

### Assignment 4.1: Switch Case

#### Switch Case

**Course Code:** CPE007

**Program:** Computer Engineering

**Course Title:** Programming Logic and Design

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#### Output

1. Using switch statement Write a C++ program to input marks of five subjects Physics, Biology and Math. Calculate percentage and grade according to following:

Percentage  $\geq 90\%$  : Grade A  
Percentage  $\geq 80\%$  : Grade B  
Percentage  $\geq 70\%$  : Grade C  
Percentage  $\geq 60\%$  : Grade D  
Percentage  $\geq 40\%$  : Grade E  
Percentage  $< 40\%$  : Grade F

---

*The output should be similar to the one below:*

Physics : 80  
Biology : 80  
Math : 80

---

Average is : \_\_\_\_

Grade Level: \_\_\_\_

#### CODE:

```
#include <iostream>
```

```
int main () {
```

```
    float physicsMark;  
    float bioMark;  
    float mathMark;  
    float markTotal;  
    float percentage;  
    char grade;
```

```
    std::cout<<"Enter Mark For Physics: ";  
    std::cin>>physicsMark;
```

```
    std::cout<<"Enter Mark For Biology: ";  
    std::cin>>bioMark;
```

```
    std::cout<<"Enter Mark For Math: ";  
    std::cin>>mathMark;
```

```
    markTotal = physicsMark + bioMark + mathMark;  
    percentage = (markTotal/300.00) * 100.00;
```

```

switch (static_cast<int>(percentage)/10){
    case 10:
    case 9:
        grade = 'A';
        break;
    case 8:
        grade = 'B';
        break;
    case 7:
        grade = 'C';
        break;
    case 6:
        grade = 'D';
        break;
    case 5:
    case 4:
        grade = 'E';
        break;
    default:
        grade = 'F';
        break;
}

std::cout << "\n";
std::cout << "Physics Mark: " << static_cast<int>(physicsMark)<< std::endl;
std::cout << "Biology Mark: " << static_cast<int>(bioMark)<< std::endl;
std::cout << "Math Mark: " << static_cast<int>(mathMark)<< std::endl;
std::cout << "_____ "<< std::endl;

std::cout<< "Average is "<< percentage <<"%"<<std::endl;
std::cout<< "Grade Level: " <<grade <<std::endl;

return 0;
}

```

## RESULTS: GRADE A

The screenshot shows a C++ IDE with two windows. The left window displays the source code for 'Untitled1.cpp', which includes a switch-case statement for determining a grade based on a percentage. The right window shows the program's output, where the user has entered marks for Physics (100), Biology (99), and Math (98), resulting in an average of 99% and a grade of A.

```
#include <iostream>

int main () {
    float physicsMark;
    float bioMark;
    float mathMark;
    float markTotal;
    float percentage;
    char grade;

    std::cout<<"Enter Mark For Physics: ";
    std::cin>>physicsMark;

    std::cout<<"Enter Mark For Biology: ";
    std::cin>>bioMark;

    std::cout<<"Enter Mark For Math: ";
    std::cin>>mathMark;

    markTotal = physicsMark + bioMark + mathMark;
    percentage = (markTotal/300.00) * 100.00;

    switch (static_cast<int>(percentage)/5){
        case 10:
            grade = 'A';
            break;
        case 8:
            grade = 'B';
            break;
        case 7:
            grade = 'C';
            break;
        case 6:
            grade = 'D';
            break;
        case 5:
            grade = 'E';
            break;
        default:
            grade = 'F';
            break;
    }

    std::cout<<"\n";
    std::cout<<"Physics Mark: " << static_cast<int>(physicsMark)<< std::endl;
    std::cout<<"Biology Mark: " << static_cast<int>(bioMark)<< std::endl;
    std::cout<<"Math Mark: " << static_cast<int>(mathMark)<< std::endl;
    std::cout<<"Average is " << percentage << "%\n";
    std::cout<<"Grade Level: " << grade << std::endl;

    return 0;
}
```

```
Enter Mark For Physics: 100
Enter Mark For Biology: 99
Enter Mark For Math: 98

Physics Mark: 100
Biology Mark: 99
Math Mark: 98

Average is 99%
Grade Level: A

-----
Process exited after 7.375 seconds with return value 0
Press any key to continue . . .
```

