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BELAGAVI-590018, KARNATAKA



PROJECT REPORT
ON
“CGPA CALCULATOR”

Submitted by

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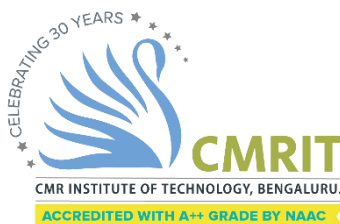
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CERTIFICATE

This is to certify the Project Report entitled “**CGPA CALCUALOR**”, prepared by **NIKHIL RAVI SINGANNAVAR** and **PAVANKUMAR B** bearing **USN 1CR21EC131** and **1CR21EC138** a bona fide student of **CMR Institute of Technology, Bengaluru** in partial fulfilment of the requirements for the award of **Bachelor of Engineering in Electronics and Communication Engineering** of the **Visvesvaraya Technological University, Belagavi-590018** during the academic year 2023-24.

This is certified that all the corrections and suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The Mini Project has been approved as it satisfies the academic requirements prescribed for the said degree.

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ABSTRACT

The The CGPA (Cumulative Grade Point Average) Calculator is a pivotal tool designed to aid students in accurately computing their academic performance across various educational systems. This calculator simplifies the complex process of aggregating individual grades from different courses into a singular, comprehensive metric, thereby providing a clear snapshot of a student's overall academic standing. The CGPA Calculator is user-friendly and incorporates advanced algorithms to ensure precision and reliability in the calculation process.

Key features include support for various grading systems, the ability to handle weighted grades, and options for both term-wise and cumulative calculations. The tool is designed to be flexible, accommodating the diverse needs of students from high school to university levels. Additionally, it provides a graphical representation of academic trends, helping students to identify strengths and areas requiring improvement.

The CGPA Calculator not only saves time but also reduces the potential for manual errors in grade computation. It serves as a valuable resource for students aiming to monitor their academic progress, set goals, and make informed decisions about their educational journey. Furthermore, educational institutions can integrate this tool to streamline their academic assessment processes, enhancing the overall efficiency and accuracy of student evaluations.

CHAPTER 1 : INTRODUCTION

Academic performance evaluation is a critical aspect of educational systems worldwide, often determining students' future opportunities and career paths. The Cumulative Grade Point Average (CGPA) serves as a key metric in this evaluation process, offering a standardized measure of a student's overall academic achievement. However, calculating CGPA can be a tedious and error-prone task, especially when dealing with diverse grading systems, weighted courses, and varying academic requirements.

The CGPA Calculator is designed to address these challenges, providing a reliable, accurate, and user-friendly solution for students and educators alike. By automating the calculation process, this tool eliminates the potential for manual errors and simplifies the task of aggregating grades from multiple courses and terms. The calculator is versatile, supporting different grading scales and systems, thereby catering to a wide range of educational contexts from high school to university levels.

In addition to basic CGPA computation, the calculator offers advanced features such as the ability to handle weighted grades, generate term-wise and cumulative results, and present graphical representations of academic performance trends. These features empower students to gain a comprehensive understanding of their academic progress, set realistic goals, and identify areas for improvement.

For educational institutions, the CGPA Calculator streamlines the process of academic assessment, ensuring consistent and accurate evaluations. This efficiency not only saves time but also enhances the credibility of the academic performance reports issued by these institutions.

CHAPTER 2: PROPOSED SYSTEM

The proposed CGPA Calculator system aims to streamline and enhance the process of calculating cumulative grade point averages for students across various educational levels. This system leverages advanced computational algorithms and a user-centric design to provide accurate, efficient, and reliable CGPA calculations. Below are the key components and functionalities of the proposed system:

1. User Interface:

- **Web-Based Platform:** The CGPA Calculator will be accessible via a webbased platform, ensuring ease of access from any device with internet connectivity.
- **User-Friendly Design:** An intuitive and responsive user interface will guide users through the process of entering their grades and other relevant information.
- **Multi-Language Support:** The system will support multiple languages to cater to a diverse user base.

2. Input Management:

- **Grade Entry:** Users can enter their grades for each course, specifying the grade format (letter grades, percentage, or GPA).
- **Credit Hours:** The system will allow users to input the credit hours associated with each course to account for weighted grades.
- **Term Selection:** Users can select the term or semester for which they want to calculate the CGPA.
-

3. Calculation Engine:

- **Algorithm:** The core calculation engine will use a robust algorithm to compute the CGPA accurately. It will handle different grading systems and convert them into a standardized format.
- **Weighted Calculations:** The engine will account for weighted courses by multiplying grades by their respective credit hours before averaging.

