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1. **PART I**

| **1. Personal Background** |
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| Below is a table where you must complete the requested information. |

| **Student Name** | **Alonso Barrera Silva, Germán Macías Hernández, Matías Muñoz Lillo, Danae Venegas Maldonado** |
| --- | --- |
| **National ID** | **21.173.065-K, 20.872.055-4, 21.564.740-4, 20.474.019-4** |
| **Degree Program / Major** | **Computer Engineering** |
| **Campus / Location** | **Antonio Varas** |

| **2. APT Project Description** |
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| **In the description, you should briefly state the name of your APT project and the graduate profile competencies you will apply. If your program defines performance areas, also mention which performance areas the project is linked to.** |

| **Project Name** | **PLift** |
| --- | --- |
| **Performance Area(s)** | **Mobile Development and Database Modeling** |
| **Competencies** | ***The competencies we will apply in the development of our project are the following:***  ***Full software development, as we will create an application from scratch with functionalities such as training planning, weight tracking, coach-athlete communication, and artificial intelligence.*** |

| **3. APT Project Rationale** |
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| **Below are various fields that you must complete with the requested information. This section aims for you to describe your project in detail and justify its relevance and significance.** |

| **Relevance of the APT Project** | ***In the field of powerlifting and strength training, personalized planning is crucial for both progress and injury prevention. However, in the Chilean context, many coaches face a heavy workload when managing multiple athletes, spending significant amounts of time adjusting plans and manually monitoring performance using only Excel templates. Currently, most available applications are designed either for individual use or as generic logs, lacking specific features for the coach–athlete relationship. This leads to:***   * ***Loss of time in repetitive administrative tasks*** * ***Difficulty dynamically adjusting plans according to progress or fatigue*** * ***Limited personalization in competition preparation***   ***PLift aims to address these challenges with a mobile app specialized for powerlifting coaches and athletes, enabling:***   * ***Generation of personalized training cycles based on the athlete’s initial data*** * ***Automatic adjustment of loads and volumes through AI according to recorded performance*** * ***Centralized monitoring of all athletes by coaches from a single dashboard***   ***The relevance for the field of Computer Engineering lies in the challenge of developing a cross-platform system with a hybrid architecture: mobile app + cloud-based backend + basic AI. This involves applying competencies in development, API integration, database management, and deployment to production, ultimately delivering a real solution for a specific niche within the sports sector.*** |
| --- | --- |
| **Description of the APT Project** | ***The objective of PLift is to develop a mobile application that enables strength and powerlifting athletes to efficiently and accessibly record, analyze, and optimize their training, even without an internet connection.***  ***The application is designed to address the current issue of maintaining scattered records in spreadsheets or notes, by offering a centralized system with fast session logging, automatic calculation of optimal loads, 1RM estimation, and progress visualization through interactive charts.***  ***To tackle this challenge, a hybrid architecture will be implemented, consisting of a mobile app + cloud-based backend + basic AI, developed with technologies such as React, Node.js, or Firebase, and a Firestore/PostgreSQL database. This will allow API integration, real-time data management, and the deployment of a stable and secure solution tailored to a specific niche in the sports sector.*** |
| **Project Relevance to the Graduate Profile** | ***This project aligns with the competencies of the Computer Engineering graduate profile, specifically:***   * ***Design and implementation of technological solutions for real-world problems.*** * ***Integration of artificial intelligence and cloud services to optimize processes.*** * ***Agile project management with a focus on minimum viable product (MVP) and scalability.***   ***To address the problem, it is necessary to apply skills in mobile development (React Native), backend with Python and FastAPI, cloud databases (Firebase), and the design of intuitive interfaces focused on coach–athlete interaction.*** |
| **Relation to Professional Interests** | ***My professional interests include mobile application development, the implementation of artificial intelligence in real-world solutions, and the creation of scalable products aimed at specific niches. PLift reflects these interests as a technological tool for a concrete sector (powerlifting coaches and athletes), enabling work with real data, applied AI, and modern architectures.  Carrying out this project will strengthen my skills in:***   * ***Design and deployment of cross-platform applications.*** * ***Creation of APIs and business logic in the cloud.*** * ***Integration of AI algorithms in production environments.*** |
| **Feasibility of Developing the APT Project** | ***The project is feasible to complete within a 4-month timeframe, considering:***   * ***Available resources: Personal laptop, Firebase (Firestore + Auth + Storage), Render/Railway for Python backend, open-source libraries.*** * ***Estimated time: 8–10 hours per week (to be reviewed).*** * ***Facilitating factors: Prior knowledge of the technologies, availability of free tools, online documentation.*** * ***Limiting factors: AI complexity and tight deadlines.*** * ***Proposed solution: Start with a simple model for 1RM calculation and basic load adjustment, leaving optimizations for later phases.*** |