## GRADE B

The screenshot shows the same C++ IDE with the program executed using different input values. The user entered marks for Physics (90), Biology (89), and Math (88), resulting in an average of 89% and a grade of B.

```
#include <iostream>

int main () {
    float physicsMark;
    float bioMark;
    float mathMark;
    float markTotal;
    float percentage;
    char grade;

    std::cout<<"Enter Mark For Physics: ";
    std::cin>>physicsMark;

    std::cout<<"Enter Mark For Biology: ";
    std::cin>>bioMark;

    std::cout<<"Enter Mark For Math: ";
    std::cin>>mathMark;

    markTotal = physicsMark + bioMark + mathMark;
    percentage = (markTotal/300.00) * 100.00;

    switch (static_cast<int>(percentage)/5){
        case 10:
            grade = 'A';
            break;
        case 8:
            grade = 'B';
            break;
        case 7:
            grade = 'C';
            break;
        case 6:
            grade = 'D';
            break;
        case 5:
            grade = 'E';
            break;
        default:
            grade = 'F';
            break;
    }

    std::cout<<"\n";
    std::cout<<"Physics Mark: " << static_cast<int>(physicsMark)<< std::endl;
    std::cout<<"Biology Mark: " << static_cast<int>(bioMark)<< std::endl;
    std::cout<<"Math Mark: " << static_cast<int>(mathMark)<< std::endl;
    std::cout<<"Average is " << percentage << "%\n";
    std::cout<<"Grade Level: " << grade << std::endl;

    return 0;
}
```

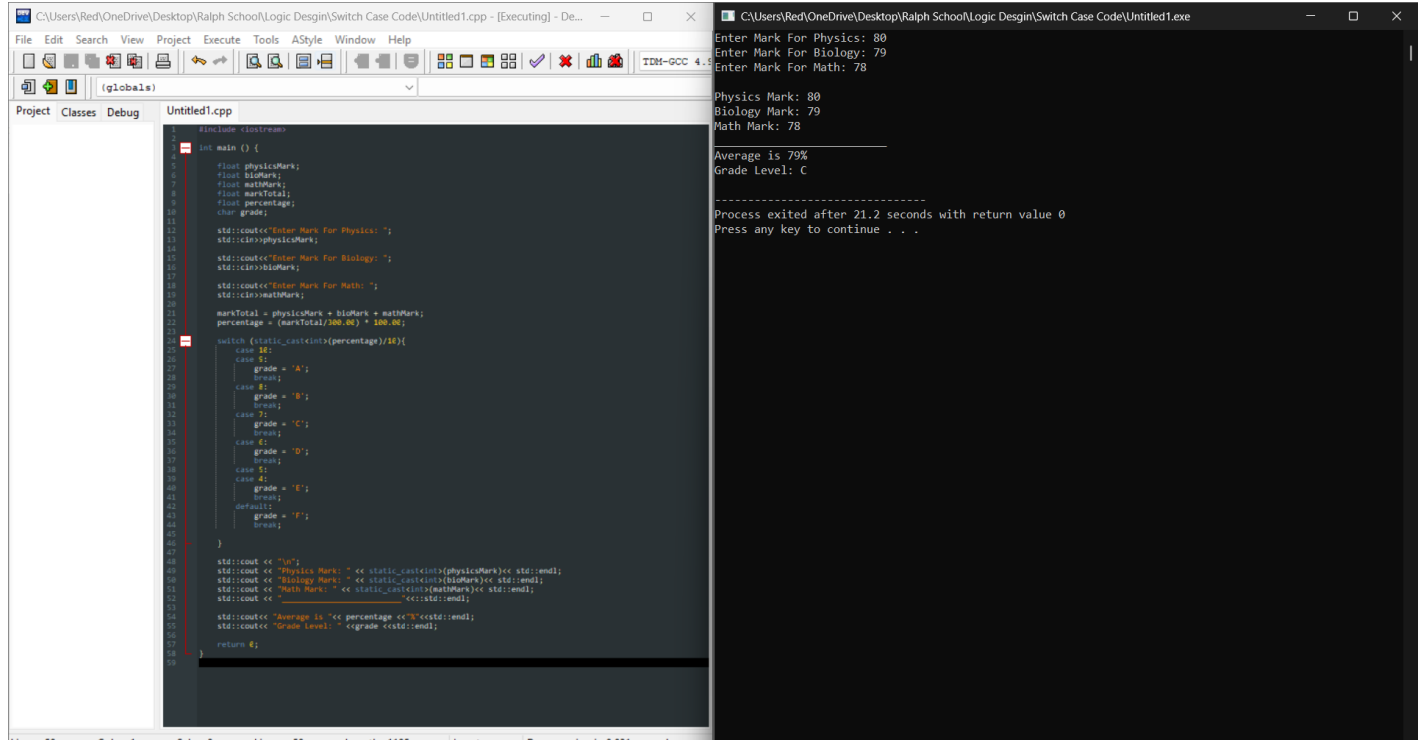
```
Enter Mark For Physics: 90
Enter Mark For Biology: 89
Enter Mark For Math: 88

Physics Mark: 90
Biology Mark: 89
Math Mark: 88

Average is 89%
Grade Level: B

-----
Process exited after 14.66 seconds with return value 0
Press any key to continue . . .
```