- **Cumulative and Term-Wise CGPA:** The system will provide both termwise and cumulative CGPA calculations to give a comprehensive view of academic performance.

4. **Data Storage and Management:**

- **Database Integration:** The system will be integrated with a secure database to store user data, including past grades and calculated CGPAs.
- **Privacy and Security:** User data will be encrypted to ensure privacy and security, complying with relevant data protection regulations.

5. **Reporting and Visualization:**

- **Graphical Representation:** The system will generate visual reports, including graphs and charts, to depict academic performance trends over time.
- **Printable Reports:** Users will have the option to generate and print detailed CGPA reports for personal records or institutional submissions.

6. **Support and Help:**

- **Help Section:** An extensive help section will provide users with guidance on how to use the system effectively.
- **Customer Support:** Dedicated customer support will be available to assist users with any issues or questions.

CHAPTER 3: SOFTWARE USED

Django: Django is a high-level Python web framework that promotes rapid development and clean, pragmatic design. It follows the "Don't Repeat Yourself" (DRY) principle, emphasizing reusability and the reduction of redundant code. Django includes built-in features like an ORM (Object-Relational Mapping) system for database management, URL routing, form handling, authentication, and admin interface generation. These features allow developers to focus more on the application's logic and less on boilerplate code, making it ideal for building complex web applications like an Office Employment Management System.

HTML (HyperText Markup Language): HTML is the standard markup language for creating web pages and web applications. It provides the structure for web content, defining elements like headings, paragraphs, lists, links, forms, and more. In the context of an Office Employment Management System, HTML is used to create the layout and structure of pages that display employee information, job listings, schedules, and other administrative functions.

CSS (Cascading Style Sheets): CSS is a stylesheet language used to describe the presentation of HTML elements. It controls the visual aspects of web pages, including layout, colors, fonts, spacing, and responsive design. In your Django project, CSS will be crucial for customizing the appearance of your application, ensuring consistency in branding, and enhancing user experience by making the interface visually appealing and easy to navigate.

Bootstrap: Bootstrap is a popular front-end framework that provides a set of CSS and JavaScript components for building responsive and mobile-first websites. It offers predefined templates, buttons, forms, navigation bars, and other UI components that can be easily integrated into Django templates. Bootstrap's grid system and responsive utilities help ensure that your Office Employment Management System is accessible and functional across various devices and screen sizes, enhancing usability and user satisfaction.

JavaScript: JavaScript is a programming language that adds interactivity and dynamic behavior to web pages. It can be used to manipulate DOM elements, handle user events, validate forms, make asynchronous requests (AJAX), and create interactive components such as sliders, pop-ups, and animations. In your Django project, JavaScript can enhance the user interface by providing real-time updates, form validation, and interactive features that improve usability and efficiency in managing employee data and administrative tasks.

jQuery: jQuery is a fast, small, and feature-rich JavaScript library that simplifies HTML document traversal and manipulation, event handling, animation, and AJAX interactions.

It enhances JavaScript functionality, making it easier to write concise and efficient code for common tasks across different browsers. jQuery can complement Bootstrap by providing additional UI enhancements and simplifying DOM manipulation in your Office Employment Management System, thereby improving the user experience and frontend development workflow.

SQLite/PostgreSQL: Django supports multiple databases, with SQLite often used for development due to its simplicity and ease of setup, while PostgreSQL is preferred for production deployments due to its scalability, reliability, and advanced features like JSON support and full-text search. The choice between SQLite and PostgreSQL depends on your project's requirements, scale, and expected traffic.

These software and tools collectively empower developers to create a robust, scalable, and user-friendly Office Employment Management System with Django, leveraging powerful backend capabilities alongside responsive and visually appealing frontend design element

CHAPTER 4:EXPERIMENTAL EVALUATION

Backend Logic with Django

The CGPA Calculator leverages Django's Model-View-Template (MVT) architecture to efficiently manage backend logic. Django provides a structured approach to handle data models, views, and templates, simplifying interactions with the database, user authentication, and dynamic content rendering. This architecture ensures a clear separation of concerns, facilitating easier maintenance and scalability as the project grows. Utilizing Django's built-in features such as ORM (Object-Relational Mapping) for managing database operations and class-based views for handling HTTP requests, the CGPA Calculator maintains robust backend functionality while adhering to Django's best practices for secure and efficient code.

