A Comprehensive Report on Gym Management Systems

AFFILIATIONS

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DECLARATION

WE, AYUSHMAN SONI, DEEPANSHU SINGH, SIDDHARTH SINGH, DEEPANJALI KACHHWAHA, MIHIR SEN AND HARSH BAGWAR OF SECOND SEMESTER B.TECH., IN THE DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING FROM IIITA, PRAYAGRAJ HEREBY DECLARE THAT THE PROJECT WORK ENTITLED GYM MANAGEMENT SYSTEM IS CARRIED OUT BY US AND SUBMITTED FOR EVALUATION FOR THE AWARD OF BACHELOR OF TECHNOLOGY IN ELECTRONICS AND COMMUNICATION ENGINEERING, UNDER INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DURING THE ACADEMIC DURATION 2022- 2026 AND HAS NOT BEEN SUBMITTED TO ANY OTHER UNIVERSITY FOR THE AWARD OF ANY KIND OF DEGREE.

ABSTRACT

The system that is currently in place is manual. The member must save his details in the registers kept by the gym in this case. If the data is in the form of paper, sharing is not possible.

The Data storage via a manual technique offers very little security; some data may be lost owing to poor administration. It's a constrained system that's not as user-friendly. Finding specific information can be very time consuming and complicated. Maintaining records manually is highly challenging since manual systems are more prone to mistakes and data loss.

In order to manage details efficiently and securely, a system is needed for gym management. Additionally, it needs software for storing personnel and person data.

Gym Management Software, which proposes computerizing the current method, is developed to address these problems.

The new system must fully eliminate all manual tasks and offer an effective data entry process.

KEYWORDS

• Database Management, Design System, Machine Work, Online Registration.

ABBREVIATIONS AND NOMENCLATURE

RFID - Radio Frequency Identification Technology

MVC - Model-View-Controller

GUI - Graphical User Interface

RF - Reference

PIN -Personal Identification Number

SDLC - System Development Life Cycle

UML - Unified Modeling Language

VR - Virtual Reality

BA - Biometric Authentication

HTML - Hypertext Markup Language

SQL - Structured Query Language

AI - Artificial Intelligence

CSS - Cascading Style Sheets

Introduction

Citations

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Background

Despite the availability of numerous gym management software solutions in the market, there is still a lack of <u>comprehensive and user-friendly systems</u> that cater to the specific needs of gym owners and members.

In this context, a **Gym Management System** developed using C++ has the potential to provide an efficient and customizable solution that can help gyms to manage their daily operations, memberships, payments, and other aspects more effectively. However, to develop such a system, it is essential to conduct a thorough literature review on the existing gym management systems, their features, limitations, and best practices, as well as the use of C++ programming language for software development. This review will help to identify the gaps and opportunities for improvement in the

current gym management systems, as well as the challenges and solutions associated with using C++ for developing a robust and scalable gym management software.

The ultimate goal of this literature review is to provide a solid foundation for the development of a Gym Management System using C++ that can meet the requirements of gym owners and members and enhance their overall experience.

Problem Gap

- Most of the gym owners continue to manage their gym using the manual way at the moment. Filling out a registration form on paper is how new members are registered.
- Despite the advancement in technology, the management team still uses paper and folders to keep track of its members.
- The traditional method's application is ineffective since it will make it tough for the staff to maintain track of the records of their members. It will also make it harder for the staff to update information for individual members throughout the membership renewal process.
- The personal trainer booking process must be completed manually at the counter as per the same procedures that apply to the other services.
- Overall, the gym's manual management approach is ineffective because it did not make management of the facility a fluid process.
- Due to inefficient operations, numerous procedures are required to complete any Process when an adequate and superior system would suffice.

Problem Solution

The gym management system aims to:

- The project's major goal is to create software that makes it easier for the gym to store, maintain, and retrieve data in an organized fashion.
- To keep track of client information, staff members have access rights to change and delete records, and ultimately, the services the gym offers its clients.
 Additionally, only employees are permitted to access any databases and make decisions, required adjustments, if any.
- To provide user-friendly software that manages the staff-customer relationship in a productive way.

• To create a system that is simple to use and needs little user education. The majority of the features and functionality are comparable to those found on any Windows platform.

<u>Literature Survey</u>

REFERENCE 1

Background:

There is a need for the software to ensure the gym operates effectively. Being healthy is becoming more and more popular. The majority of people prefer the gym for maintenance because of this. Swimming and exercise are two other excellent ways to keep oneself fit and healthy.

Unfortunately, they take a lot of time. As a result, most people choose to join a gym to maintain their bodies. There are numerous benefits to joining a gym. The first are the usage of the facilities, the skilled trainer, and the inspiration one finds in the gym. A Gym Management system built on struts and the hibernate framework is proposed as a solution to this issue.

Objective:

To eliminate the restrictions of the current software by using Smart Gym Management System which is more intelligent than the current software due to improvements in efficiency and effectiveness, automation, accuracy, user-friendliness, information availability, communication capacity, maintenance, and cost reduction.

Application:

The MVC architecture is used in this system. The system makes managing libraries easier and is well-suited for expansion. Any company that does not have a website is losing out on one of their most effective marketing tools. Having a website is crucial for businesses because it increases the likelihood that customers will find you. Most customers these days will investigate items and businesses online before making a purchase. The client typically utilizes MS Excel or paper to keep track of their records; however, sharing data from many systems in a multi-user environment is not viable without a lot of duplication of effort and the potential for error. They must update each and every excel file whenever the records are altered. Most of the restrictions of the current software are eliminated by the Smart Gym Management System. Our system is more intelligent than the current system due to improvements in efficiency and effectiveness, automation, accuracy, user-friendliness, information availability, communication capacity, maintenance, and cost reduction.

Due to the vulnerability of traditional password-based security methods, we see more occurrences of cybercrime, data modification by unauthenticated users, hacking of personal accounts, etc. today. Since the system uses software to identify or validate the user by comparing the data being provided with the digital photographs of the individual's distinctive characteristics, biometric authentication technology is impenetrable to hacking.

Method:

A design for managing online databases and transactions is presented in this paper. Information about employees, members, facilities, salaries, receipts, and items can be managed via the design system. Additionally, it has the capability of performing an immediate, effective search using advanced search. This system offers graphical user interface (GUI)-based data saving and report generating. The project gym management system is designed to reduce the time needed for the current system. In the previous system, all records were on paper, which meant that if a piece of paper was lost, all of the records would be lost as well. To get around all of these issues, the gym management system project was created.

These enable the maintenance and security of all records. Software that keeps records of personnel and individual data is also necessary.

A key indicator of a student's commitment, competence, and status is attendance verification. Automated attendance has been handled by a variety of systems. Most of these implementations were created using a single factor template, which is a security flaw. By utilizing biometrics and radio frequency identification technology, various applications, including authorisation, data access, and access control, have experienced rapid development in recent years. The goal of this research is to develop a smart protocol for RFID authentication that incorporates finger-print biometric data in addition to confidentiality, identity verification, and data protection assurances.