## GRADE C



```
function __cdecl main()
{
    int main() {
        float physicsMark;
        float bioMark;
        float mathMark;
        float markTotal;
        float percentage;
        char grade;

        std::cout<<"Enter Mark For Physics: ";
        std::cin>>physicsMark;

        std::cout<<"Enter Mark For Biology: ";
        std::cin>>bioMark;

        std::cout<<"Enter Mark For Math: ";
        std::cin>>mathMark;

        markTotal = physicsMark + bioMark + mathMark;
        percentage = (markTotal/300.00) * 100.00;

        switch (static_cast<int>(percentage)/10){
            case 10:
                grade = 'A';
                break;
            case 9:
                grade = 'B';
                break;
            case 8:
                grade = 'C';
                break;
            case 7:
                grade = 'D';
                break;
            case 6:
                grade = 'E';
                break;
            case 5:
                grade = 'F';
                break;
            default:
                grade = 'F';
                break;
        }

        std::cout<<"\n";
        std::cout<<"Physics Mark: " << static_cast<int>(physicsMark)<<"\n";
        std::cout<<"Biology Mark: " << static_cast<int>(bioMark)<<"\n";
        std::cout<<"Math Mark: " << static_cast<int>(mathMark)<<"\n";
        std::cout<<"Average is " << percentage <<"%\n";
        std::cout<<"Grade Level: " << grade <<"\n";

        return 0;
    }
}
```

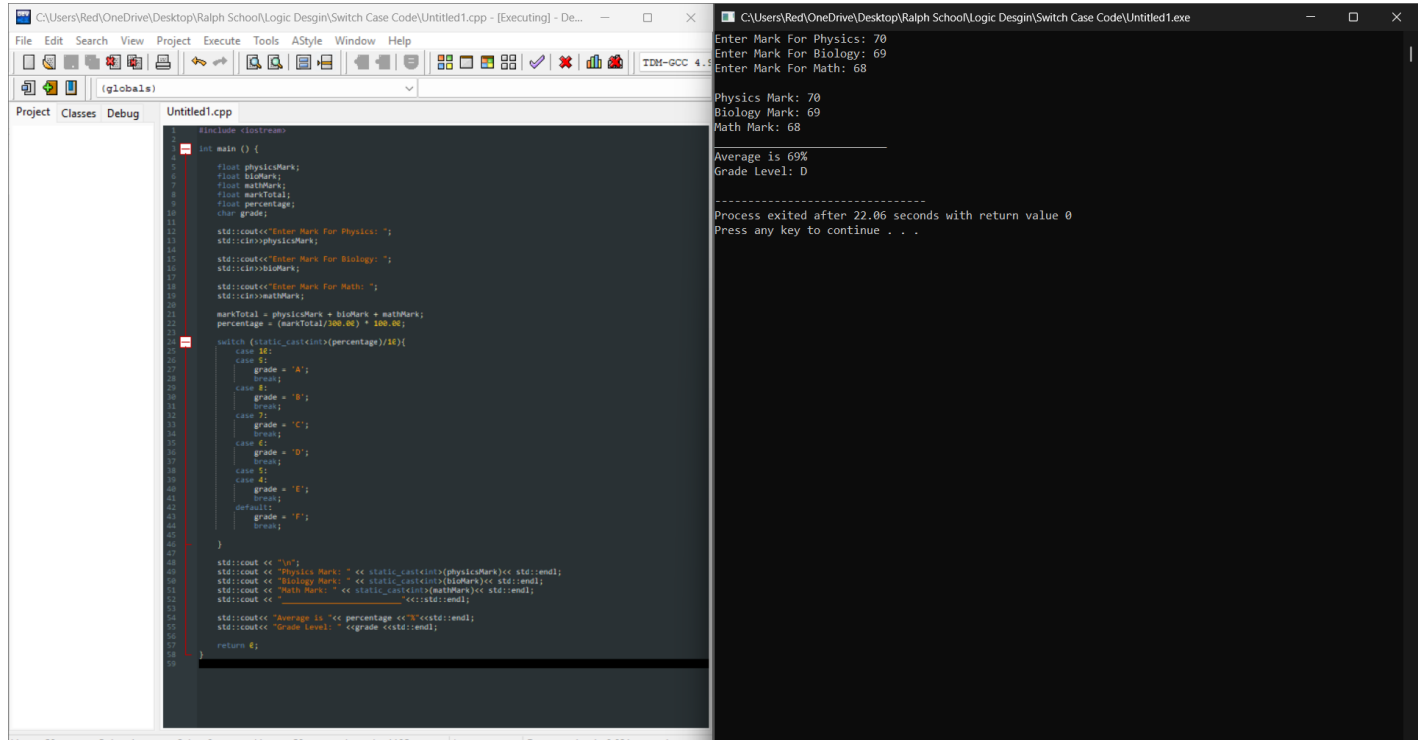
Enter Mark For Physics: 80  
Enter Mark For Biology: 79  
Enter Mark For Math: 78