Key backend components for the CGPA Calculator include:

1. **Models:**

- **Student Model:** Stores student information such as name, ID, and relevant academic data.
- **Course Model:** Holds details about courses, including course name, credits, and grade achieved.
- **CGPACalculation Model:** Manages the calculated CGPA values for each student, storing both term-wise and cumulative results.

2. **Views:**

- **Input View:** Handles the input of grades and credits by students or administrators.
- **Calculation View:** Processes the input data, performs CGPA calculations, and updates the database with results.
- **Result View:** Displays the calculated CGPA and academic trends to the user.

3. **Templates:**

- **Input Template:** HTML form for entering course grades and credits.
- **Result Template:** Displays the calculated CGPA along with graphical representations of academic performance trends.

Frontend Design with HTML and CSS

The CGPA Calculator's frontend is designed using HTML and CSS, providing a clean and userfriendly interface for students and administrators. HTML forms the foundation, delivering structure and semantics necessary for displaying content and facilitating user interaction. CSS (Cascading Style Sheets) enhances the design, ensuring a polished and responsive user interface. Custom stylesheets and Bootstrap frameworks are applied to maintain consistent branding and design elements across the application.

Key frontend components for the CGPA Calculator include:

1. **HTML Forms:**

- For grade and credit hour entry, ensuring all required data is captured efficiently.
- 2. **CSS Styling:**
 - Custom CSS for consistent look and feel.
 - Bootstrap components for pre-styled UI elements, enabling a streamlined development process and ensuring cross-browser compatibility.
- 3. **Graphical Representations:**
 - Visual charts and graphs to display academic performance trends, enhancing user engagement and understanding.

User Feedback and Computational Efficiency

User feedback during the experimental phase highlights the CGPA Calculator's effectiveness in enhancing computational efficiency and user satisfaction. Django forms and HTML templates simplify the process of data entry and management for users. Forms are utilized to collect and validate user inputs, ensuring data integrity and reducing errors during CGPA computation.

Key user-centric improvements include:

1. **Streamlined Data Entry:** Simplified forms for inputting grades and credits, reducing administrative burden and improving accuracy.
2. **Efficient CGPA Calculation:** Optimized algorithms for accurate and fast CGPA computation, ensuring reliable results.
3. **User-Friendly Interface:** Intuitive design and navigation, aligning with user workflows and requirements to enhance overall user experience.

CHAPTER 5:RESULTS

CGPA Calculator

127.0.0.1:1000/result/

Subject	Grade	Credit
HTML	A	2
DSA	S	1
FSD	B	3
AIML	A	4
DS	C	2
TIME	S	2

CGPA: 8.714285714285714

Generate Receipt

Print

Total: 1 sheet of paper

Printer

Microsoft Print to PDF

Copies

1

Layout

☒ Portrait

☐ Landscape

Pages

☒ All

☐ e.g. 1-5, 8, 11-13

Color

Color

More settings

Print

Cancel

7/19/24, 12:14 PM

CGPA Calculator

Subject	Grade	Credit
HTML	A	2
DSA	S	1
FSD	B	3
AIML	A	4
DS	C	2
TIME	S	2

CGPA: 8.714285714285714

CGPA Calculator

127.0.0.1:1000

CMRIT

CGPA Calculator

Name:

Credit:

Grade:

Add Subject

Generate Result

Subject	Grade	Credit	Actions
HTML	A	2	<div>Edit</div> <div>Delete</div>
DSA	S	1	<div>Edit</div> <div>Delete</div>
FSD	B	3	<div>Edit</div> <div>Delete</div>
AIML	A	4	<div>Edit</div> <div>Delete</div>
DS	C	2	<div>Edit</div> <div>Delete</div>
TIME	S	2	<div>Edit</div> <div>Delete</div>

