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Course: DAA

Program: B. Tech Computer Engineering

Assignment 1

PROBLEM:

Understand the process of finding
SPI and CPI.

Write an algorithm for the same.
Write a program to solve given problem using your algorithm.

Submit
1. Algorithm
2. Sample input and out put (test cases) minimum 5 different values
Write 50% positive test cases and 50 % negative test cases

3. Program
4. Test the program for the above test cases

5. Conclusion

SOLUTION:

Algorithm: -

- Step1: Start.
- Step2: Read Choice.
- Step3: if(choice==1)
  Go to step 4
  Elseif(choice==2)
  Go to step 5
  Else

Go to step 6.

- Step4: Read SPI for all semesters
  CPI= Sum of all SPI/Total credit points attempted.
  Print CPI
  Go to step 7.
- Step5: Read Semester number
  Read all Grades of all subjects of that semester
  SPI= Sum of grades of all subjects/Total credit points of that semester
  Print SPI
  Go to step 7
- Step6: Print (Please Enter valid input)
  Go to step 3.
- Step7: Stop.

SAMPLE:

Test Case 1:
2
1
Grade[1]= 7, Grade[2]= 8, Grade[3]= 6, Grade[4]= 8, Grade[5]= 5.
SPI= 6
Test Case 2:
2
2
Grade[1]= 5, Grade[2]= 7, Grade[3]= 6, Grade[4]= 5, Grade[5]= 5.
SPI= 5.25
Test Case 3:
1
SPI[1]= 8, SPI[2]= 6, SPI[3]= 8, SPI[4]= 9, SPI[5]= 7, SPI[6]= 9, SPI[7]= 8, SPI[8]= 8;
SPI= 8.15
Test Case 4:
2
5
Grade[1]= 8, Grade[2]= 7, Grade[3]= 9, Grade[4]= 9, Grade[5]= 7.5
SPI= 8.25

PROGRAM:

CPI.cpp > main()

```cpp
#include<iostream>
using namespace std;
int main()
{
    const int T_CPI_Grades=8;
    const int T_SPI_Grades=4;
    float Grades[5];
    float CPI, SPI,Sum_SPI;
    float All_SPI[8];
    int Sem_num;
    int choice;
    cout<<"1. Find CPI for all semesters"<<endl;
    cout<<"2. Find SPI for a specific semester (5  Subjects per semester having max 3 credits per subject)"<<endl;
    cout<<"Enter Your choice: ";
    cin>>choice;

    if(choice==1)
    {
        cout<<"\nEnter SPI for all semesters: ";
        for(int i=0;i<=7;i++)
        {
            cin>>All_SPI[i];
            Sum_SPI+=All_SPI[i];
        }
        CPI= Sum_SPI/T_CPI_Grades;
        cout<<"\nCPI of your Programme is: "<<CPI<<endl;
    }else if(choice==2)
    {
        cout<<"\nEnter the semester number: ";
        cin>>Sem_num;
        cout<<"\nEnter the gained grade points of all five subjects: ";
        for(int i=0;i<=3;i++)
        {
            cin>>Grades[i];
            Sum_SPI+=Grades[i];
        }
        SPI=Sum_SPI/T_SPI_Grades;
        cout<<"\nSPI in "<<Sem_num<<" Semester is: "<<SPI;
    }else{
        cout<<"Please Enter a valid input.";
    }
    return 0;
}
```

OUTPUT:

```
 }
1. Find CPI for all semesters
2. Find SPI for a specific semester
(5  Subjects per semester having max
 3 credits per subject)
Enter Your choice: 2

Enter the semester number:
1

Enter the gained grade points of all
 five subjects: 6
5
8
8

SPI in 1 Semester is: 6.75
PS C:\Users\capta\Code\C++> cd "c:\U
sers\capta\Code\C++\" ; if ($?) { g+
+ CPI.cpp -o CPI } ; if ($?) { .\CPI
 }
1. Find CPI for all semesters
2. Find SPI for a specific semester
(5  Subjects per semester having max
 3 credits per subject)
Enter Your choice: 2
Enter the semester number: 1

Enter the semester number: 1

Enter the gained grade points of all
 five subjects: 5 6 7 8 9

SPI in 1 Semester is: 6.5
PS C:\Users\capta\Code\C++> cd "c:\U
sers\capta\Code\C++\" ; if ($?) { g+
+ CPI.cpp -o CPI } ; if ($?) { .\CPI
 }
1. Find CPI for all semesters
2. Find SPI for a specific semester
(5  Subjects per semester having max
 3 credits per subject)
Enter Your choice: 2

Enter the semester number: 1

Enter the gained grade points of all
 five subjects: 5 5 5 6 7
```

```
 .\CPI }
1. Find CPI for all semesters
2. Find SPI for a specific semester
(5  Subjects per semester having max
 3 credits per subject)
Enter Your choice: 2

Enter the semester number: 1

Enter the gained grade points of all
 five subjects: 9 9 9 9 9

SPI in 1 Semester is: 9
PS C:\Users\capta\Code\C++> cd "c:\U
sers\capta\Code\C++\" ; if ($?) { g+
+ CPI.cpp -o CPI } ; if ($?) { .\CPI
 }
1. Find CPI for all semesters
2. Find SPI for a specific semester
(5  Subjects per semester having max
 3 credits per subject)
Enter Your choice: 2

Enter the semester number: 1

Enter the gained grade points of all
 five subjects: 5
5 5 5 5

SPI in 1 Semester is: 5
PS C:\Users\capta\Code\C++> cd "c:\U
sers\capta\Code\C++\" ; if ($?) { g+
+ CPI.cpp -o CPI } ; if ($?) { .\CPI
 }
1. Find CPI for all semesters
2. Find SPI for a specific semester
(5  Subjects per semester having max
 3 credits per subject)
Enter Your choice: 2

Enter the semester number: 2

Enter the gained grade points of all
 five subjects: 5 4 6 3 7

SPI in 2 Semester is: 4.5
PS C:\Users\capta\Code\C++> cd "c:\U
sers\capta\Code\C++\" ; if ($?) { g+
```

CONCLUSION:

Overall, the algorithm efficiently manages the calculation of academic performance metrics while providing user-friendly error handling. It ensures that valid calculations are performed based on user choices and maintains a robust interaction loop for handling erroneous inputs.