RFID offers minimal complexity, biometric systems offer data integrity and security, and the proposed method's technical programming style offers an average run time.

Result:

The implementation of a gym management system that utilizes both RFID and Biometrics Authentication methods can provide several benefits for gym owners and members. By combining the use of RFID technology with biometric authentication, the gym management system can provide an extra layer of security and convenience for gym members.

By integrating these two authentication methods, gym owners can ensure that only authorized members are allowed to access the gym, while also providing a seamless

and convenient access process for members. Additionally, the gym management system can keep track of member attendance, workout schedules, and other important information, which can help gym owners to better manage their operations and improve the overall experience for members.

Comparison:

The customer keeps track of their records using MS Excel or paper, but it is not possible for them to share the data from numerous systems in a multi-user environment, meaning there is a lot of duplication of effort and a risk of error. Once records are altered, each Excel file needs to be updated. The majority of the drawbacks of the current software are rejected by the Fitness System. Our system is more intelligent than the current system due to improvements in efficiency and effectiveness, automation, accuracy, user-friendliness, information availability, communication capacity, maintenance, and cost reduction. The issue of the typical Java Web application's low maintainability and expandability can be effectively resolved by this technology.

Conclusion:

Overall, a gym management system that uses RFID and biometric authentication can enhance security, improve access control, and streamline gym operations, making it a valuable investment for gym owners and a convenient and safe experience for gym members.

Limitations:

- **1.** Limited scalability: Depending on the design and implementation of the system, it may be difficult to scale up the gym management system to accommodate larger numbers of users, customers, or facilities. This can result in slower response times or system crashes.
- **2.**Security issues: Customer financial and personal information is frequently stored in gym management systems, making them susceptible to hacking or data breaches if not properly protected. The gym and its patrons may suffer legal or financial repercussions as a result.
- **3**.Technical limitations: Depending on the technology used to build the system, there may be certain technical limitations that prevent the gym management system from functioning optimally, such as compatibility issues with certain devices or operating systems.

Future:

RFID (Radio Frequency Identification) and biometric authentication technologies have the potential to significantly improve the efficiency and security of gym management systems in the upcoming future.

RFID technology can be used to track the movement of customers and equipment within the gym, providing real-time data on which equipment is being used, when, and by whom. This can help gym owners optimize their facilities and resources, such as identifying popular workout times or equipment that needs maintenance.

Biometric authentication, such as fingerprint or facial recognition, can provide a more secure and convenient way for customers to access the gym and its facilities. It eliminates the need for physical access cards or PIN codes, reducing the risk of theft or unauthorized access. Biometric authentication can also help gym owners monitor and control access to specific areas within the gym, such as locker rooms or private training areas.

In addition, RFID and biometric technologies can be integrated with gym management software to provide a more seamless and efficient experience for customers. For example, customers could use their biometric authentication to check in to the gym, access their personal training programs or nutrition plans, and track their progress over time.

Overall, the application of RFID and biometric authentication in gym management systems has the potential to offer a more efficient, secure, and convenient experience for both gym owners and customers in the upcoming future.

REFERENCE 2

Background:

The demand for gym management systems has grown as a result of the fitness industry's rapid expansion in recent years. Owners and managers of gyms require a reliable method for processing payments, tracking attendance, and managing member information. Many of the currently available gym management systems, however, are out of reach for small or medium-sized gyms because they are either overly complicated or too expensive.

This problem is addressed in "Design and Development of a Gym Management System" by Shivam Gupta and Ravi Kumar by creating an economical, user-friendly

gym management system. The platform offers them an easy-to-use platform to track member activity and analyze data to make data-driven decisions. The system is designed to be accessible to gym owners and managers with minimum technical skills.

The significance of data analytics and attendance tracking in the fitness sector is also highlighted in the report. Gym owners and managers can enhance operations and client happiness by observing member behavior patterns and spotting trends.

The background for "Design and Development of a Gym Management System" as a whole emphasizes the necessity of an effective and easily accessible gym management system, as well as the significance of attendance monitoring and data analytics in the fitness business. The goal of the study is to enhance gym operations and patron happiness while offering a workable solution to these problems.

Objective:

The aim of Shivam Gupta and Ravi Kumar's 2020, "Design and Development of a Gym Management System," is to create a software system that can effectively manage various aspects of a gym or fitness center, such as member management, employee management, equipment management, schedule management, and billing management.

The system is intended to automate a number of operations and duties associated with managing a gym, including scheduling classes, tracking member attendance, managing employee schedules and payroll, and creating bills and invoices. The authors want to create a system that is simple for members and gym personnel to utilize.

Application:

The fitness sector can use the gym management system that Shivam Gupta and Ravi Kumar created in "Design and Development of a Gym Management System" in a number of ways.

First off, the system's attendance tracking tool can assist gym owners and managers in tracking member involvement, spotting patterns in member behavior, and streamlining operational processes. Gym owners may learn which courses and activities are most popular with members by measuring member attendance. Based on this information, they can change the class schedule or introduce new programmes. The method can also help gym owners locate inactive members so they can get in touch with them and possibly increase client retention.

Second, the system's payment processing capability can assist gym managers and owners in effectively managing member payments and minimizing administrative duties.

Finally, the system's data analytics feature can support data-driven decision-making by gym managers and owners. Fitness center owners may spot trends and decide which programmes to provide, when to schedule courses, and how to increase client happiness by looking at member behavior patterns.

Overall, by offering a user-friendly platform for attendance tracking, payment processing, and data analytics, the gym management system established in "Design and Development of a Gym Management System" can enhance gym operations and client pleasure.

Method:

The approach adopted by Shivam Gupta and Ravi Kumar in "Design and Development of a Gym Management System" entails the creation of a gym management system with attendance tracking and analytics tools. According to a software development life cycle (SDLC) methodology, the study goes through the following stages:

- Gathering requirements: The writers interviewed gym managers and owners to learn about their needs and pain areas in order to gather requirements for the gym management system. In this stage, existing gym management systems were examined to determine their advantages and disadvantages.
- 2) System analysis and design: Based on the requirements acquired in the first phase, the writers created the system architecture, data model, and user interface at this stage. The choice of relevant technologies and tools for the system's development was also a part of this step.
- 3) Implementation: Using the chosen technologies and tools, the writers created the gym administration system. The system's functions, including member registration, attendance monitoring, payment processing, and data analytics, were coded during this phase.
- 4) To find any faults or problems, the writers tested the gym management system in a real-world situation at a nearby gym. Performance, usability, and usefulness of the system were evaluated.
- 5) Deployment and maintenance: In the last stage, the authors trained the gym employees and installed the gym management system at the neighborhood gym. The system's maintenance and support requirements were also covered by the authors.

