

# ITP Assignment 2

Program to calculate age by finding difference between current date and date of birth.

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***Abstract: In this paper we have devised an algorithm to calculate age by finding the difference between the current date and the date of birth.***

## I. Introduction

Given the date of birth in - “DD MM YYYY” format, and the current date in the same format, we will calculate the age difference between the two.

We will use structures here to store the date of birth, current date and the difference between the two.

A structure is a user defined data type in C/C++. A structure creates a data type that can be used to group items of possibly different types into a single type.

## II. Algorithm design

We have defined a structure named “date” here which contains three int data types named as days, months

and years respectively.

```
struct date
{
    int days;
    int months;
    int years;
};
```

Then using this structure as,

```
struct date dob;
```

1. Storing the dates in structures will decrease the written code as we don't need to write the same input/output statements for the date of birth, current date and the difference between the two again.

2. Now, after storing both the dates, we will take the difference between the current date and the date of birth. If the difference between the two dates is less than 0, we will carry over one month and add 30 to the difference, since every month does not have 30 days, we will add a correction factor over the months to

equalize it.

We will add the correction factor by using the switch statement.

```
dif.days = current.days - dob.days;
int correction = 0;
if (dif.days < 0)
{
    dif.days += 30;
    current.months--;
    switch (current.months)
    {
        case 1:
        case 3:
        case 5:
        case 7:
        case 8:
        case 10:
        case 12:
            correction = 1;
            break;
        case 2:
            correction = -2;
            break;
    }
}
```

3. Now, we will continue to subtract the months of the two dates. If the difference is smaller than 0, we will borrow one from the year and add 12 to the difference of months.

4. Continuing this, we will calculate the difference between the years. If the difference between the two is negative, this means that the current date is before the date of birth, which is invalid, so we will output an invalid warning.

```
dif.years = current.years - dob.years;
if (dif.years < 0)
{
    printf("\nWrong format between the current and the date of birth");
    return 0;
}
```

5. Now, we will display the difference between the two dates in the form of days, months and years.

### III. Example

```
Enter the date of birth
29 09 2003
Enter the current date
31 1 2022
You are currently 2 days, 4 months and 18 years old.
```

### IV. Time Complexity

Since the process isn't dependent on any time factor, it will run in constant time, irrespective of the input values. Hence, the program will be of  $O(1)$  complexity.

### VI. Conclusion

So, we have used the properties of structures in this code to reduce the complexity of the code and make it more presentable while dealing with heterogeneous data types.

### V. References

1. <https://www.geeksforgeeks.org/structures-c/>
2. <https://stackoverflow.com/>

GitHub repo link:

<https://github.com/pvtrpndy/ITP-2-2022.git>

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## Raw Code:

```
#include <stdio.h>

struct date
{
    int days;
    int months;
    int years;
};

int main()
{
    struct date dob;
    struct date current;
    printf("\nEnter the date of birth\n");
    scanf("%d%d%d", &dob.days, &dob.months, &dob.years);

    printf("\nEnter the current date\n");
    scanf("%d%d%d", &current.days, &current.months, &current.years);

    struct date dif;

    dif.days = current.days - dob.days;
    int correction = 0;
    if (dif.days < 0)
    {
        dif.days += 30;
        current.months--;
        switch (current.months)
        {
            case 1:
            case 3:
            case 5:
            case 7:
            case 8:
            case 10:
            case 12:
                correction = 1;
                break;
            case 2:
                correction = -2;
                break;
        }
    }

    dif.days += correction;

    dif.months = current.months - dob.months;
    if (dif.months < 0)
    {
        dif.months += 12;
        current.years--;
    }

    dif.years = current.years - dob.years;
    if (dif.years < 0)
    {
        printf("\nWrong format between the current and the date of birth");
        return 0;
    }
    printf("\nYou are currently %d days, %d months and %d years old.", dif.days, dif.months, dif.years);
}
```