21BDS0340

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Structured and Object-Oriented Programming

BCSE102

Program Set 1

### Question 1

### AIM

Given a number n, print the sum of even digit places. If n=1234, then 2+4=6 should be the output. If n=5312, then 3+2=5 should be output.

### Algorithm / Pseudocode

Declare integers Sum as 0 and N

Read input and assign to N

Calculate Sum as the sum of the second and fourth digit

Display Sum

### Program Code

// 21BDS0340 Abhinav Dinesh Srivatsa

#include <stdio.h>

int main()

{

    int n, sum = 0;

    scanf("%d", &n);

    sum = (n / 100) % 10 + n % 10;

    printf("%d", sum);

}

### Graphical user interface, application Description automatically generatedOutput

### Question 2

### AIM

Scan three values and a symbol, based on the symbol (+ or -) using switch statement, do addition, subtraction operation respectively

### Algorithm / Pseudocode

### Declare integers A, B, C

### Declare character Op

### Read all the above from input

### Switch Op

### If Op is '+', then display A + B + C

### If Op is '-', then display absolute value of A - B – C

### Program Code

// 21BDS0340 Abhinav Dinesh Srivatsa

#include <stdio.h>

#include <stdlib.h>

int main()

{

    int a, b, c;

    char op;

    scanf("%d%d%d %c", &a, &b, &c, &op);

    switch (op)

    {

    case '+':

        printf("%d", a + b + c);

        break;

    case '-':

        printf("%d", abs(a - b - c));

        break;

    }

}

### Graphical user interface, application Description automatically generatedOutput

### Question 3

### AIM

Develop C program with following functions

void readName\_RegNo(char \*name);

void readMarks\_RegNo(int marks[3]);

void readClassAverage\_RegNo(int \*avg);

int AboveOrBelowAverage\_RegNo(int \*marks);

to read a name, three marks of a student. Also get class average value from user, using above function signature. Calculate average of the three marks of the student and compare with class average and display whether “StudentName has above Class Average score” or “StudentName has below Class Average score” or “StudentName has average score same as Class Average”. Make sure all marks are entered in the range 0 to 100, otherwise specify “Not in Range” message to the user.

### Algorithm / Pseudocode

readName\_21BDS0340(char \*Name)

Read input and assign to Name

readMarks\_21BDS0340(int Marks[3])

Loop from 0 to 3 as X

Read input and assign to Marks[X]

readClassAverage\_21BDS0340(int \*Avg)

Read input and assign to Avg

AboveOrBelowAverage\_21BDS0340(int \*Marks)

Declare integer Sum as 0

Loop from 0 to 3 as X

Calculate Sum as Sum + Marks[X]

Return Sum / 3

Declare character array Name with 20 spaces

Declare integer array Marks with 3 spaces

Declare integer Avg

Declare integer Flag

Call readName\_21BDS0340(Name)

Call readMarks\_21BDS0340(Marks)

Check if all Marks are between 0 and 100

If not, then display "Not in Range" and set Flag as 1

If Flag = 0, then

Call readClassAverage\_21BDS0340(Avg)

Declare integer Mean by calling AboveOrBelowAverage\_21BDS0340(Marks)

If Mean > Avg, then display "StudentName has above Class Average score"

If Mean = Avg, then display "StudentName has average score same as Class Average"

If Mean < Avg, then display "StudentName has below Class Average score"

### Program Code

// 21BDS0340 Abhinav Dinesh Srivatsa

#include <stdio.h>

void readName\_21BDS0340(char \*name)

{

    scanf("%s", name);

}

void readMarks\_21BDS0340(int marks[3])

{

    for (int x = 0; x < 3; x++)

    {

        scanf("%d", &marks[x]);

    }

}

void readClassAverage\_21BDS0340(int \*avg)

{

    scanf("%d", avg);

}

int AboveOrBelowAverage\_21BDS0340(int \*marks)

{

    int sum = 0;

    for (int x = 0; x < 3; x++)

    {

        sum += marks[x];

    }

    return sum / 3;

}

int main()

{

    char name[20];

    int marks[3];

    int avg;

    int flag = 0;

    readName\_21BDS0340(name);

    readMarks\_21BDS0340(marks);

    for (int x = 0; x < 3; x++)

    {

        if (marks[x] < 0 || marks[x] > 100)

        {

            printf("Not in Range");

            flag = 1;

            break;

        }

    }

    if (flag == 0)

    {

        readClassAverage\_21BDS0340(&avg);

        int mean = AboveOrBelowAverage\_21BDS0340(marks);

        if (mean > avg)

        {

            printf("%s has above Class Average score", name);

        }

        if (mean == avg)

        {

            printf("%s has average score same as Class Average", name);

        }

        if (mean < avg)

        {

            printf("%s has below Class Average score", name);

        }

    }

}

### Graphical user interface, application Description automatically generatedOutput