LEVL - Longevity Protocols App - Matching Algorithm

Company Description:
LEVL is an AI longevity startup targeting the biology of aging to create novel nutraceutical formulations and personalized protocols to help people live longer, healthier lives.

By leveraging the tools of AI drug discovery to identify synergistic combinations of naturally derived ingredients, certain formulations are emerging that rival the potency of comparable pharmaceuticals without the side effects and regulatory timelines of traditional drug development. Our first Patented formulation using this process mimics fasting-induced cellular rejuvenation without the need for caloric restriction, and in our testing is comparable to the leading anti-aging pharmaceutical, Rapamycin.
We are commercializing these breakthroughs under the LIFESPAN+ brand to deliver foundational cellular support, tackling the root causes of age-related decline while providing immediate functional benefits of Energy, Sleep, Focus, Calm, etc.
Our companion app dynamically optimizes personalized longevity protocols based on users' biomarkers and qualitative feedback, effectively slowing their pace of aging.

Students will directly contribute to developing our open-source longevity knowledge graph, powered by the frontier of aging research and anonymized user data, to democratize anti-aging research in pursuit of LEVL's ultimate mission: Achieve Longevity Escape Velocity, and eliminate age-related disease.

Preferred Team Size: 3-5

Location: Remote - With virtual access to the team throughout the entire program

Project Summary:
Objective:

Build LEVL's recommendation layer. The engine must translate de-identified user data into an adaptive sequence of interventions that maximizes health impact while respecting budget, effort, and risk tolerance. Your logic will also quantify the benefit of each modality through transparent Longevity Scores and integrate real-time biological-age feedback.

Design the intelligence layer that converts LEVL's de-identified user signals into day-to-day guidance and long-term outcome metrics. This engine must (1) sequence new interventions at a pace users can absorb, (2) quantify the additive or antagonistic effects of every modality and compound, and (3) translate real-time biological-age feedback into an easy-to-read Longevity Score hierarchy. Your work will sit between the Core Platform's raw feature stream and every other research pipeline—closing the loop between measurement, recommendation, and verified impact.

   Core Deliverable: Longevity Modality Personalization

- Modality Database Sync: work with the LEVL data team to pull the canonical Longevity Modalities database through a scheduled API/webhook, auto-ingest any new or updated modalities, and refresh recommendation weights without redeploying code.
- Knowledge-Graph-Driven Modality Refresh: on a scheduled cadence, query the Longevity Knowledge Graph for newly added modalities and updated efficacy signals, auto-ingest these changes into the Matching Engine's modality store, and re-compute recommendation weights in real time—no redeploy or manual intervention required.
- Paced Rollout Scheduler: introduce modalities at a reasonable interval; track adherence and evaluation window; automatically scale, pause, or retire modalities based on individual efficacy
- Synergy & Interaction Manager: ingest real-time supplement events from the Core Platform, cross-check for Synergy-engine–flagged antagonisms, and suppress or reschedule conflicting modalities before final recommendations. Promote and combine modalities flagged as synergistic.
- Preference Slider Interface: accept continuous inputs for budget, effort tolerance, risk aversion, side-effect sensitivity, and evidence rigor; persist per user
- Composite Longevity Score: calculate an overall 0–99 plus subsystem scores for functional domains (Sleep, Metabolism, Cognition, Energy, Immunity) and organ systems (Heart, Brain, Liver, Eyes)
- Pace of Aging Linkage: integrate the Matching Engine with the separate Pace-of-Aging Algorithm team's service through a shared, versioned API—pull each user's latest normalized pace metric, adjust modality weights accordingly,
- Impact Drill-Down UI: click-through pane that shows each modality's contribution to the overall and subsystem scores, including hallmarks-of-aging mapping and effect-size rationale, with links to relevant scientific sources
- Popular / featured influencer stacks discovery: provide a browsable gallery that surfaces the most-effective, trending, or influencer-curated protocol stacks and lets users copy or share them
- Manual modality addition: let any user add a custom modality to their own protocol via a simple in-app form (name, category, schedule, brief purpose) with no admin or developer step required.
- Rule Authoring DSL: YAML/JSON rule bundles hot-reloadable at runtime so scientists can adjust weights without redeploying code
- Simulation Test Harness: synthetic cohort generator used in CI to regression-test new rule sets and detect pathological loops
- AI Longevity Coach: on-device, privacy-preserving natural-language agent that can explain trade-offs, suggest next steps, and add modalities on the user's behalf while A/B testing habit adoption. Voice or text interaction. Select from multiple different coaching styles (i.e. Disciplinarion, or Friendly and supportive)

Scientific Relevance

The project operationalizes translational geroscience: mechanistic findings, clinical biomarkers, and user-reported outcomes are fused into a transparent decision engine that personalizes protocols while generating large-scale, continuously improving evidence. By tying every recommendation to its quantitative impact on biological age and functional subscores, the system makes longevity science actionable for individuals and auditable for researchers.

Stretch Goals

- Reinforcement-learning layer to auto-tune rule weights from historical outcome uplift
- Genotype-aware modifiers that adjust scores for high-impact SNPs
- Cluster analysis to surface "people-like-you" protocol archetypes and enable social discovery
- Proactive Healthcare Prompter: surface time-appropriate clinical actions (e.g., CAC scan, Grail test, MRI, colonoscopy) based on risk tier and insurance constraints
- Profile Completion Metric: compute a 0–100 score from demographics, lifestyle, goals, and health metrics to prioritize onboarding prompts
- Protocol Adherence Reputation Score: compute a rolling 0–100 adherence metric based on accurate completion and timely recording of modalities (weighted for event importance and recency) that is exposed via API to the DCT Platform and the pricing/discount logic.

Desired Skill Set:
Ideal for students who enjoy algorithm design, decision systems, and applied data science. Proficiency in a typed general-purpose language (Python or TypeScript) and experience with rule engines or config-driven logic are central. Comfort with data-frame libraries (Pandas/Polars), basic statistics, and writing automated test suites will accelerate development. Familiarity with YAML/JSON schema design, lightweight visualization (React/Next.js or Streamlit for internal dashboards), and containerized deployment is advantageous. Above all, the project rewards rigorous thinking, clean architecture, and an appetite for translating complex biology into actionable code.

Student Benefits:

1. Students learn how to translate biomedical research and user signals into a live decision engine, blending rules-based logic with real-time data to deliver personalized, quantifiable health guidance.
2. Gain hands-on experience with frontier models, scientific literature parsing, knowledge graph construction, and health optimization.
3. Enjoy creative freedom to design and solve open-ended, high-impact problems that push the frontiers of human life extension.
4. Each team will ship an independent, modular contribution with clear ownership and a path to public demo or open-source release.
5. Top-performing students may be invited to continue working with LEVL or be referred to partner startups in the healthtech and AI space.

6. Complimentary LIFESPAN+ products to improve sleep, boost energy & focus, and mitigate the effects of stress.

IP Rights:
Students will be asked to sign a proprietary information and intellectual property assignment agreement. Intellectual property rights to all code, data, and documentation will be retained by LEVL, Inc.

Contact Information:
Kylen McClintock: CoFounder & CEO LEVL, Inc. Kylen@LEVLHealth.com. (6085128327)