VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELGAUM-590014

A Mini project

On

CGPA Calculator using R Programming

A mini project report submitted in partial fulfilment of the requirements for the IV Semester degree of ***Bachelor of Engineering in Computer Science and Technology*** *of Visvesvaraya Technological University, Belgaum.*

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ABSTRACT

The CGPA (Cumulative Grade Point Average) calculator is a valuable tool for students and academic institutions to monitor and assess academic performance. In this project, we present the development of a CGPA calculator using the R programming language. R is a versatile and widely-used language for data analysis and manipulation, making it an excellent choice for creating such a tool.

The CGPA calculator in R takes into account various factors, including course credits and grades, to compute the cumulative GPA for a student. The user-friendly interface allows students to input their course marks, and the calculator performs the necessary calculations to provide an accurate CGPA.

The CGPA calculator in R is a versatile tool that can be easily adapted and customized to suit the specific needs of different academic institutions or individual users. It promotes transparency and clarity in academic performance assessment and empowers students to make informed decisions regarding their education.

This project highlights the flexibility and power of R programming in creating practical educational tools. It also serves as a foundation for future enhancements, such as the integration of additional features like forecasting CGPA trends or generating reports. Overall, the CGPA calculator in R contributes to improving the academic experience by providing a reliable and user-friendly tool for tracking and managing

INTRODUCTION

The Cumulative Grade Point Average (CGPA) is a fundamental metric in the education system that reflects a student's overall academic performance. It serves as a reliable indicator of a student's achievements throughout their educational journey, making it crucial for both students and educational institutions. To streamline the process of calculating and monitoring CGPA, we present the development of a CGPA calculator using the R programming language.

In the modern educational landscape, where data-driven decision-making is gaining prominence, tools that facilitate the computation of CGPA are invaluable. R, a versatile and widely-adopted programming language for data analysis, offers a robust platform for creating such a tool. By harnessing the power of R, we aim to provide students and educators with an efficient and user-friendly CGPA calculator.

Traditionally, calculating CGPA involves manually summing the product of course credits and corresponding grades, a task that can be time-consuming and error-prone. This calculator in R simplifies the process by automating these calculations, reducing the likelihood of errors, and providing students with instant access to their CGPA.

The development of this CGPA calculator in R leverages the language's capabilities for data manipulation, calculation, and visualization. It allows for the easy input of course details, including credits and grades, and then computes the CGPA using the appropriate formulas. Furthermore, R's data visualization capabilities enable the presentation of CGPA trends over time, offering students valuable insights into their academic progress.

In the following sections, we will delve into the technical aspects of the CGPA calculator's development in R, discussing data handling, manipulation, calculation, and potential enhancements. By the end, readers will have a comprehensive understanding of how R programming can be harnessed to create a valuable tool that simplifies CGPA calculations and enhances the overall educational experience.

PROGRAM CODE

```
print("!!!....Welcome to CGPA Calculator....!!!")
marksList<- list()
n = as.integer(readline("\nEnter the no of subjects: "))
cgpa = 0
tot = 0
totmarks = 0
for (i in 1: n)
{
  cat("\nEnter the marks of subject ",i," out of 100")
  marks = as.integer(readline())
  marksList<-append(marksList,marks)
  g<-as.integer(readline("\nEnter the grade for corresponding subject: "))
  if(marks>=90){
    cgpa = cgpa+10*g
  }
  else if(marks>=80 && marks<90){
    cgpa = cgpa+9*g
  }
  else if(marks>=70 && marks<80){
    cgpa = cgpa+8*g
```

```
  }
  else if(marks>=60 && marks<70){
    cgpa = cgpa+7*g
  }
  else if(marks>=50 && marks<60){
    cgpa = cgpa+6*g
  }
  else{
    cgpa = cgpa+5*g
  }
  tot = tot+g
  totmarks = totmarks+marks
}
cat("\nThe total marks obtained is: ",totmarks)
cat("\nTotal credits for all courses is: ",tot)
result = cgpa/tot
a = marksList[[1]]
b = marksList[[2]]
c = marksList[[3]]
d = marksList[[4]]
e = marksList[[5]]
mylabel <- c("Subject 1","Subject 2","Subject 3","Subject 4","Subject 5")
```

```
colors<-c("blue","yellow","green","red","brown")

x <- c(a,b,c,d,e)

pie(x,labels = mylabel,main = "CGPA",col = colors)

legend("bottomright",mylabel,fill = colors)

cat("\nThe Overall CGPA of this SEM is ",result)
```

