as HTTPS, encryption, and authentication, to protect user data and prevent unauthorized access.
     2. Implement performance optimizations, such as caching, compression, and lazy loading, to improve the speed and efficiency of the application.
     3. Implement monitoring and logging tools to detect and troubleshoot issues and errors.
  7. Specify any third-party integrations required for the application, such as payment gateways, mapping APIs, social media APIs, etc.

# Data Requirements

* 1. Specify the data to be collected and stored by the application.
     1. User Profile
        1. See section 2 for details
     2. Logged Activities
        1. Required
           1. Datetime: MM/DD/YYYY HH:MM; then day of week will automatically be added
           2. Distance: #
           3. Unit: Meters, Miles, Kilometer
           4. Duration: HH:MM:SS
           5. Workout Type: Run, Walk
           6. Sub-Type: based on ‘Workout Type’
        2. Optional
           1. Comments
           2. Private Comments
           3. Equipment: Shoe, Outerwear
           4. Vitals: Max HR, Avg HR, Weight, Temperature, Respirations
           5. Weather: Condition, Temperature, Humidity, Wind, Comments
           6. Effort Rating: 1-10
           7. Injury
           8. Attitude
           9. Course: dropdown selection or create one from current workout
           10. Terrain
           11. Difficulty
     3. Reports – to be determined
  2. Specify the data formats and data structures to be used for storing and processing the data.

# Reporting Requirements

* 1. Specify the types of reports to be generated by the application, such as calendar views, statistics, and charts.
  2. Specify the tools and techniques to be used for generating the reports, such as Python or R scripts, charting libraries, etc.

# Analytics Requirements

* 1. Specify the types of analytics to be performed on the logged data, such as trend analysis, correlation analysis, and clustering.
  2. Specify the tools and techniques to be used for performing the analytics, such as Python or R scripts, machine learning algorithms, etc.

# Design Requirements

* 1. Specify the design principles and guidelines to be followed for the application, such as UI/UX standards, branding guidelines, and accessibility standards.

# Legal Requirements

* 1. Specify any legal requirements that need to be met by the application, such as GDPR, CCPA, or HIPAA compliance.

# Project Timeline

* 1. Specify the project timeline, including major milestones and deadlines for each phase of the project.