VISVESVARAYA TECHNOLOGICAL UNIVERSITY
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BANGALORE INSTITUTE OF TECHNOLOGY
K.R. Road, V.V.Puram, Bangalore-560 004

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

UNIX MINI PROJECT

18CS56

"SGPA CALCULATOR"

Submitted By

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1BI19CS038

for the academic year 2021-22

Department of Computer Science & Engineering
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Certificate

This is to certify that the implementation of **UNIX MINI PROJECT** entitled "**SGPA CALCULATOR**" has been successfully completed by

USN: 1BI19CS038 **NAME: Bharath Gowda B**

of V semester B.E. for the partial fulfillment of the requirements for the Bachelor's degree in Computer Science & Engineering of the Visvesvaraya Technological University during the academic year 2021-2022.

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INTRODUCTION

Universities across the world use unique scoring systems to evaluate the academic performance of students in a specific period. While countries like India commonly use the percentage system, educational institutes in the USA widely use the Grade Point Average (GPA) and Semester Grade Point Average (SGPA). What is SGPA is one of the most asked questions by students seeking information about studying abroad.

There are innumerable systems employed by different education boards to examine, grade, and assess their students on their accomplishments and achievements in an academic year. When a student graduates from a particular institute or board and wishes to take forward with them their merits for the purpose of admission into the next institutes, there arises the need for a universal, standardized method of scoring that has figures recognized by all educational bodies.

What is SGPA?

One of the multiple methods that are there to calculate your performance in schools and colleges is SGPA. It is essentially the grade point average calculated at the end of each session such as a school year or a college semester. It is essential to maintain an attractive SGPA throughout, in order to have an impressive score at the end of your course period. This not only helps in securing a great result, which is an important factor when you wish to pursue higher education at reputed institutes but also aids in understanding your progress and prompts you to work on areas that need attention.

Credit Points

These are basically the measurements of your study load. It is used by universities to assess your progress and completion of the course matters. Individual subjects are assigned credits based on the institutional hours they comprise of. Colleges and universities require you to finish a particular number of credits to be considered for the final examination.

Grade Point

Grades are used to represent how well you have absorbed the information in class and whether you are able to reproduce that information upon being tested. You are typically awarded grade points for each subject that you study as a part of your course, which goes on to be used in deriving your Grade Point Average at the end of each term.

PROBLEM STATEMENT

To develop an application that calculates and returns SGPA (Semester Grade Point Average). This application will be interactive, menu based implemented in shell script.

OBJECTIVES

- Implementing a function that request for basing information such as Branch, Semester for which the user wants to calculate SGPA
- Implementing a function to get marks scored from user and perform operation to get the result
- Print the calculated SGPA

SOFTWARE / HARDWARE REQUIREMENT SPECIFICATION

SOFTWARE

- Command Terminal for executing commands
- Shell Command Language

HARDWARE

- Processor: Any Processor above 500 MHz
- RAM: minimum 512Mb
- Hard Disk: 1 GB
- Basic Input/Output devices

FORMULAS

Marks to Grade Points

Level	Out Standing	Excellent	Very Good	Good	Above Average	Average	Fail
Letter Grade	S	A	B	C	D	E	F
Grade Points	10	9	8	7	6	5	00
Percentage of Marks Scored in a Course	≥90	<90 ≥80	<80 ≥70	<70 ≥60	<60 ≥45	<45 ≥40	<40
	(90-100)	(80-89)	(70-79)	(60-69)	(45-59)	(40-45)	(0-39)

SGPA Formula

$$SGPA = \frac{\Sigma[Course\ Credits\ X\ Grade\ Points]\ for\ all\ the\ Courses\ in\ that\ Semester}{\Sigma[Course\ Credits]\ for\ all\ the\ Courses\ in\ that\ Semester}$$

Example for Computation of SGPA

Course	Credit	Marks Obtained	Grade Letter	Grade point	Credit Point (Credit x Grade)
Course 1	3	90	S	10	30
Course 2	4	85	A	9	36
Course 3	3	70	B	8	24
Course 4	3	86	A	9	27
Course 5	3	78	B	8	24
Course 6	3	75	B	8	24
Course 7	2	45	D	6	12
Course 8	2	78	B	8	16
Course 9	1	80	A	9	9
	24				202

