21BDS0340

Abhinav Dinesh Srivatsa

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

```c
// 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);
}
```

Output

Test	Input	Result
1	1234	6

Answer: (penalty regime: 0 %)

```c
// 21BDS0340 Abhinav Dinesh Srivatsa
/*
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
*/

#include <stdio.h>

int main()
{
    int n, sum = 0;
    scanf("%d", &n);
    sum = (n / 100) % 10 + n % 10;
    printf("%d", sum);
}
```

Check

	Test	Input	Expected	Got	
✔	1	1234	6	6	✔
✔	2	5312	5	5	✔

Passed all tests! ✔

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1 2 3

Finish attempt ...

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

```c
// 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;
    }
}
```

Output

Test	Input	Result
1	2 3 2 +	7

Answer: (penalty regime: 0 %)

```
// 21BDS0340 Abhinav Dinesh Srivatsa
/*
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
*/

#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);
```

Check

	Test	Input	Expected	Got	
✔	1	2 3 2 +	7	7	✔
✔	2	100 200 300 -	400	400	✔

Passed all tests! ✔

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1 2 3

Finish attempt ...

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);
        }
    }
}
```

Output

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.

For example:

Test	Input	Result
1	Abc 60 70 80 77	Abc has below Class Average score

Answer: (penalty regime: 0 %)

```
// 21BDS0340 Abhinav Dinesh Srivatsa
/*
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
```

Check

	Test	Input	Expected	Got
✔	1	Abc 60 70 80 77	Abc has below Class Average score	Abc has below Class A
✔	2	Def 66 75 84 75	Def has average score same as Class Average	Def has average score

Passed all tests! ✔

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1 2 3

Finish attempt ...