Physics Mark: 80  
Biology Mark: 79  
Math Mark: 78

Average is 79%  
Grade Level: C

Process exited after 21.2 seconds with return value 0  
Press any key to continue . . .

## GRADE D



```
function __cdecl main()
{
    int main() {
        float physicsMark;
        float bioMark;
        float mathMark;
        float markTotal;
        float percentage;
        char grade;

        std::cout<<"Enter Mark For Physics: ";
        std::cin>>physicsMark;

        std::cout<<"Enter Mark For Biology: ";
        std::cin>>bioMark;

        std::cout<<"Enter Mark For Math: ";
        std::cin>>mathMark;

        markTotal = physicsMark + bioMark + mathMark;
        percentage = (markTotal/300.00) * 100.00;

        switch (static_cast<int>(percentage)/10){
            case 10:
                grade = 'A';
                break;
            case 9:
                grade = 'B';
                break;
            case 8:
                grade = 'C';
                break;
            case 7:
                grade = 'D';
                break;
            case 6:
                grade = 'E';
                break;
            case 5:
                grade = 'F';
                break;
            default:
                grade = 'F';
                break;
        }

        std::cout<<"\n";
        std::cout<<"Physics Mark: " << static_cast<int>(physicsMark)<<"\n";
        std::cout<<"Biology Mark: " << static_cast<int>(bioMark)<<"\n";
        std::cout<<"Math Mark: " << static_cast<int>(mathMark)<<"\n";
        std::cout<<"Average is " << percentage <<"%\n";
        std::cout<<"Grade Level: " << grade <<"\n";

        return 0;
    }
}
```

Enter Mark For Physics: 70  
Enter Mark For Biology: 69  
Enter Mark For Math: 68

Physics Mark: 70  
Biology Mark: 69  
Math Mark: 68

Average is 69%  
Grade Level: D

Process exited after 22.06 seconds with return value 0  
Press any key to continue . . .

## GRADE E

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug

Untitled1.cpp

```
1 #include <iostream>
2
3 int main () {
4     float physicsMark;
5     float bioMark;
6     float mathMark;
7     float markTotal;
8     float percentage;
9     char grade;
10
11     std::cout<<"Enter Mark For Physics: ";
12     std::cin>>physicsMark;
13
14     std::cout<<"Enter Mark For Biology: ";
15     std::cin>>bioMark;
16
17     std::cout<<"Enter Mark For Math: ";
18     std::cin>>mathMark;
19
20     markTotal = physicsMark + bioMark + mathMark;
21     percentage = (markTotal/300.00) * 100.00;
22
23     switch (static_cast<int>(percentage)/50){
24     case 0:
25         grade = 'A';
26         break;
27     case 1:
28         grade = 'B';
29         break;
30     case 2:
31         grade = 'C';
32         break;
33     case 3:
34         grade = 'D';
35         break;
36     case 4:
37         grade = 'E';
38         break;
39     case 5:
40         grade = 'F';
41         break;
42     default:
43         grade = 'F';
44         break;
45     }
46
47     std::cout << "\n";
48     std::cout << "Physics Mark: " << static_cast<int>(physicsMark)<< std::endl;
49     std::cout << "Biology Mark: " << static_cast<int>(bioMark)<< std::endl;
50     std::cout << "Math Mark: " << static_cast<int>(mathMark)<< std::endl;
51     std::cout << "Average is " << percentage << "%\n";
52
53     std::cout<<"Average is "<<percentage<<"%\n"<<std::endl;
54     std::cout<<"Grade Level: " <<grade<<std::endl;
55
56     return 0;
57 }
```

