231070055
Chaitra Samant – DAA LAB 01

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(1) ALGORITHM FOR SPI CALCULATOR

// This algorithm calculates pointer of individual semesters.
// Input: 2 arrays, one for grades, other for credits of all courses
// Output: calculated SPI
// FORMULA: $SPI = \sum_{i=1}^{n} \frac{c_1 g_1 + c_2 g_2 + \dots c_n g_n}{c_1 + c_2 + \dots c_n}$.

```
Calc-SPI (gradepoints[], credits[])
    SPI, sum = 0, total-credits = 0, sem_SPI.

    for(i in range (0, credits.size())):
        sum += gradepoints[i] * credits[i]
        total-credits += credits[i]

    SPI = sum/total-credits
    sem_SPI.pushback(SPI)    //Stores all calculated SPIs in a vector
    return SPI.
```

(2) ALGORITHM FOR CPI CALCULATOR

// This algorithm calculates CPI of the student.
// Input: vector sem_SPI
// Output: Calculated CPI, $CPI = \frac{SPI_1 + SPI_2 + \dots SPI_n}{n}$

```
calc_CPI (sem_SPI[])
    sum = 0
    for (i in range (0, sem_SPI.size())
        sum += sem_SPI[i]
    CPI = sum / (sem_SPI.size())
    return CPI
```

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3. TESTCASES:

i. current sem = 1. number of courses in Sem 1 = 4 gradepoints = {8, 10, 8, 7} credits = {3, 2, 3, 3};	OUTPUT: SPI of sem 1 = 8.09 CPI = 8.09.
ii. current sem = 0	OUTPUT: Display error, current sem - can't be less than 1
iii. current sem = 1 number of courses in sem 1 = 5 gradepoints = {8, 8, 9, 10, 11} credits = {3, 1, 3, 2, 2}	OUTPUT: Displayed error, grades cant be more than 10
iv. current sem = 3 number of courses in sem 1 = 5 gradepoints 1 = [10, 9, 9, 8, 10] credits 1 = [3, 3, 1, 2, 3] ~~grad~~ number of courses in sem 2 = 4 gradepoints 2 = [9, 9, 9, 10] credits 2 = [1, 1, 3, 4] number of courses in sem 3 = 5 gradepoints 3 = [10, 10, 8, 9, 10] credits 3 = [2, 2, 3, 3, 1]	OUTPUT: SPI 1 = 9.33 SPI 2 = 9.00 SPI 3 = 9.18 CPI = 9.319.
v. current sem = 1 number of courses in sem 1 = 5 ~~Enter~~ credits 1 = [3, 2, -1, 4, 1]	OUTPUT: Displayed error ~~current sem can't be more than 8.~~ credits can't be negative