

CGPA Calculator

Enhancing Digital Government and Economy (EDGE)

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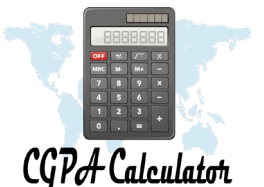
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Introduction

The CGPA (Cumulative Grade Point Average) calculator is a software tool designed to assist students and educational institutions in calculating and managing academic performance. This tool aims to provide a comprehensive solution for calculating CGPA, handling multiple subjects and semesters, and generating detailed reports in various formats such as Excel, PDF, JPG, and PNG. The project incorporates a user-friendly interface for data input and supports generating visual and tabular reports.



Features

1.Course Data Entry: The tool allows users to input subject details, including course credits and obtained marks.

2.Grade Calculation: It automatically determines the grade point based on the marks entered using predefined criteria.

3.CGPA Calculation: It calculates CGPA by taking the weighted average of the grade points and course credits.

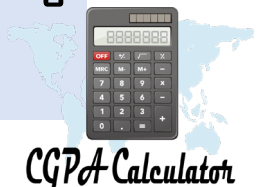
4.Report Generation:

1. **Excel Format:** Exports the result to an Excel file.

2. **PDF Format:** Converts the tabular data into a PDF report.

3. **JPG/PNG Image Formats:** Saves the results as images for easy sharing.

5.File Management: Automatically handles file naming to prevent overwriting, offering alternatives if files with the same name exist.

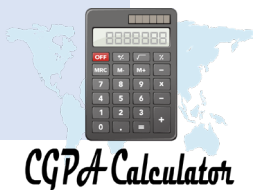


Implementation

The CGPA calculator is implemented using Python, with support from several libraries and modules:

Python Libraries:

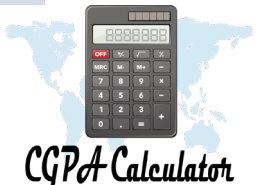
- **Pandas:** For data handling and manipulation.
- **OpenPyXL:** To read and write Excel files.
- **Matplotlib:** For creating visualizations and tables.
- **OS:** For file and path operations, such as checking if a file already exists.
- **Tabulate (if applicable):** If you're using tabular formats for better data presentation in terminal output.
- **PDF Creation Libraries:**
 - Custom libraries like **pdf_maker** (for converting data frames to PDF).
- **Image Conversion Libraries:**
 - Custom libraries like **jpg_maker** and **png_maker** (for converting data to JPG and PNG formats).



Implementation:

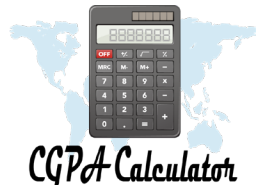
Modular Code: The project is divided into several files, each responsible for different functionalities:

- **others.py:** Contains the core functions for CGPA calculation, data input, and saving results in different formats.
- **dphysics.py:** A specialized module for handling data related to a physics course, focusing on semester-based evaluation.
- **pdf_maker.py:** Handles converting data frames into PDF format.
- **jpg_maker.py:** Converts tabular data to JPG images.
- **png_maker.py:** Converts tabular data to PNG images.



User Interaction:

- Prompts users for the number of courses, credits, and obtained marks.
- Offers options to save the result in multiple formats.
- Ensures user-friendly error handling with prompts for correct input if mistakes are made.



Reports

The software is capable of generating detailed reports in multiple formats:

1.Excel Report:

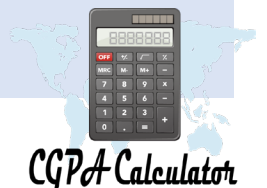
1. Presents a structured tabular format of course data, including subject names, credits, marks, grade points, and the overall CGPA.
2. Useful for in-depth data analysis.

2.PDF Report:

1. Provides a compact, portable report suitable for sharing or printing.
2. Maintains the table format of course data for easy readability.

3.Image Reports (JPG & PNG):

1. Saves the report as an image, making it accessible on any device without additional software.
2. Ideal for quick sharing via social media or messaging platforms.



Conclusion

The CGPA calculator project successfully provides a flexible and versatile solution for students and educational institutions. With its modular implementation, user-friendly interface, and capability to generate reports in multiple formats, it meets the diverse needs of academic performance analysis. This tool facilitates accurate CGPA calculation and efficient report management, ensuring a seamless experience for users.