Thus, **SGPA = 202/24 = 8.41**

Implementation

```
#!/bin/sh
echo -e "\t\tSGPA Calculator"
echo ----------------------------------

#Variables to store Course List and Credit Points

semPHY1=(18MATx1 18PHYx2 18ELEx3 18CIVx4 18EGDLx5 18PHYLx6
18ELELx7 18EGHx8)
subPHY1=(MATH Physics ELE Civil EGDLAB PHYLAB ELELAB EGH-I)
credPHY1=(4 4 3 3 3 1 1 1)

semCHE1=(18MATx1 18CHEx2 18CPSx3 18ELNx4 18MEx5 18CHELx6 18CPLx7
18EGHx8)
subCHE1=(MATH CHEMIC CPS ELN EME CHELAB CPLAB EGH-II)
credCHE1=(4 4 3 3 3 1 1 1)

semCS3=(18MAT31 18CS32 18CS33 18CS34 18CS35 18CS36 18CSL37 18CSL38
18xxx39)
subCS3=(MATH-3 DSA ADE CO SE DMS ADELAB DSLAB KxA-CPC)
credCS3=(3 4 3 3 3 3 2 2 1)

semCS4=(18MAT41 18CS42 18CS43 18CS44 18CS45 18CS46 18CSL47 18CSL48
18xxx49)
subCS4=(MATH-4 DAA OS MCES OOC DC DAALAB MCESLAB KxA-CPC)
credCS4=(3 4 3 3 3 3 2 2 1)

semCS5=(18CS51 18CS52 18CS53 18CS54 18CS55 18CS56 18CSL57 18CSL58
18CIV59)
subCS5=(ME CNS DBMS ATCI ADP UNIX CNSLAB DBMSLAB EVS)
credCS5=(3 4 4 3 3 3 2 2 1)

semCS6=(18CS61 18CS62 18CS63 18CS64X 18CS65X 18CSL66 18CSL67
18CSMP68)
subCS6=(SSC CGV WebTech ProfEle OpenEle SSLAB CGVLAB MAD)
credCS6=(4 4 4 3 3 2 2 2)

semCS7=(18CS71 18CS72 18CS73X 18CS74X 18CS75X 18CSL76 18CSP77)
subCS7=(AIML BDA ProEle2 ProEle3 OpenEle AIMLLAB Proj-I)
credCS7=(4 4 3 3 3 2 1)

semCS8=(18CS81 18CS82X 18CSP83 18CSS84 18CSI85)
subCS8=(IoT ProEle4 Proj-II Seminar Intern)
credCS8=(3 3 8 1 3)
```

#Function to Allow user to select a choice

```
branchHandler () {
        echo "Select Branch :"
        echo "1) Physics-Cycle"
        echo "2) Chemisty-Cycle"
        echo "3) Computer Science and Engineering"
        echo -e "\nUse option 1 or 2 for 1st and 2nd Semester of all Branch"
        read -p "Enter choice : " choice
        case $choice in
                1) branch="PHY";semester="1";;
                2) branch="CHE";semester="1";;
                3) branch="CS";read -p "Enter semester : " semester;;
                *) echo Invalid choice;exit;;
        esac
}

branchHandler
echo
sem="sem"$branch$semester[*]
sub="sub"$branch$semester[*]
cred="cred"$branch$semester[*]
```

#Function to read marks of all the courses in specified semester of specified Branch

```
readMarks () {
        declare -a subject='('${!sub}')'
        count=0
        marks=""
        echo "Enter final marks of each subject : "
        for s in ${!sem} ;
        do
                printf "%-8s- %-7s: " $s ${subject[${count}]}
                read m
                count=$(($count + 1))
                grade $m
                g=$?

                if (( $g < 0 || $g > 10 ))
                then
                        echo invalid number
                        return 1
                elif [ $g == 0 ]
                then
                        echo "Failed in $s"
                        marks+=" $g"
                else
                        marks+=" $g"
                fi
        done
```

```
        calSGPA $marks
}
#Function to convert marks to grade point

grade () {
        m=$1
        case $m in
                100) return 10;;
                [9][0-9]) return 10;;
                [8][0-9]) return 9;;
                [7][0-9]) return 8;;
                [6][0-9]) return 7;;
                [5][0-9]) return 6;;
                [4][5-9]) return 6;;
                [4][0-4]) return 4;;
                [0123][0-9]) return 0;;
                [0-9]) return 0;;
                *) return -1;;
        esac
}

#Function to calculate SGPA

calSGPA () {
        declare -a marks='('$*')'
        count=0
        credObt=0
        totalCred=0
        for c in ${!cred} ;
        do
                credObt=`expr $c \* ${marks[$count]} + $credObt`
                totalCred=`expr $c \* 10 + $totalCred`
                count=$(($count + 1))
        done
        echo Total Credits : $totalCred
        echo Credits Obtained : $credObt
        echo SGPA : `echo "scale=2;$credObt * 10 / $totalCred" | bc`
}

readMarks
```

Conclusion

Conclusion This project taught me a lot about programming. I learned how to set a goal for what I wanted my program to look like and do and I went and did it. I found that trial and error in programming is basically the only way to finalize a project to be sure it works 100% correctly. This project was challenging and fun for me and I felt I learned a lot for my first programming class. This project taught me a lot about programming. I learned how to set a goal for what I wanted my program to look like and do and I went and did it. I found that trial and error in programming is basically the only way to finalize a project to be sure it works 100% correctly. This project was challenging and fun for me and I felt I learned a lot for my first programming class.

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