Line: 59 Col: 1 Sel: 0 Lines: 59 Length: 1195 Insert Done parsing in 0.031 seconds

C:\Users\Red\OneDrive\Desktop\Ralph School\Logic Desgin\Switch Case Code\Untitled1.exe

Enter Mark For Physics: 60  
Enter Mark For Biology: 59  
Enter Mark For Math: 58  
  
Physics Mark: 60  
Biology Mark: 59  
Math Mark: 58  
  
Average is 59%  
Grade Level: E  
  
-----  
Process exited after 32.35 seconds with return value 0  
Press any key to continue . . .

## GRADE F

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

Project Classes Debug

Untitled1.cpp

```
1 #include <iostream>
2
3 int main () {
4     float physicsMark;
5     float bioMark;
6     float mathMark;
7     float markTotal;
8     float percentage;
9     char grade;
10
11     std::cout<<"Enter Mark For Physics: ";
12     std::cin>>physicsMark;
13
14     std::cout<<"Enter Mark For Biology: ";
15     std::cin>>bioMark;
16
17     std::cout<<"Enter Mark For Math: ";
18     std::cin>>mathMark;
19
20     markTotal = physicsMark + bioMark + mathMark;
21     percentage = (markTotal/300.00) * 100.00;
22
23     switch (static_cast<int>(percentage)/50){
24     case 0:
25         grade = 'A';
26         break;
27     case 1:
28         grade = 'B';
29         break;
30     case 2:
31         grade = 'C';
32         break;
33     case 3:
34         grade = 'D';
35         break;
36     case 4:
37         grade = 'E';
38         break;
39     case 5:
40         grade = 'F';
41         break;
42     default:
43         grade = 'F';
44         break;
45     }
46
47     std::cout << "\n";
48     std::cout << "Physics Mark: " << static_cast<int>(physicsMark)<< std::endl;
49     std::cout << "Biology Mark: " << static_cast<int>(bioMark)<< std::endl;
50     std::cout << "Math Mark: " << static_cast<int>(mathMark)<< std::endl;
51     std::cout << "Average is " << percentage << "%\n";
52
53     std::cout<<"Average is "<<percentage<<"%\n"<<std::endl;
54     std::cout<<"Grade Level: " <<grade<<std::endl;
55
56     return 0;
57 }
```

Line: 59 Col: 1 Sel: 0 Lines: 59 Length: 1195 Insert Done parsing in 0.031 seconds

C:\Users\Red\OneDrive\Desktop\Ralph School\Logic Desgin\Switch Case Code\Untitled1.exe

Enter Mark For Physics: 40  
Enter Mark For Biology: 39  
Enter Mark For Math: 38  
  
Physics Mark: 40  
Biology Mark: 39  
Math Mark: 38  
  
Average is 39%  
Grade Level: F  
  
-----  
Process exited after 22.06 seconds with return value 0  
Press any key to continue . . .

## PSEUDO CODE:

start

INPUT physics mark

INPUT biology mark

INPUT math mark

markTotal = physicsMark + bioMark + mathMark

percentage = (markTotal/300.00) \* 100.00

SET grade = INTEGER(percentage) / 10

CASE 10, 9:

SET grade = 'A'

CASE 8:

SET grade = 'B'

CASE 7:

SET grade = 'C'

CASE 6:

SET grade = 'D'

CASE 5, 4:

SET grade = 'E'

DEFAULT:

SET grade = 'F'