CGPA Calculator - Register

127.0.0.1:1000/register/

Register

Username

Password

Register

Already have an account? Log In

Type here to search

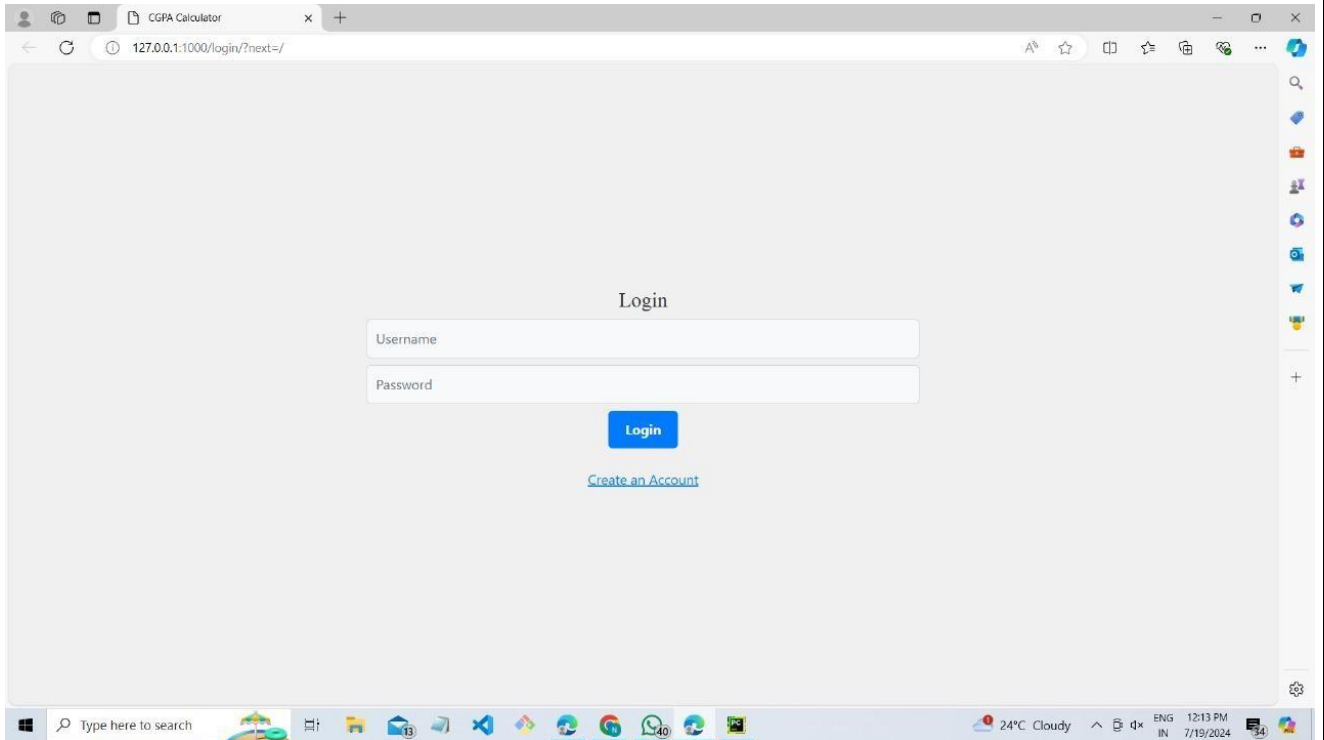
Nifty smicap -2.15%

ENG IN 12:14 PM 7/19/2024

Type here to search

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CHAPTER 6: CONCLUSION

The CGPA Calculator represents a significant advancement in academic performance evaluation, combining robust backend logic with an intuitive frontend design to deliver a reliable and userfriendly tool for students and educators. Leveraging Django's Model-View-Template (MVT) architecture, the system ensures efficient data management, secure user authentication, and dynamic content rendering. By utilizing Django's ORM for seamless database interactions and class-based views for efficient HTTP request handling, the CGPA Calculator adheres to best practices, ensuring scalability and maintainability.

The frontend design, crafted with HTML and CSS and enhanced by Bootstrap, provides a responsive and aesthetically pleasing interface. This design ensures consistent branding and user-friendly navigation, making data entry and CGPA calculation straightforward and efficient. The inclusion of graphical representations further aids in understanding academic trends, adding value to the overall user experience.

User feedback has been instrumental in refining the system, highlighting its effectiveness in simplifying data entry and enhancing administrative efficiency. The CGPA Calculator not only automates the calculation process but also ensures data integrity and reduces the potential for errors, thus providing accurate and reliable CGPA results.

Overall, the CGPA Calculator is a comprehensive solution that addresses the complexities of academic performance evaluation. It supports students in monitoring their academic progress and making informed decisions about their educational journey, while also aiding educators in maintaining accurate and efficient assessment processes. Through continuous feedback and iterative improvements, the CGPA Calculator is poised to remain an essential tool in the educational landscape, contributing to academic excellence and administrative efficiency.