1. **PART II**

| **4. Objectives** |
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| **In this section, you must define the general and specific objectives of the APT Project. It is important to note that objectives should be stated clearly and concisely, without additional explanations; they should be understandable on their own. It is recommended to write them using verbs in the infinitive form, as this ensures specifying concrete actions.** |

| **General Objective** | ***Design and implement an intelligent mobile application for powerlifting coaches and athletes that generates, manages, and adjusts training cycles using artificial intelligence, optimizing performance tracking and competition preparation.*** |
| --- | --- |
| **Specific Objectives** | ***Record and manage athletes' initial data such as 1RM, RPE, injury history, experience level, and available training days.***  ***Implement an automatic training cycle generation module based on periodization algorithms (linear, DUP, block) adapted for powerlifting.***  ***Integrate a simple AI system that dynamically adjusts loads, volume, and intensity based on the athlete’s history.***  ***Develop a dashboard for coaches to monitor multiple athletes simultaneously, with progress metrics and automatic alerts.***  ***Incorporate a competition preparation feature that adjusts programming and performance peaks according to the event date.***  ***Display metrics and trends such as estimated 1RM, weekly volume, compliance rate, and performance evolution.*** |

| **5. Methodology** |
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| **In the following section, you should describe the methodology, specific to your discipline, that you will use to carry out the previously described APT Project, including the stages and working methods.** |

| **Methodology Description** |
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| ***For the development of PLift, the Agile Scrum methodology will be used, which is optimally suited for projects requiring flexibility, incremental deliveries, and continuous feedback. This methodology will allow us to manage the application development in short cycles called Sprints, facilitating adaptation to changes and achieving partial objectives until the final product is completed.***  ***Roles:***   * ***Product Owner: Defines the vision and prioritizes the Product Backlog. (Danae Venegas)*** * ***Scrum Master: Facilitates the process and removes impediments. (Matias Muñoz)*** * ***Development Team: Implements frontend (React Native), backend/API (Python + FastAPI), and integration with Firebase and AI. (Alonso Barrera, Germán Macías, Matias Muñoz, Danae Venegas)***   ***Proposed project stages:***  ***Project Initiation:***   * ***Define product vision and scope.*** * ***Create the Product Backlog with all functionalities.*** * ***Assign team roles and responsibilities.***   ***Iterative Development through Sprints:***   * ***Sprint planning (selection of functionalities).*** * ***Develop the agreed functionalities.*** * ***Conduct testing and validation of each product increment.***   ***Project Closure:***   * ***Final testing and deployment.*** * ***Technical and functional documentation.*** * ***Project evaluation and lessons learned.*** |

| **6. Evidences** |
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| **Next, describe the evidence that will be evaluated in the progress report and the final report of your APT Project. These pieces of evidence should be agreed upon with your instructor. Evidence refers to the products developed during the project, whose purpose is to showcase or document how the work has been implemented.** |

| **Type of Evidence (Progress or Final)** | **Evidence Name** | **Description** | **Justification** |
| --- | --- | --- | --- |
| **COMPLETED** | **Kick off** | ***Document containing the initial project requirements, covering the definition, scope, objectives, roles, and limitations of the project.*** | **It is essential to define the initial guidelines of the project.** |
| **COMPLETED** | **Requirement Gathering** | **The users needs were identified and documented in an initial Product Backlog, including user stories and acceptance criteria.** | **It is key because it establishes the foundation of the project and allows the planning of Sprints with clear objectives aligned with real user needs.** |
| **COMPLETED** | **User Stories** | **The user stories were documented along with their acceptance criteria to reflect the users’ needs.** | **User stories guide development and ensure that client expectations are met.** |
| **COMPLETED** | **Initial Product**  **Backlog** | **Document containing the prioritized user stories along with their acceptance criteria.** | **It reflects the initial project planning and guides iterative development through Sprints.** |
| **Progress** | **Initial Wireframe / Mockup** | **Low-fidelity prototype of the PLift app interface, displaying the main screens.** | **It allows validation of the application’s structure and usability with the instructor and team before development.** |
| **Progress** | **Sprint Planning** | **Document that helps us plan the biweekly Sprints, outlining tasks for the team to complete and ensuring that estimated timelines are met for each Sprint.** | **It allows organizing and distributing team tasks, ensuring orderly and efficient progress during each Sprint.** |
| **Progress** | **Use Case Diagram** | **Graphical representation of the actors involved in the app and its requirements.** | **It is key to understanding how the actors interact with the system or app.** |

| **7. Work Plan** |
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| **In the following table, define the planning of your APT Project according to the requirements.** |