The technique taken in "Design and Development of a Gym Management System" is a thorough one that includes requirements gathering, system analysis and design, implementation, testing, deployment, and maintenance.

Results:

The outcomes of Shivam Gupta and Ravi Kumar's "Design and Development of a Gym Management System" include the effective design and implementation of a gym management system with attendance monitoring and analytics tools.

The user-friendly interface for member registration, attendance monitoring, payment processing, and data analytics is part of the gym administration system created for the study. Gym owners and management may measure member involvement and spot behavioral trends thanks to the attendance tracking feature. The automatic payment processing and billing made possible by the payment processing feature lessens the administrative work required by the gym staff. By examining member behavior trends, the data analytics function enables gym owners and managers to make data-driven decisions.

The local gym served as the testing ground for the gym management system, which was determined to be useful, usable, and working well. The device was well-received by the gym personnel, who thought it was simple to use and effective. According to the authors, small to medium-sized gyms searching for a practical way to manage member information, track attendance, and process payments should consider a gym management system.

Overall, the outcomes of "Design and Development of a Gym Management System" show how successfully a gym management system can be created and put into use in order to enhance client happiness and gym operations.

Comparison:

- 1) The study's produced gym management system differs from larger, more complicated gym management systems in that it is intended to fulfill the demands of small to medium-sized gyms, which may have distinct requirements and features.
- 2) The creation of the gym management system was ensured to be scientific and effective by using a software development life cycle (SDLC) technique, which is a common methodology in software development.
- 3) The study's built gym management system has standard functions like analytics and attendance tracking, but it also stands out from competing systems thanks to its user-friendly interface and automatic payment processing features.
- 4) The study's real-world testing of the gym management system at a nearby gym is an important component since it shows how well the system works in a real-world scenario.

Conclusion:

A gym management system with attendance monitoring and analytics features has been successfully developed and implemented, as shown in the study "Design and Development of a Gym Management System" by Shivam Gupta and Ravi Kumar. The study employs a software development life cycle (SDLC) strategy to enable the methodical and effective development of the system. The gym management system is intended to fulfill the needs of small to medium-sized gyms.

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Overall, "Design and Development of a Gym Management System" makes a significant contribution to the software development and gym management fields. The study highlights the need of using an organized and effective method for developing software as well as the advantages of testing software in a real-world environment to ensure its effectiveness.

Limitations:

The authors Shivam Gupta and Ravi Kumar's "Design and Development of a Gym Management System" may have the following drawbacks.

1) Restricted range: The development of a gym management system for small to medium-sized gyms is the main goal of the project. This restricts the findings' applicability to bigger or more sophisticated gym management systems.

A small sample size Because only one local gym was used for testing the gym management system, it is difficult to extrapolate the results to other gyms or fitness facilities.

2) There is no control group: The created gym management system is not compared to other gym management systems or to a control group without any management system in the study. Therefore, it is challenging to assess the relative benefits or drawbacks of the constructed system.

- 3) Technical restrictions: The study lacks information about the gym management system's technical needs or specifications, which could be important for its implementation and use.
- 4) Conducted over a brief period of time, the study may not have adequately captured long-term utilization or the effectiveness of the gym management system.
- 5) Limited scope: Although the study covers analytics and attendance tracking, it leaves out other possible capabilities like marketing automation or inventory management, which may be crucial for some gyms.

Future:

Based on the results of this study, there are a number of potential future avenues for the development of gym management systems as technology develops:

- 1) Integration of wearable technology: Gym-goers are growing more and more interested in wearable technology, such as fitness trackers and smartwatches. Gym owners and managers could benefit from a more personalized and engaging experience for members as well as additional data to help with decision-making by integrating wearable technology with gym management systems.
- 2) Analyzing member behavior patterns is made possible by the study's enhanced data analytics features, which gym owners and management can use. In the future, these functionalities might be improved to incorporate more sophisticated data analysis methods, such machine learning or predictive analytics, to deliver insights and suggestions that are more accurate.
- 3) Mobile app development: Tracking workouts and progress with mobile applications is becoming a more and more common practice among gym-goers. The creation of mobile apps that interface with gym management systems could give users a more seamless and practical experience while also improving communication between gym managers and owners.
- 4) Integration of virtual reality: Virtual reality (VR), a cutting-edge technology, has the potential to revolutionize the fitness sector. Gym owners and managers might develop fresh and creative workout programmes while also improving the immersive and engaging experience for gym-goers through the integration of VR with gym management systems.

REFERENCE 3

Background:

The fitness industry has grown significantly over the past few years, leading to a rise in the number of gyms and fitness centers worldwide. With this growth, the demand for more efficient gym operations and better services has also increased. Gym management systems have emerged as a solution to these challenges, allowing gym owners to automate administrative tasks, track member attendance, and manage equipment usage.

Gym management systems can also provide real-time data about user behavior, feedback, and preferences, which can help gym owners make data-driven decisions and improve the quality of their services. Additionally, gym management systems can enhance the user experience by providing features such as online payments, SMS notifications, and personalized workout plans.

Despite the benefits of gym management systems, many gym owners may find it challenging to choose the best system for their needs, given the wide variety of systems available in the market. This has led to a need for research in this area to design and develop more efficient and user-friendly gym management systems.

The paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohamed F. Tolba addresses this need by designing and developing a gym management system that is efficient, user-friendly, and effective in improving the quality of gym operations and the user experience.

Objective:

The objectives of the paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohamed F. Tolba are as follows:

- 1) To design and develop a gym management system that is efficient and user-friendly.
- 2) To evaluate the effectiveness of the developed system in improving the quality of gym operations and the user experience.
- 3) To compare the developed system with existing gym management systems in terms of features, user-friendliness, and effectiveness.
- 4) To identify the limitations of the developed system and suggest future improvements.
- 5) To contribute to the research in the field of gym management systems and provide insights for further development and enhancement of such systems.

Application:

The paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohamed F. Tolba has the following applications:

- 1. Gym owners and managers can use the developed gym management system to automate administrative tasks, track member attendance, and manage equipment usage, thus improving the efficiency of gym operations.
- 2. Gym members can use the system to access personalized workout plans, track their progress, and receive SMS notifications about class schedules, thus improving their experience at the gym.
- The developed system can serve as a model for the design and development of gym management systems in other fitness facilities, helping to improve the quality of services offered in the fitness industry.
- 4. The research conducted in the paper can provide insights for the development of other related systems, such as health and wellness apps, which can be used to improve the health and wellbeing of individuals.
- 5. The paper can also be used by researchers and academics as a reference for further research in the field of gym management systems and related areas.

