|  |
| --- |
| **Mini project Brief data** |

|  |  |
| --- | --- |
| Group No. and Division | Title of the mini-project |
| 2-C | **LifeMetrics: Your Personal Health and Wellness Dashboard** |
| Name of the Members | Email address &Phone number |
| Anushka Tandon  Rosy Thakur  Yagnita Patel  Jyoti Kumari Sah | [anushka.tandon.btech2023@sitpune.edu.in](mailto:anushka.tandon.btech2023@sitpune.edu.in)  [rosy.thakur.btech2023@sitpune.edu.in](mailto:rosy.thakur.btech2023@sitpune.edu.in)  [yagnita.patel.ntech2023@sitpune.edu.in](mailto:yagnita.patel.ntech2023@sitpune.edu.in)  [jyotikumari.sah.btech2023@sitpune.edu.in](mailto:jyotikumari.sah.btech2023@sitpune.edu.in) |
| Description of The Mini Project | |
| The Arduino-Based Wellbeing Checking Framework is a refined undertaking intended to gauge and show crucial wellbeing measurements, including pulse, blood oxygen levels, dampness, and temperature. Using an Arduino Uno R3, this framework coordinates a heartbeat sensor for exact pulse readings, an oxygen sensor to screen blood oxygen immersion, and DHT11 or DHT22 sensors for natural dampness and temperature estimation. Continuous information is introduced on a LCD screen, guaranteeing quick openness for clients. This venture is great for wellbeing lovers and understudies the same, giving an imaginative and down to earth way to deal with wellbeing checking while at the same time enabling clients to assume command over their prosperity. | |
| How are the problems solved/outstanding need of the project met? | |
| How LifeMetrics Takes care of Issues and Meets Exceptional Needs:  1. ***Fragmented Wellbeing Data***: Existing arrangements frequently track just unambiguous angles (e.g., wellness or rest) without incorporating psychological well-being or sustenance.  - ***Solution***: LifeMetrics combines information from numerous sources (wearables, applications) to give a ***holistic view*** of the client's physical, mental, and profound wellbeing, tending to the requirement for brought together wellbeing following.  2. ***Lack of Personalization***: Numerous wellbeing applications offer conventional guidance, making it difficult for clients to make noteworthy strides.  - ***Solution***: LifeMetrics utilizes ***AI-driven insights*** in view of individual information to offer ***personalized recommendations*** for nourishment, exercise, rest, and mental prosperity, giving clients significant, customized direction.  3. ***User Commitment and Motivation***: Conventional stages might need objective setting highlights or continuous inspiration, gaining it harder to keep up with headway.  - ***Solution***: LifeMetrics permits clients to \*\*set custom wellbeing goals\*\*, \*\*track progress\*\*, and gives \*\*reminders and persuasive tips\*\*, guaranteeing better commitment and long haul responsibility.  4. ***Mental Wellbeing Tracking***: Numerous wellbeing stages ignore emotional wellness, zeroing in just on actual prosperity.  - ***Solution***: LifeMetrics incorporates \*\*mood following, stress monitoring\*\*, and \*\*mindfulness tools\*\*, tending to the exceptional requirement for extensive emotional well-being support close by actual wellbeing measurements.  5. ***Overload of Information Without Insight***: Clients frequently get crude information without grasping its importance (e.g., pulse, rest designs), making it hard to follow up on it.  - ***Solution***: LifeMetrics makes an interpretation of crude information into clear, noteworthy insights, assisting clients with understanding patterns and settle on informed choices to further develop their general prosperity.  By tending to these holes, LifeMetrics addresses the issue for a complete, customized, and client friendly wellbeing and health stage. | |
| Identify the elements that are considered novel | |
| Novel Components of the Arduino-Based Wellbeing Observing Frame work :-  1.**Multi-Sensor Integration**: Joins pulse, blood oxygen, mugginess, and temperature sensors for a complete wellbeing outline.  2.**Real-Time Information**: Visualization: Showcases wellbeing measurements on a LCD screen for simple checking.  3.**Affordable Do-It**-Yourself Approach: Uses minimal expense Arduino parts, making wellbeing observing available.  4.**Educational Tool**: Shows clients gadgets and programming through viable applications.  5.**Environmental Awareness**: Estimates moistness and temperature to feature their effect on wellbeing.  6.**Data Logging Capability**: Empowers following of wellbeing patterns after some time for better administration.  7.**Customization Potential**: Open-source plan permits clients to fit the framework to their necessities.  These components make the framework a remarkable and significant asset for wellbeing observing and training. | |
| Usefulness/Any Advantages Of The Invention Over Currently Available Technology | |
| Benefits of LifeMetrics Over Current Technology:  1. **Holistic Wellbeing Tracking**: Joins physical, mental, and close to home wellbeing information in one stage, dissimilar to numerous applications that emphasis on a solitary perspective (e.g., wellness or rest as it were).  2.**Personalized man-made intelligence Insights**: Uses computer based intelligence to give customized wellbeing suggestions, offering proactive counsel in light of ongoing information — current frameworks frequently need progressed, noteworthy experiences.  3.**Cross-Stage Integration**: Matches up flawlessly with numerous wearables (e.g., Fitbit, Apple Watch) and wellbeing applications (e.g., Google Fit), guaranteeing an additional exhaustive informational collection than contenders.  4.**Goal-Oriented**: Empowers customized objective setting and progress following across different wellbeing aspects, not at all like a few stages that limit clients to predefined objectives.  5.**Mental Wellbeing Focus**: Offers state of mind following and stress examination through pulse fluctuation (HRV), filling a hole in numerous wellness and wellbeing applications that ignore mental prosperity. | |
| **Any other additional description/ Attachments /Manuscript disclosing the current mini-project** | |