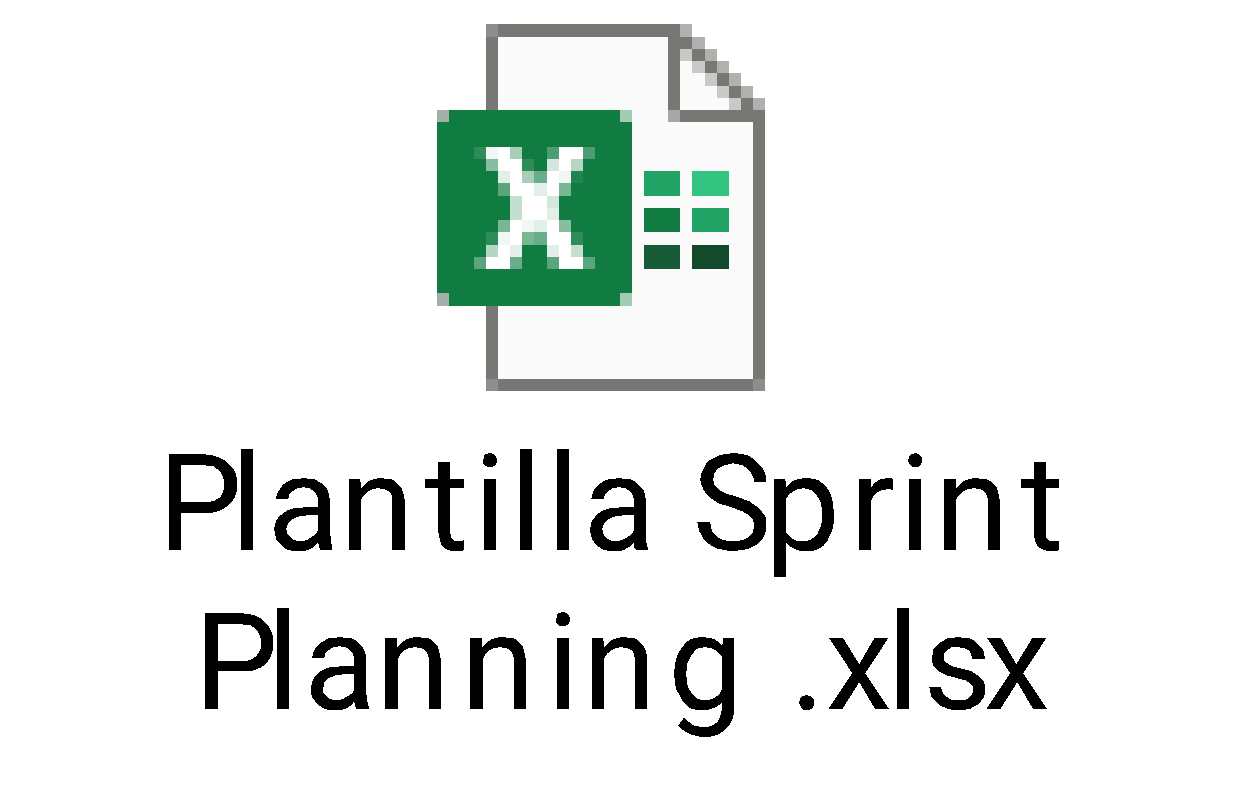
| **Plan de Trabajo Proyecto APT** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Competency or Competency Units** | **Activity/Task Name** | **Activity/Task Description** | **Resources** | **Activity Duration** | **Responsible** | **Observations** |
| ***Agile Project Management*** | ***Project Initiation and Team Organization*** | ***Define vision, scope, roles, and responsibilities. Create GitHub repository.*** | ***GitHub, initial meeting*** | ***1 hour*** | ***Matías (Scrum Master) + team*** | ***It is key to align expectations and commitments of the group.*** |
| ***Effective Communication*** | ***Requirements Gathering and Initial Product Backlog Definition*** | ***Identify user stories and acceptance criteria, prioritize the initial backlog.*** | ***Team meetings, Google Docs*** | ***2 days*** | ***Danae (PO) + team*** | ***The backlog can be adjusted during Sprint Review.*** |
| ***Innovation and Learning*** | ***Mockup Design*** | ***Prototype main screens.*** |  | |  | | --- |  | ***2 days*** | | --- | | ***Alonso, Germán*** | ***Validate prototypes with the instructor before starting development.*** |
|  | ***User Stories*** |  |  |  |  |  |

| **8. Gantt Chart** |
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| Look for a Gantt Chart format that suits you and organize the activities planned in the previous section, taking into account the period assigned for the development of your APT Project. You must maintain the academic timeline in the development of the three phases included in the Portfolio of Title course. |

**Preview**

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