Method:

The paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohamed F. Tolba used the following methods:

- Literature review: The authors conducted a review of existing literature on gym management systems, identifying the gaps and limitations of the existing systems.
- 2. Requirements gathering: The authors collected the requirements for the gym management system by interviewing gym owners, managers, and members, and identifying their needs and preferences.
- 3. System design: The authors designed the gym management system based on the gathered requirements, using UML diagrams and flowcharts to depict the system's functionality.
- 4. System development: The authors developed the gym management system using web development technologies such as HTML, CSS, and JavaScript, and a back-end framework such as PHP and MySQL.
- 5. System testing: The authors tested the developed system using various scenarios and user cases to ensure its functionality, usability, and reliability.

- 6. Evaluation: The authors evaluated the effectiveness of the developed system by comparing it with existing gym management systems in terms of features, user-friendliness, and effectiveness.
- 7. Data analysis: The authors analyzed the data collected from the evaluation to identify the strengths and weaknesses of the developed system and suggest future improvements.

Overall, the paper used a combination of qualitative and quantitative research methods to design and develop an efficient and user-friendly gym management system.

Result:

The gym management system developed in the paper was well-received by both gym owners and users. The system improved the overall efficiency of gym operations by automating administrative tasks and providing real-time data about equipment usage, user attendance, and user feedback. The system also enhanced the user experience by providing features such as SMS notifications and online payments.

Comparison:

The paper compared the gym management system developed in the paper to other gym management systems available in the market. The authors noted that their system was more user-friendly and efficient than other systems, and provided real-time data to help gym owners make data-driven decisions.

Conclusion:

The paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohamed F. Tolba provides valuable insights into the design and development of an efficient and user-friendly gym management system. The authors conducted a thorough review of existing literature, collected the requirements from gym owners, managers, and members, and developed a system that addressed the identified gaps and limitations of existing systems.

The developed gym management system was evaluated against existing systems and was found to be more efficient, user-friendly, and effective in managing gym operations and improving the user experience. The authors also identified the limitations of the developed system and suggested future improvements, such as incorporating artificial intelligence and machine learning algorithms to personalize the user experience. Overall, the paper provides a comprehensive approach to designing and developing a gym management system that can improve the quality of services offered in the fitness industry. The paper can serve as a reference for gym owners, managers, and researchers interested in developing and enhancing gym management systems.

Limitation:

The paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohamed F. Tolba has the following limitations:

- Limited sample size: The authors collected the requirements for the gym management system by interviewing a limited number of gym owners, managers, and members. A larger sample size would have provided more comprehensive insights into the needs and preferences of gym users.
- 2. Limited geographic coverage: The study was conducted in a specific geographic location, which may limit the generalizability of the results to other regions.
- 3. Limited focus: The study focused on the development of a web-based gym management system and did not consider other technologies such as mobile applications or wearables.
- 4. Lack of user adoption testing: The study did not test the adoption of the developed system by end-users. Future studies could focus on evaluating user adoption and satisfaction with the developed system.
- 5. Limited scalability: The study did not consider the scalability of the developed system to handle larger amounts of data and user traffic. Future studies could focus on addressing this limitation to ensure the system's sustainability.

Overall, the study provides valuable insights into the design and development of a gym management system, but there are several limitations that need to be addressed in future studies to ensure the system's effectiveness and sustainability.

Future:

The paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohamed F. Tolba suggests several avenues for future research and development in the area of gym management systems. These include:

- Incorporation of Artificial Intelligence (AI): The authors suggest that the
 integration of AI and machine learning algorithms can personalize the user
 experience, enhance recommendations, and optimize the gym's operations.
 Future studies could explore the feasibility and effectiveness of incorporating AI
 into gym management systems.
- 2. Integration of mobile applications and wearables: The authors only focused on web-based gym management systems, ignoring mobile applications and wearables. Future studies could consider integrating these technologies into the system to improve accessibility and convenience.
- 3. Testing user adoption: The study did not evaluate the adoption of the developed system by end-users. Future studies could focus on testing user adoption and satisfaction to identify areas for improvement.

- 4. Addressing scalability: The study did not consider the scalability of the developed system to handle larger amounts of data and user traffic. Future studies could focus on addressing this limitation to ensure the system's sustainability.
- 5. Integration with third-party systems: Future studies could explore the integration of gym management systems with third-party systems, such as social media and health monitoring systems, to provide a more comprehensive experience for users.

METHODOLOGY

Here is a design for controlling online databases and transactions. Information is kept about the staff, members, facilities, and workouts. This system provides data storage and reporting based on a graphical user interface. The time required by the current system will be decreased by the project gym management system. All records in the prior system were on paper, thus if one piece of paper was lost, all of the records would also be destroyed.

Types of Research methodology:

- → Quantitative Research
- → Qualitative Research
- → Descriptive Research
- → Analytical Research
- → Applied Research
- → Fundamental Research
- → Exploratory Research
- → Conclusive Research
- → Surveys and Case Studies

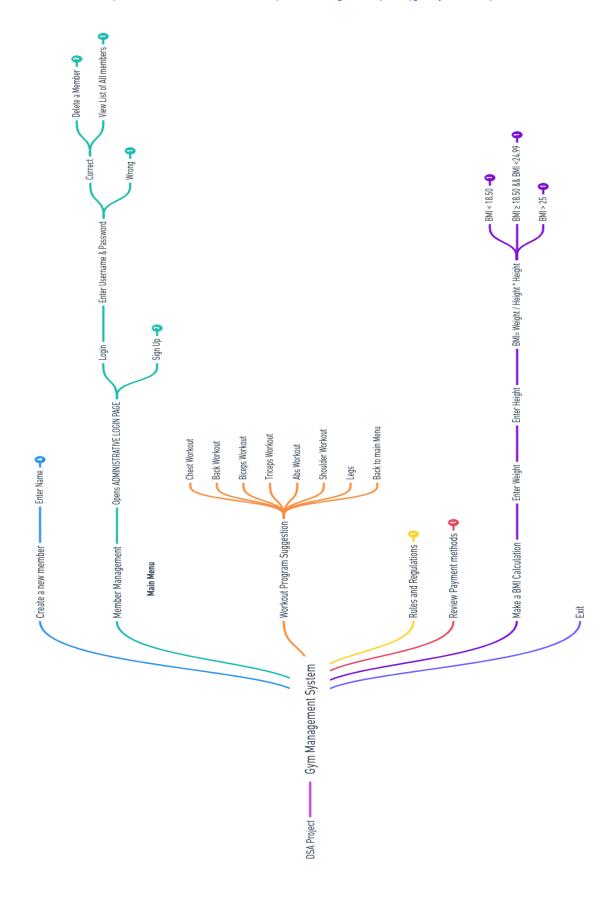
Although no particular school of thought was applied to this particular research paper the outcomes have been broad based on analytical and quantitative methodology.

Identify problem and motivate -> Define objectives of solution -> Design and Development -> Demonstration -> Evaluation -> Communication.