FLOWCHARTS

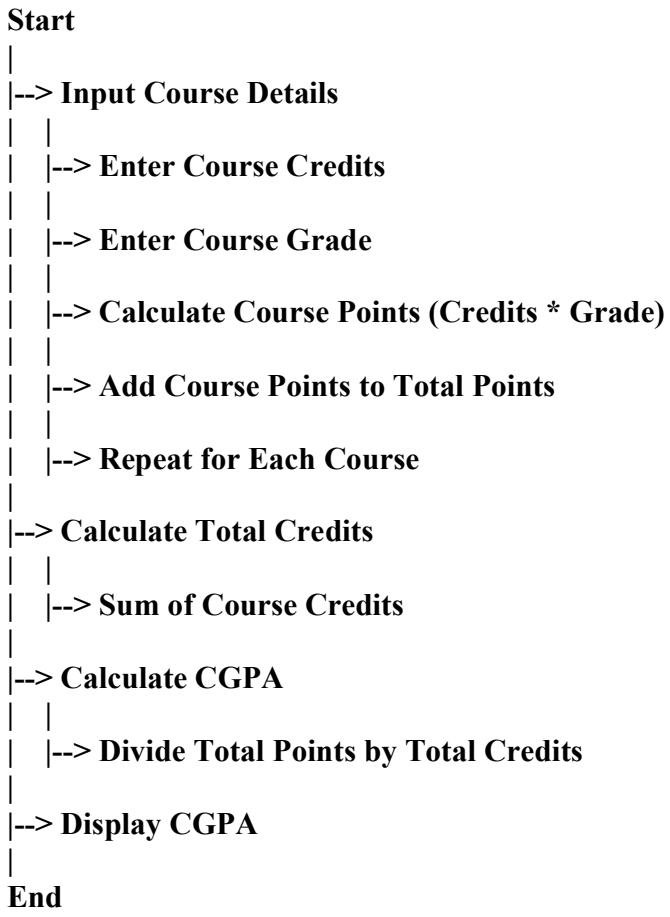


Fig. Depicting flowchart of CGPA calculator

OBSERVED OUPUTS

#Welcomes you and helps in calculating CGPA

"!!!....Welcome to CGPA Calculator....!!!"

Enter the no of subjects: 5

 # Asks for Course marks for 100 marks

Enter the marks of subject 1 out of 100
92

#Asks for grade according to the course

Enter the grade for corresponding subject: 4

Enter the marks of subject 2 out of 100
87

Enter the grade for corresponding subject: 4

Enter the marks of subject 3 out of 100
83

Enter the grade for corresponding subject: 3

Enter the marks of subject 4 out of 100
92

Enter the grade for corresponding subject: 2

Enter the marks of subject 5 out of 100
98

Enter the grade for corresponding subject: 1

#Calculates Total marks

The total marks obtained is: 452

#Calculates Total Credits

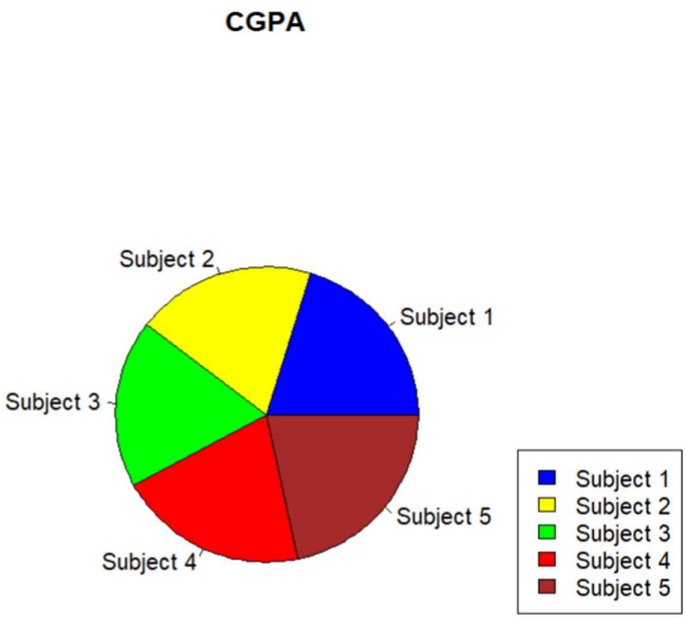
Total credits for all courses is: 14

#Finally outputs the result

The Overall CGPA of this SEM is 9.5

OUTPUT SCREENSHOTS

```
[1] "!!!....Welcome to CGPA Calculator....!!!"

Enter the no of subjects: 5

Enter the marks of subject  1  out of 100
92

Enter the grade for corresponding subject: 4

Enter the marks of subject  2  out of 100
87

Enter the grade for corresponding subject: 4

Enter the marks of subject  3  out of 100
83

Enter the grade for corresponding subject: 3

Enter the marks of subject  4  out of 100
92

Enter the grade for corresponding subject: 2

Enter the marks of subject  5  out of 100
98

Enter the grade for corresponding subject: 1

The total marks obtained is:  452
Total credits for all courses is:  14
The Overall CGPA of this SEM is  9.5
> |
```



CONCLUSION

In conclusion, the development of a CGPA calculator in R programming has provided us with a powerful and versatile tool for simplifying the process of calculating and monitoring academic performance. This project has highlighted the significance of leveraging modern programming languages, like R, to create practical solutions that benefit both students and educational institutions.

The CGPA calculator in R effectively addresses the complexities associated with CGPA computation. By automating the calculation of course points, summing up course credits, and performing the final CGPA calculation, the tool significantly reduces the potential for errors and time spent on manual calculations. Moreover, its user-friendly interface enhances accessibility, allowing students to effortlessly input their course details and retrieve their CGPA.

The development of the CGPA calculator in R underscores the importance of data-driven decision-making in education. It empowers students by providing them with a transparent view of their academic performance, enabling them to make informed choices about their learning journey. Educational institutions can also benefit from the tool by gaining insights into overall academic trends and identifying areas for improvement.

In conclusion, the CGPA calculator in R programming represents a significant step towards improving the accessibility and accuracy of CGPA calculations, fostering a more transparent and informed educational environment for students and institutions alike.

REFERENCES

1. **Books**

   - "R for Data Science" by Hadley Wickham and Garrett Grolemund.
   - "Shiny in Action" by Hadley Wickham.
   - "Data Visualization with ggplot2" by Hadley Wickham.

2. **Blogs and Websites:**

   - R-bloggers: https://www.r-bloggers.com/
   - RStudio blog: https://blog.rstudio.com/
   - R Views: https://rviews.rstudio.com/

3. **Forums and Q&A:**

   - Stack Overflow's R tag: https://stackoverflow.com/questions/tagged/r
   - RStudio Community: https://community.rstudio.com/