PRINT physics

PRINT biology mark

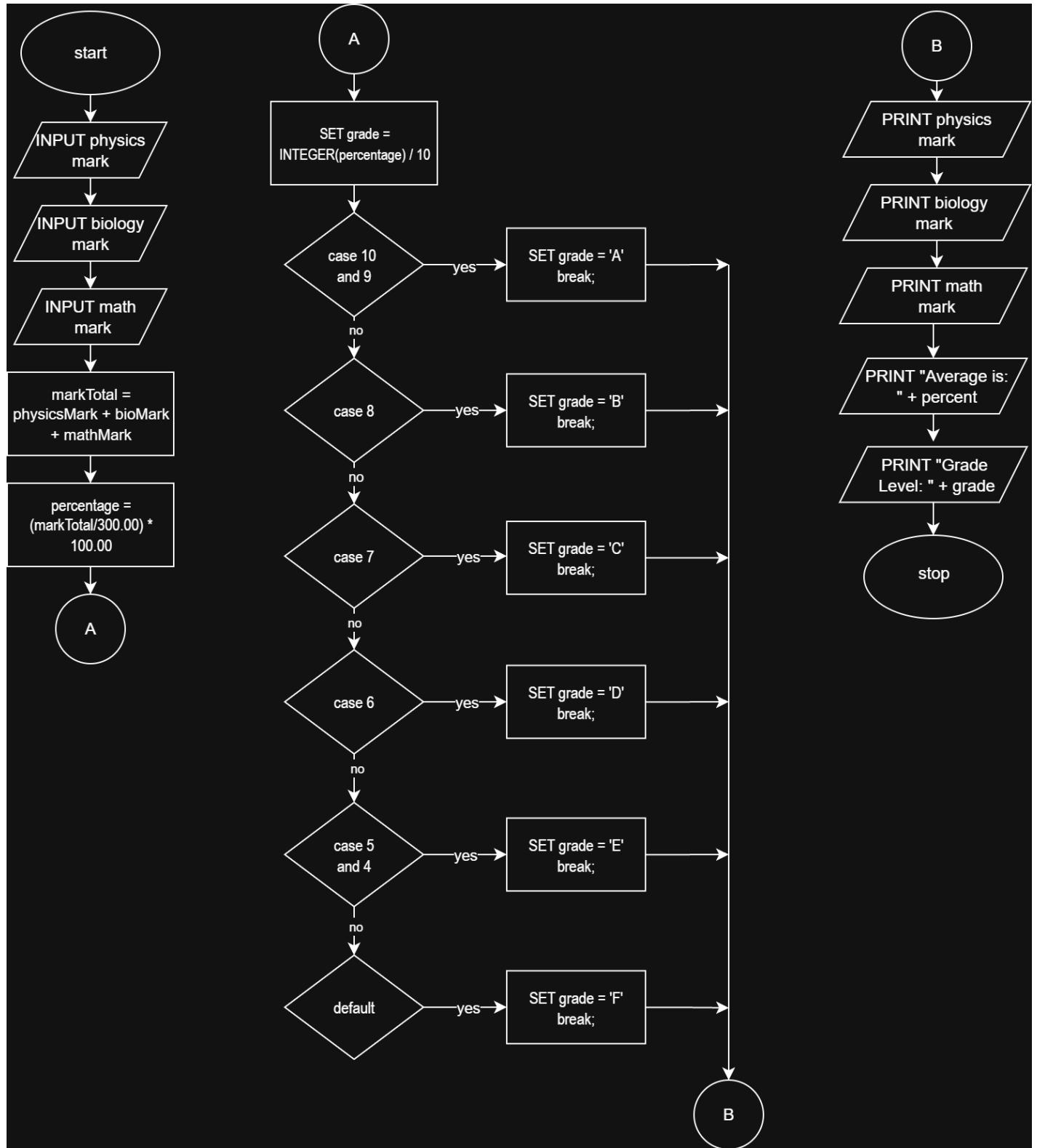
PRINT math mark

PRINT "Average is" + percent

PRINT "Grade Level" + grade

stop

## FLOWCHART:



## Supplementary Activity

## Conclusion

It took me a while to figure out how to implement the switch case so that it could choose either case 1, case 2, or everything else, but after a lot of trial and error, I managed to make it work at the end. I just had to think logically by

adding equations first so that it could pick a number for the cases. The flowchart was quite difficult for me because I was trying my best for it to make sense not just to me but to others as well.

This assignment was helpful; it made me realize that I could do more with switch cases than the simple examples I've seen online and in videos.