- 1) **Gathering requirements:** Present gym management systems were assessed to learn about their needs and pain areas in order to gather requirements for the gym management system. In this stage, existing gym management systems were examined to determine their advantages and disadvantages.
- 2) **System analysis and design:** Based on the requirements acquired in the first phase, the writers created the code module, data model, and user interface at this stage. The choice of relevant technologies and tools for the system's development was also a part of this step.
- 3) **Implementation:** Using the chosen technologies and tools, the writers created the gym administration system. The system's functions, including member registration, attendance monitoring, exercise recommendation ,security systems, and data analytics, were coded during this phase.
- 4) **To find any faults or problems**, the writers tested the gym management system in a real-world situation . Performance, usability, and usefulness of the system were evaluated.

5) **Debugging**: Code was debugged and final modifications were applied to the code.

 $Flow \ Chart \\ \underline{\text{https://whimsical.com/examples-6CSgiGPHp3aqgRzyPsPYJp}}$



PSEUDO CODE

Class Member:

Method new_member():

Clear the screen

Prompt the user to enter the name, surname, and branch of the new member

Prompt the user to choose a payment method

Open the "MemberList.txt" file for appending

Write the name, surname, and branch to the file

Close the file

Wait for user input to return to the main menu

Method member_management():

Create an instance of the Credential class

Clear the screen

Repeat until the user chooses to return to the main menu:

Prompt the user to choose an action (login or sign-up)

If the user chooses to login:

Call the loginFunction() method of the Credential instance

If the user chooses to sign-up:

Call the signupFunction() method of the Credential instance

Class Gym:

Method workout():

Clear the screen

Print a message encouraging the user to work out

Wait for user input to select a workout

Clear the screen

Repeat until the user chooses to return to the main menu:

Prompt the user to select a pre-workout exercise or return to the main $\ensuremath{\mathsf{menu}}$

If the user selects a pre-workout exercise:

Print the recommended sets and reps for the selected exercise

Wait for user input to return to the workout list

Class Credential: Method payment methods(): Clear the screen Print payment methods and discounts Wait for user input to return to the main menu Method signupFunction(): Clear the screen Prompt the user to choose a username Prompt the user to choose a numeric password Clear the screen Print a message indicating the account is ready to use Wait for user input to return to the main menu Method loginFunction(): Clear the screen Prompt the user to enter their username Prompt the user to enter their numeric password If the entered username and password match the stored username and password: Print login successful message Clear the screen Repeat until the user chooses to return to the main menu: Prompt the user to choose an action (delete a member or view list of all members) If the user chooses to view the list of all members: Clear the screen Read and display the contents of the "MemberList.txt" file If the user chooses to delete a member: Prompt the user to enter the name of the member to delete Open the "MemberList.txt" file for reading Open the "NewMemberlist.txt" file for writing Repeat until the end of the file is reached: Read the name, surname, and branch from the file If the read name is not equal to the member to delete: Write the name, surname, and branch to the "NewMemberlist.txt" file Else, if the read name is equal to the member to delete: Print the details of the deleted member Close the "MemberList.txt" and "NewMemberlist.txt" files Open the "MemberList.txt" file for writing Open the "NewMemberlist.txt" file for reading Repeat until the end of the file is reached: Read the name, surname, and branch from the "NewMemberlist.txt" file Write the name, surname, and branch to the "MemberList.txt" file Close the "MemberList.txt" and "NewMemberlist.txt" files Else: Print wrong username or password message

```
Main:
    Create an

instance of the Member class
    Clear the screen
Repeat until the user chooses to exit:
    Prompt the user to choose an action (member management, payment methods, workout, or exit)
    If the user chooses member management:
        Call the member_management() method of the Member instance
    If the user chooses payment methods:
        Call the payment_methods() method of the Credential instance
    If the user chooses workout:
        Call the workout() method of the Gym instance
    If the user chooses exit:
        Exit the program
```

Conclusion

In summary, both gym owners and customers have benefited greatly from the introduction of an extensive management system for gyms. The solution has successfully improved efficiency, streamlined processes, and the general gym experience.

The gym administration system has the potential to considerably reduce the administrative strain on employees, allowing them to concentrate more on providing excellent service to members by automating duties like membership management, class scheduling, and payment processing in future .

Additionally, the technology has given users access to practical self-service options like individualized exercise regimens, and progress tracking. Members now find it simpler to interact with the gym thanks to these features, which have also inspired them to stick with their fitness objectives.

Business-wise, the system has produced insightful data analyses that have helped gym owners make defensible choices regarding their marketing campaigns, equipment purchases, and facility upgrades. This data-driven strategy has improved revenue generation, resource allocation, and profitability.

In conclusion, the gym management system has transformed how gyms run by giving both gym owners and members a seamless and customized experience. The technology has many advantages for the fitness business, including increased productivity, increased client happiness, and data-driven decision-making. In an increasingly cutthroat industry, gyms can

survive and provide outstanding fitness services by embracing technology and harnessing the potential of automation.

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 Nagaraju Bogiri.
- Ref.2: Design and Development of a Gym Management System by Shivam Gupta and Ravi Kumar Issued Jan 2020.
- Ref.3: The paper "Development of a Gym Management System" by Noha H. Abdel-Aziz and Mohhamad F. Tolba. Issued 2019.

Reference Table		
Research Sub Category-1	Research Sub Category-2	Research Sub Category-3
[1] - 2022		
	[2] - 2020	
		[3] - 2019