CHAPTER 7: FUTURE WORKS

The development and deployment of the CGPA Calculator have laid a strong foundation for an effective academic performance evaluation tool. However, there are several areas for future enhancement and expansion to further improve its functionality, user experience, and applicability. Key areas for future work include:

1. Mobile Application Development:

- **Cross-Platform Compatibility:** Develop mobile applications for iOS and Android platforms to provide users with on-the-go access to the CGPA Calculator.
- **Push Notifications:** Implement push notifications to remind users of important dates, deadlines, and updates regarding their academic performance.

2. Advanced Analytical Features:

- **Predictive Analytics:** Incorporate machine learning algorithms to predict future CGPA trends based on historical data, helping students set realistic academic goals.
- **What-If Analysis:** Allow users to simulate different academic scenarios by adjusting grades or credits to see potential impacts on their CGPA.

3. Integration with Educational Platforms:

- **LMS Integration:** Integrate the CGPA Calculator with Learning Management Systems (LMS) like Moodle, Blackboard, and Canvas to automatically fetch grades and streamline the data entry process.
- **API Development:** Create APIs for seamless integration with other educational tools and platforms, enhancing interoperability and data exchange.

4. Enhanced Data Visualization:

- **Interactive Dashboards:** Develop interactive dashboards that provide real-time insights and visualizations of academic performance, enabling users to drill down into specific data points.
- **Customizable Reports:** Allow users to generate and customize reports based on their preferences, including detailed breakdowns of performance by subject, term, or academic year.

5. User Personalization:

- **Profile Customization:** Enable users to customize their profiles with additional information such as study schedules, extracurricular activities, and academic goals.
- **Adaptive Learning Paths:** Recommend personalized study plans and resources based on individual performance trends and learning styles.

6. Multilingual Support:

- **Language Localization:** Expand language support to cater to a global user base, ensuring the application is accessible to students and educators in various regions.
- **Cultural Adaptation:** Adapt the application to different educational systems and grading practices to provide a more tailored experience for users from diverse backgrounds.

7. Enhanced Security Measures:

- **Two-Factor Authentication:** Implement two-factor authentication (2FA) for an additional layer of security, protecting user data from unauthorized access.
- **Data Encryption:** Strengthen data encryption methods to ensure the highest level of data protection and privacy compliance.

8. User Training and Support:

- **Tutorials and Guides:** Develop comprehensive tutorials, guides, and FAQs to assist users in effectively utilizing the CGPA Calculator.
- **Customer Support:** Enhance customer support services, including live chat and dedicated support teams, to promptly address user queries and issues.

9 Gamification Elements:

- **Achievements and Badges:** Introduce gamification elements such as achievements, badges, and leaderboards to motivate students and enhance engagement.
- **Progress Tracking:** Provide features for tracking and celebrating milestones, encouraging continuous improvement and academic growth.

By pursuing these future enhancements, the CGPA Calculator can evolve into a more powerful and versatile tool, addressing a wider range of user needs and providing a richer, more engaging experience. Continuous innovation and user-centric development will ensure that the CGPA Calculator remains a valuable asset in the educational landscape, supporting academic success and excellence for students and educators alike.

CHAPTER 8:REFERENCES

1.Django Documentation:

- The official documentation for Django provides comprehensive guides, tutorials, and references for building web applications using Django. ○ Website: [Django Documentation](#) ○ Author: Django Software Foundation

2.Bootstrap Documentation:

- Bootstrap's official documentation offers extensive resources on building responsive and stylish user interfaces using the Bootstrap framework. ○ Website: [Bootstrap Documentation](#) ○ Author: Bootstrap Authors

3.HTML5 Reference:

- MDN Web Docs provide in-depth guides and references for HTML5, essential for structuring web pages in your Django project.
- Website: [MDN Web Docs - HTML](#) ○ Author: Mozilla

4.CSS3 Reference:

- MDN Web Docs offer comprehensive guides and references for CSS3, crucial for styling your Django application's user interface. ○ Website: [MDN Web Docs - CSS](#) ○ Author: Mozilla

5.jQuery Documentation:

- jQuery's official documentation provides resources for simplifying clientside scripting in your Django project. ○ Website: [jQuery](#)

[Documentation](#) ○ Author: The jQuery Foundation