| **Objective:**  The objective of the LifeMetrics small scale project is to foster a model of an individual wellbeing and health dashboard that combines different information streams into a solitary, easy to understand stage. The dashboard will zero in on following physical, mental, and close to home wellbeing, giving customized experiences and proposals to assist clients with accomplishing their health objectives.  **Key Parts:**  **Information Combination:**  Sync with wearable gadgets (e.g., Fitbit, Apple Watch, Garmin) and wellbeing applications (e.g., Apple Wellbeing, Google Fit).  Gather information on indispensable signs (pulse, circulatory strain), actual work (steps, exercises), and rest designs.  **Wellbeing Measurements:**  Track key wellbeing pointers: pulse, internal heat level, calories consumed, rest quality, and temperament.  Use calculations to evaluate patterns and ready clients of any anomalies (e.g., hypertension, unusual rest designs).  **UI:**  Foster a straightforward, outwardly instinctive dashboard that offers:  Everyday wellbeing synopses.  Customized suggestions (e.g., tips to further develop rest or diminish pressure).  Progress following for wellness, rest, and mental prosperity.  **Simulated intelligence Driven Bits of knowledge:**  Coordinate AI models to break down information and proposition significant experiences.  Model: Assuming unfortunate rest quality is distinguished, the framework will recommend changes in rest cleanliness or care works out.  **Objective Setting and Inspiration:**  Permit clients to lay out custom objectives (e.g., get thinner, work on cardiovascular wellbeing) and track progress over the long haul.  Send warnings and suggestions to empower objective fulfillment and propel clients to remain dynamic.  **Security and Protection:**  Guarantee all client information is safely put away and consistent with information security regulations (e.g., HIPAA, GDPR).  Empower clients to control information offering to medical services suppliers or outsiders.  **Specialized Necessities:**  Frontend: Online dashboard (HTML/CSS/JavaScript) for straightforward entry across gadgets.  Backend: Information total from APIs (e.g., wearable gadgets, wellbeing applications) with secure distributed storage.  Artificial intelligence/ML: Python-based calculations for information investigation and wellbeing experiences.  **Current Status:**  UI/UX configuration: Starting wireframes for the dashboard interface.  Information Joining: Fundamental combination with Google Fit and Fitbit Programming interface.  Artificial intelligence Models: Straightforward relapse models for action following and rest investigation. | |
| (Optional) Labelled sketches/figures to detail the project | |
|  | |
| Please list relevant literature (patent/paper) to identify the prior work done by others | |
| **Patents:**   1. **US Patent 9,271,117** – "Health Management System"    * **Summary:** Describes a system that collects health-related data from multiple devices (wearables, smartphones) and provides personalized insights based on this data.    * **Relevance:** Multi-device integration and personal health insights are core to LifeMetrics. 2. **US Patent 10,329,660** – "Wearable Health Monitoring System"    * **Summary:** A system for real-time monitoring of biometric data, including heart rate, temperature, and physical activity, with cloud integration for long-term analysis.    * **Relevance:** Covers health data aggregation and wearable tech integration, similar to LifeMetrics. 3. **US Patent 9,980,614** – "Personal Health Dashboard"    * **Summary:** Describes a user interface that provides real-time health information and alerts, integrating data from multiple sources.    * **Relevance:** Aligns with LifeMetrics’ dashboard that aggregates and presents health data. 4. **US Patent 10,043,763** – "Fitness Tracking and Motivation System"    * **Summary:** Focuses on tracking fitness data and offering motivational feedback to users, using wearable technology.    * **Relevance:** Motivation and goal setting in wellness tracking are key components in LifeMetrics.   **Research Papers:**   1. **"Wearable Sensors for Remote Health Monitoring"** (2019)    * **Journal:** Sensors    * **Summary:** A review of wearable health sensors and their application in continuous health monitoring.    * **Relevance:** Discusses the technology and applications of health tracking wearables that feed into wellness dashboards like LifeMetrics. 2. **"Personalized Wellness Management Using Smart Devices and Data Integration"** (2020)    * **Journal:** IEEE Access    * **Summary:** Explores how smart devices, when integrated with data analysis platforms, can provide personalized wellness management solutions.    * **Relevance:** Directly related to the concept of LifeMetrics, focusing on personalized health insights and smart device integration. 3. **"Mobile Health and Fitness Applications: A Systematic Review"** (2017)    * **Journal:** JMIR mHealth and Health    * **Summary:** Reviews mobile health and fitness applications, evaluating how they help users track physical activity, diet, and overall health.    * **Relevance:** Provides background on mobile health apps that integrate similar features to LifeMetrics. 4. **"AI-Driven Health Monitoring Systems: State of the Art"** (2021)    * **Journal:** ACM Computing Surveys    * **Summary:** A review of AI-based systems for health monitoring, including predictive analytics and personalized recommendations.    * **Relevance:** LifeMetrics uses AI-driven insights for health optimization, which aligns with this work. 5. **"Impact of Digital Health Monitoring Systems on Health Outcomes"** (2018)    * **Journal:** Digital Health    * **Summary:** Discusses the impact of digital health monitoring systems on improving long-term health | |
| Any additional notes or comments? | |
| The Arduino-Based Health Monitoring System is scalable, allowing for easy expansion with additional sensors or features like Bluetooth or Wi-Fi for remote monitoring. It has low power consumption, making it suitable for portable, battery-powered applications. To ensure the accuracy of health metrics such as heart rate and oxygen levels, proper sensor calibration is critical. The user experience can be further enhanced by incorporating a mobile app for more convenient data visualization and remote access. Overall, this project offers a solid foundation for DIY health monitoring, combining affordability, functionality, and educational value. | |