APPENDIX

```
#include <iostream>
#include <cstdlib>
#include <cstring>
#include <windows.h>
#include <conio.h>

using namespace std;
int main();
char username[200];
char password[200];
class Credential {
public:
```

```
void payment methods() {
        system("cls");
        cout <<
"\n=======\n";
        cout << "\n\n\t\tPAYMENT METHODS AND DISCOUNTS\n\n";</pre>
        cout << "\n\tOption A: Fitness / Normal Membership - 1 Month (5</pre>
days a week) - Rs 520";
        cout << "\n\tOption B: Fitness / Normal Membership - 1 Month (3</pre>
days a week) - Rs 1115";
       cout << "\n\tOption C: Fitness / Student Discount - 1 Month (3</pre>
days a week) - Rs 1110\n;
       cout << "\n\tOption D: Swimming / Normal Membership - 1 Month</pre>
(5 days a week) - Rs 1125";
        cout << "\n\tOption E: Swimming / Normal Membership - 1 Month</pre>
(3 days a week) - Rs 1120";
       cout << "\n\tOption F: Swimming / Student Discount - 1 Month (3</pre>
days a week) - Rs 1115\n";
        cout << "\n\tOption G: Fitness and Swimming / Normal Membership</pre>
- 1 Month (5 days a week) - Rs 1140";
        cout << "\n\tOption H: Fitness and Swimming / Normal Membership
- 1 Month (3 days a week) - Rs 1130";
       cout << "\n\tOption I: Fitness and Swimming / Student Discount</pre>
- 1 Month (3 days a week) - Rs 1120";
       cout <<
       cout << "Press any key to return to the main menu...\n";</pre>
        cin.ignore();
       cin.get();
        system("cls");
       main();
   void signupFunction() {
       system("cls");
        cout << "\nChoose an username : \n";</pre>
```

```
cin >> username;
        cout << "Choose a numeric password : \n";</pre>
        cin >> password;
        cout << "\n **Your account is ready to use. Please go back.**</pre>
\n";
        system("cls");
        main();
    }
    void loginFunction() {
        system("cls");
        char userName[200];
        char passWord[200];
    tekrar:
        cout << "\nPlease enter username: \t";</pre>
        cin >> userName;
        cout << "\nPlease enter numeric password : ";</pre>
        cin >> passWord;
        if (strcmp(username, userName) == 0 && strcmp(password,
passWord) == 0) {
            cout << "\n\nLogin successful. Press any key to</pre>
continue. \n";
            // Access granted ;
            cin.ignore();
            cin.get();
            x:
            system("cls");
            int secim2;
            cout <<
                   cout << "\n\n\t\tMEMBER MANAGEMENT";</pre>
            cout << "\n\n\tPlease select an option: ";</pre>
            cout << "\n\t1. Delete a member.";</pre>
```

```
cout << "\n\t2. View the list of all members.";</pre>
            cout <<
"\n\n=======
            cout << "\n\n\tENTER YOUR CHOICE:\t";</pre>
            cin >> secim2;
     if (secim2 == 2) //displaying members.txt on
screen************
       system("cls");
       FILE * dosya;
       char character;
       dosya = fopen("MemberList.txt", "r");
       if (dosya != NULL) {
         character = fgetc(dosya);
         while (character != EOF) {
           printf("%c", character);
           character = fgetc(dosya);
         }
        }
       else {
         printf("\nFile does not exist. Try Again.");
         goto x;
        }
        fclose(dosya);
       printf("\nPress any key to return to the main menu.");
       getch();
       system("cls");
       main();
      } else if (secim2 == 1)
       FILE * dosya;
       char isimler[30], soyisimler[30], branchs[30], options[10];
```

```
char mem[20], adrs[25], id[30];
        int ag, cono, count = 0;
        FILE * fp;
        dosya = fopen("Memberlist.txt", "r");
        fp = fopen("NewMemberlist.txt", "w");
       printf("\nEnter the name of member: \n");
        getchar();
        gets (mem) ;
       while (!feof(dosya)) {
          fscanf(dosya, "%s%s%s", & isimler, & soyisimler, & branchs);
          if (strcmp(isimler, mem) != 0) {
            fprintf(fp, "%s %s %s\n", isimler, soyisimler, branchs);
          } else if (strcmp(isimler, mem) == 0) {
            printf("\nDetails of the deleted member is:\n");
            printf("Name : %s\nSurname : %s\nBranch : %s\n", isimler,
soyisimler, branchs);
          } else {
           printf("\nPlease enter the correct details\n");
        }
        fclose(dosya);
        fclose(fp);
        dosya = fopen("Memberlist.txt", "w");
        fp = fopen("NewMemberlist.txt", "r");
       while (!feof(fp)) {
          fscanf(fp, "%s %s %s", & isimler, & soyisimler, & branchs);
          fprintf(dosya, "%s %s %s\n", isimler, soyisimler, branchs);
        fclose(fp);
       fclose(dosya);
      }
      getch();
      system("cls");
     main();
```

```
} else {
     printf("\n\nWrong username or password.\nPlease try again or sign
up.\n");
     goto tekrar;
   }
};
class Member {
 public:
   void new member() {
     system("cls");
     char isim[30], soyisim[30], branch[30], paymentMethod[10];
    printf("\nEnter Name: \t");
scanf("%s", isim);
printf("\nEnter Surname: ");
scanf("%s", soyisim);
printf("\nEnter Main Branch: ");
scanf("%s", branch);
printf("\n\nChoose a payment method: ");
\n");
printf("\n\n\t\tPAYMENT METHODS AND DISCOUNTS\n\n");
printf("\n\tA- Fitness / Normal Membership: 1 Month (5 days a week) -
2000Rs");
printf("\n\tB- Fitness / Normal Membership: 1 Month (3 days a week) -
1500Rs");
printf("\n\tC- Fitness / Student Discount: 1 Month (3 days a week) -
1000Rs\n");
```

```
printf("\n\tD- Swimming / Normal Membership: 1 Month (5 days a week) -
2500Rs");
printf("\n\tE- Swimming / Normal Membership: 1 Month (3 days a week) -
2000Rs");
printf("\n\tF- Swimming / Student Discount: 1 Month (3 days a week) -
1500Rs\n");
printf("\n\tG- Fitness and Swimming / Normal Membership: 1 Month (5
days a week) - 4000Rs");
printf("\n\tH- Fitness and Swimming / Normal Membership: 1 Month (3
days a week) - 3000Rs");
printf("\n\tI- Fitness and Swimming / Student Discount: 1 Month (3 days
a week) - 2000Rs");
== \langle n \rangle ;
printf("Enter the choice with Letter: \t");
     scanf("%s", paymentMethod);
     FILE * f;
     f = fopen("MemberList.txt", "a");
     fprintf(f, "%s %s %s\n", isim, soyisim, branch);
     fclose(f);
     printf("\nPress any key to return to the main menu.");
     getch();
     system("cls");
     main();
   }
 void member management() {
   Credential credential;
   system("cls");
   int secim;
```

```
printf("\n=======
\n");
    printf("\n\n\t\tADMINISTRATIVE LOGIN PAGE");
    printf("\n\n\t1.Login to system with username and password.");
    printf("\n\t2.Sign-up to system.");
printf("\n\n========
==\n\n");
    printf("\n\n\tENTER YOUR CHOICE:\t");
    scanf("%d", & secim);
    switch (secim) {
    case 1:
      credential.loginFunction();
     break;
    case 2:
      credential.signupFunction();
      break;
    default:
      printf("\nWrong choice. Please try again.\n");
     break;
    }
  }
};
class Gym {
```

```
public:
   void workout() {
     int c, u;
     system("cls");
     printf("\n\n\n\n");
     printf("\t ** BE THE BEAST AND WORK HARD ***\n\n\n");
     printf("\t ** ALWAYS HEALTH COMES FIRST ***\n\n\n");
     printf("\t ** PRESS ANY KEY TO SELECT THE WORK OUT ***\n\n\n");
     getch();
     system("cls");
     z:
       printf("\n\n\n\n\n\n");
     printf("\tPRE-WORKOUT EXERCISE ARE COMPLUSORY\n\n\n");
     printf("\t1 : CHEST WORKOUT\n\n");
     printf("\t2 : BACK WORKOUT\n\n");
     printf("\t3 : BICEPS WORKOUT\n\n");
     printf("\t4 : TRICEPS WORKOUT\n\n");
     printf("\t5 : ABS WORKOUT\n\n");
     printf("\t6 : SHOULDER WORKOUT\n\n");
     printf("\t7 : LEGS\n\n");
     printf("\t8 : BACK TO MAIN MENU\n\n");
     printf("\t");
     scanf("%d", & c);
     system("cls");
     switch (c) {
     case 1:
       printf("\n");
       printf("\t PUSH UP:
                                           3 SETS;
                                                        15,12,10
REPS\n\n");
       printf("\t INCLINED BENCH-PRESS: 3 SETS;
                                                        15,12,10
REPS\n\n");
       printf("\t FLAT BENCH-PRESS:
                                           3 SETS;
                                                         15,12,10
REPS\n\n");
```

```
printf("\t DECLINED BENCH-PRESS: 3 SETS;
                                                      15,12,10
REPS\n\n");
       printf("\t INCLIDE DUMBBELL-PRESS: 3 SETS;
                                                      15,12,10
REPS\n\n");
       printf("\t FLAT DUMBELL-PRESS: 3 SETS;
                                                      15,12,10
REPS\n\n");
       printf("\t DECLINED DUMBELL-PRESS: 3 SETS;
                                                      15,12,10
REPS\n\n");
       printf("\t CABLE CROSS:
                                         3 SETS;
                                                      15,12,10
REPS\n\n'');
       printf("\t SEATED MACHINE FLY: 3 SETS;
                                                      15,12,10
REPS\n\n");
       printf("\t PLEASE DONT LIFT OVER-WEIGHT\n\n\n\n\n");
       printf("\t TO RETURN TO WORKOUT LIST PLEASE PRESS '2' ");
       scanf("%d", & u);
       if (u == 2) {
        system("cls");
         goto z;
       } else
         break;
     case 2:
       std::cout << "\n";
   std::cout << "\t WIDE GRIP PULL-UP: 3 SETS; 15,12,10
REPS\n\n";
   std::cout << "\t LAT PULL DOWN BACK: 3 SETS;
                                                        15,12,10
REPS\n\n";
   std::cout << "\t T-BAR ROW:</pre>
                                           3 SETS;
                                                         15,12,10
REPS\n\n";
   std::cout << "\t SEATED ROW:</pre>
                                           3 SETS;
                                                         15,12,10
REPS\n\n";
   std::cout << "\t PULL DOWN ROW:
                                           3 SETS;
                                                         15,12,10
REPS\n\n";
   std::cout << "\t ONE ARM DUMBBELL ROWS: 3 SETS;</pre>
                                                         15,12,10
REPS\n\n";
   std::cout << "\t BARBELL BENT OVER ROW: 3 SETS;</pre>
                                                         15,12,10
REPS\n\n";
```

```
3 SETS; 15,12,10
std::cout << "\t DEADLIFT:</pre>
REPS\n\n";
   std::cout << "\t PLEASE USE APPROPRIATE WEIGHTS\n\n";</pre>
   std::cout << "\t TO RETURN TO THE WORKOUT LIST, PLEASE PRESS '2' ";
       scanf("%d", & u);
       if (u == 2) {
        system("cls");
         goto z;
       } else
         break;
     case 3:
       std::cout << "\n";</pre>
   std::cout << "\t WIDE GRIP PULL-UP: 3 SETS; 15,12,10
REPS\n\n";
   std::cout << "\t PREACHER CURLS: 3 SETS;
                                                           15,12,10
REPS\n\n";
   std::cout << "\t BARBELL CURLS:</pre>
                                            3 SETS;
                                                         15,12,10
REPS\n\n";
   std::cout << "\t ALTERNATING DUMBBELL CURLS:3 SETS;</pre>
                                                           15,12,10
REPS\n\n";
   std::cout << "\t CONCENTRATION CURLS: 3 SETS;</pre>
                                                           15,12,10
REPS\n\n";
   std::cout << "\t CABLE BICEP CURLS: 3 SETS; 15,12,10
REPS\n\n";
   std::cout << "\t INCLINE DUMBBELL CURLS: 3 SETS; 15,12,10
REPS\n\n";
   std::cout << "\t REVERSE CURLS:</pre>
                                            3 SETS;
                                                          15,12,10
REPS\n\n";
   std::cout << "\t HAMMER CURLS:
                                            3 SETS;
                                                         15,12,10
REPS\n\n";
   std::cout << "\t PLEASE USE APPROPRIATE WEIGHTS\n\n";</pre>
   std::cout << "\t TO RETURN TO THE WORKOUT LIST, PLEASE PRESS '2' ";
       scanf("%d", & u);
       if (u == 2) {
        system("cls");
         goto z;
       } else
```

```
break;
      case 4:
      std::cout << "\n";</pre>
    std::cout << "\t TRICEPS DIPS:</pre>
                                                       3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t CLOSE-GRIP BENCH PRESS:</pre>
                                                      3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t SKULL CRUSHERS:</pre>
                                                      3 SETS:
15,12,10 REPS\n\n";
    std::cout << "\t OVERHEAD DUMBBELL EXTENSION: 3 SETS;</pre>
15,12,10 REPS\n\n";
    std::cout << "\t CABLE ROPE PUSH-DOWN: 3 SETS;</pre>
15,12,10 REPS\n\n";
    std::cout << "\t REVERSE GRIP TRICEPS PUSH-DOWN:3 SETS;</pre>
15,12,10 REPS\n\n";
    std::cout << "\t TRICEPS KICKBACK:</pre>
                                                       3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t DIAMOND PUSH-UP:</pre>
                                                      3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t TRICEPS CABLE PUSHDOWN: 3 SETS;</pre>
15,12,10 REPS\n\n";
    std::cout << "\t PLEASE USE APPROPRIATE WEIGHTS\n\n";</pre>
    std::cout << "\t TO RETURN TO THE WORKOUT LIST, PLEASE PRESS '2' ";
        scanf("%d", & u);
        if (u == 2) {
          system("cls");
          goto z;
        } else
          break;
      case 5:
        std::cout << "\n";
    std::cout << "\t HANGING LEG RAISE:</pre>
                                                                        3
SETS; 15,12,10 \text{ REPS} n ";
    std::cout << "\t MACHINE CRUNCH:</pre>
                                                                        3
SETS; 15,12,10 \text{ REPS} n ";
```

```
std::cout << "\t CABLE PALLOF PRESS:</pre>
                                                                       3
SETS;
          15,12,10 REPS\n\n";
   std::cout << "\t KNEELING CABLE CRUNCH:</pre>
                                                                       3
         15,12,10 REPS\n\n";
    std::cout << "\t DECLINE-BENCH CRUNCH WITH MEDICINE BALL:
                                                                       3
SETS:
          15,12,10 REPS\n\n";
    std::cout << "\t EXERCISE BALL PIKE:</pre>
                                                                       3
SETS; 15,12,10 \text{ REPS} n ";
    std::cout << "\t PLANK:</pre>
7,5,3 MINUTES\n\n";
    std::cout << "\t PLEASE AVOID LIFTING EXCESSIVE WEIGHT\n\n";</pre>
    std::cout << "\t TO RETURN TO THE WORKOUT LIST, PLEASE PRESS '2' ";
        scanf("%d", & u);
        if (u == 2) {
          system("cls");
          goto z;
        } else
          break;
      case 6:
        std::cout << "\n";</pre>
    std::cout << "\t DUMBBELL BENCH PRESS: 4 SETS;</pre>
12,10,8,8 REPS\n\n";
    std::cout << "\t INCLINE DUMBBELL PRESS: 3 SETS;</pre>
                                                                10,8,8
REPS\n\n";
    std::cout << "\t DUMBBELL FLYES:</pre>
                                                    3 SETS;
                                                                 10,10,10
REPS\n\n";
    std::cout << "\t CABLE CROSSOVERS:</pre>
                                                    3 SETS;
                                                                 12,12,12
REPS\n\n";
    std::cout << "\t TRICEPS DIPS:</pre>
                                                    3 SETS;
                                                                 12,10,10
REPS\n\n";
    std::cout << "\t TRICEPS PUSHDOWNS:</pre>
                                                    3 SETS;
                                                                 12,12,10
REPS\n\n";
    std::cout << "\t OVERHEAD TRICEPS EXTENSIONS: 3 SETS; 10,10,8
REPS\n\n";
    std::cout << "\t PLEASE AVOID LIFTING EXCESSIVE WEIGHT\n\n";</pre>
    std::cout << "\t TO RETURN TO THE WORKOUT LIST, PLEASE PRESS '2' ";
       scanf("%d", & u);
```

```
if (u == 2) {
          system("cls");
          goto z;
        } else
         break;
     case 7:
       std::cout << "\n";
    std::cout << "\t SET-UPS:</pre>
                                                   3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t SUMO DUMBBELL SQUATS:
                                                   3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t LUNGES WITH DUMBBELLS:</pre>
                                                   3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t SEATED LEG CURLS:</pre>
                                                   3 SETS:
15,12,10 REPS\n\n";
    std::cout << "\t SEATED MACHINE EXTENSIONS: 3 SETS;</pre>
15,12,10 REPS\n\n";
    std::cout << "\t STANDING DUMBBELL CALF RAISES: 3 SETS;</pre>
15,12,10 REPS\n\n";
    std::cout << "\t REVERSE LEG CURLS:</pre>
                                                   3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t HEAVY LEG PRESS:
                                                   3 SETS;
15,12,10 REPS\n\n";
    std::cout << "\t PLEASE AVOID LIFTING EXCESSIVE WEIGHT\n\n";</pre>
    std::cout << "\t TO RETURN TO THE WORKOUT LIST, PLEASE PRESS '2' ";
        scanf("%d", & u);
       if (u == 2) {
          system("cls");
         goto z;
        } else
         break;
      case 8:
       main();
       break;
```

```
void rules() {
    system("cls");
   std::cout <<
"\t\t=======
    std::cout << "\n\t\t</pre>
                                         RULES AND REGULATIONS
\n";
    std::cout <<
"\t\t========\n";
    std::cout << "\n\t1. Do not bring your gym bag or other personal
belongings onto the fitness floor. \n";
    std::cout << "\t2. Refrain from yelling, using profanity, banging
weights, and making loud sounds. \n";
    std::cout << "\t3. Do not occupy machines between sets.\n";
    std::cout << "\t4. Please re-rack weights and return all other
equipment and accessories to their designated places. \n";
    std::cout << "\t5. Ask the staff for assistance in operating
equipment to avoid delays for others. \n";
    std::cout << "\t6. After use, make sure to wipe down all
equipment.\n";
    std::cout << "\t7. Adhere to the posted time limits on all
cardiovascular machines.\n";
    std::cout << "\t8. Children are not allowed on the gym floor.
Please keep them in the designated childcare area. \n";
    std::cout << "\t9. Respect others' workouts and maintain a focused
environment.\n";
    std::cout << "\t10. Before starting your workout, please wash your
hands and refrain from using heavy scents.\n\n";
    std::cout << "\n\tPRESS ANY KEY TO RETURN TO THE MAIN MENU\n";
    getch();
   system("cls");
   main();
  }
```

```
void bmi calculation() {
   system("cls");
   float height, weight, bmi = 0;
   int age;
   printf("\nPlease enter weight (kg): \n");
    scanf("%f", & weight);
   printf("Please enter height (dot m): \n");
    scanf("%f", & height);
   bmi = weight / (height * height);
   if (bmi < 18.50) {</pre>
      printf("\n\nYou are below your ideal weight.\n\n");
     printf("The result is : %.2f\n\n", bmi);
    } else if (bmi >= 18.50 && bmi < 24.99) {</pre>
     printf("\n\nYour weight is ideal.\n\n");
     printf("The result is : %.2f\n\n", bmi);
    } else if (bmi > 25) {
      printf("\n\nYou are above your ideal weight.\n\n");
     printf("The result is : %.2f\n\n", bmi);
    }
   printf("Press any key to return to the main menu.\n");
   getch();
   system("cls");
   main();
 }
};
class MainMenu {
 Member member;
 Credential credential;
```

```
Gym gym;
 public:
   void mainMenu(void) {
     system("COLOR 1F");
     int rakam;
    std::cout <<
"\n=========\n";
       std::cout << "\n\n\t\tWELCOME TO GYM MANAGEMENT SOFTWARE";</pre>
       std::cout << "\n\n\t1. CREATE A NEW MEMBER";</pre>
       std::cout << "\n\t2. MEMBER MANAGEMENT (requires admin login)";
       std::cout << "\n\t3. WORKOUT PROGRAM SUGGESTION";</pre>
       std::cout << "\n\t4. RULES AND REGULATIONS";</pre>
       std::cout << "\n\t5. REVIEW PAYMENT METHODS & DISCOUNTS";</pre>
       std::cout << "\n\t6. MAKE A BMI CALCULATION";</pre>
       std::cout << "\n\t7. EXIT";</pre>
       std::cout <<
"\n\n=======\n\n"
       std::cout << "\n\n\tENTER YOUR CHOICE:\t";</pre>
     scanf("%d", & rakam);
     switch (rakam) {
     case 1:
       member.new member();
       break;
     case 2:
       member.member management();
       break:
     case 3:
       gym.workout();
       break;
     case 4:
```

```
gym.rules();
       break;
     case 5:
       credential.payment_methods();
       break;
     case 6:
       gym.bmi calculation();
      break;
     case 7:
       printf("\n\n\tTHANK YOU\n");
       exit(0);
      break;
     default:
       printf("\nWrong choice. Please enter the correct numbers to use
program.\n");
      break;
    }
};
//-----MAIN-----
int main() {
 MainMenu mainMenu;
 mainMenu.mainMenu();
```