CODE COMPREHENSION

Python vs C

A REPORT

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Under the Guidance of

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INTRODUCTION

In this presentation, we will dive into:

The key differences between C and Python, from syntax to memory management.

How they approach problem-solving with real-world examples, such as calculating totals and averages.

The trade-offs they offer in terms of performance, ease of use, and flexibility.

The project has been implemented in both Python and C, two programming languages,allowing us to explore their unique features and capabilities in solving real-world problems.We chose this project to gain experience with data management, user interaction,and programming logic in both high-level and low-level environments.

PROBLEM STATEMENT

Calculating the cost of a trip based on the following-

Input to be taken- Distance(in km) and the mode of travel

Constraint: Ensure that cost per km for each mode is predefined and realistic For ex:- car=$0.5/km, train=$0.3/km

Calculating the output of the program for a journey of 20km for a passenger aged 65 (Add discounts for specific age groups while calculating the total cost of the trip)

CODE

C

```c
#include <stdio.h>

int main() {
    float carfare, trainfare, flightfare, distance;
    int age;
    char mode;

    printf("Enter the mode of travel (C for Car, T for Train, F for Flight): ");
    scanf("%c", &mode);
    printf("Enter the distance you are travelling: ");
    scanf("%f", &distance);
    printf("Enter your Age: ");
    scanf("%d", &age);


    if (mode == 'c' || mode == 'C') {
        if (age >= 65) {
            printf("You got 30% discount\n");
            carfare = distance * 0.8;
            carfare -= 0.3 * carfare;
            printf("Your total Cost of fare is : %.2f\n", carfare);
        } else if (age > 12 && age=<65) {
            printf("No discount\n");
            carfare = distance * 0.8;
            printf("Your total Cost of fare is : %.2f\n", carfare);
        } else {
            printf("You got 50% discount\n");
            carfare = distance * 0.8;
            carfare -= 0.5 * carfare;
            printf("Your total Cost of fare is : %.2f\n", carfare);
        }
```

```c
    } else if (mode == 't' || mode == 'T') {
        if (age >=65) {
            printf("You got 30% discount\n");
            trainfare = distance * 1.2;
            trainfare -= 0.3 * trainfare;
            printf("Your total cost of fare is: %.2f\n", trainfare);
        } else if (age > 12) {
            printf("No discount\n");
            trainfare = distance * 1.2;
            printf("Your total cost of fare is: %.2f\n", trainfare);
        } else {
            printf("You got 50% discount\n");
            trainfare = distance * 1.2;
            trainfare -= 0.5 * trainfare;
            printf("Your total cost of fare is: %.2f\n", trainfare);
        }
    } else if (mode == 'f' || mode == 'F') {
        if (age >=65) {
            printf("You got 30% discount\n");
            flightfare = distance * 5;
            flightfare -= 0.3 * flightfare;
            printf("Your total cost of fare is:%.2f\n", flightfare);
        } else if (age > 12) {
            printf("No discount\n");
            flightfare = distance * 5;
            printf("Your total cost of fare is:%.2f\n", flightfare);
        } else {
            printf("You got 50% discount\n");
            flightfare = distance * 5;
```

```
    } else if (mode == 'f' || mode == 'F') {
        if (age >=65) {
            printf("You got 30% discount\n");
            flightfare = distance * 5;
            flightfare -= 0.3 * flightfare;
            printf("Your total cost of fare is:%.2f\n", flightfare);
        } else if (age > 12) {
            printf("No discount\n");
            flightfare = distance * 5;
            printf("Your total cost of fare is:%.2f\n", flightfare);
        } else {
            printf("You got 50% discount\n");
            flightfare = distance * 5;
            flightfare -= 0.5 * flightfare;
            printf("Your total cost of fare is:%.2f\n", flightfare);
        }
    } else {
        printf("Invalid Input");
    }

    return 0;
}

```

Output

```
$ ./demo
------------------Welcome to the Trip planner by Pycharmers-----------
Enter the mode of travel (C for Car, T for Train, F for Flight): t
Enter the distance you are travelling: 20
Enter your Age: 65
You got 30 6422284iscount
Your total cost of fare is: 16.80

intel@Pratyush MINGW64 ~/OneDrive/Desktop/pps code comprehension
$
```

Algorithm

Step 1: Start the program
Step 2: define the constraints
1. Cost for car is 0.8/km
2.Cost for train is 1.2/km
3.cost for flight is 5/km
4.Characters for mode of travelling
Step3:take the input for the desired conditions
Step4: by using conditional statements, declare the conditions
If age<=5, Give free of cost trip.
If age >5 and age<=12, give 50% discount on whole trip.
If age >12 and age<=64, no discount for the trip.
If age >=65, give 30% discount on whole trip.
Step5 : display the Total fare of the trip
Step 6: End the program

Python-

```
car=0.8  #cost of per Km distance by car in Rs.
train=1.2   #cost of per Km distance by train in Rs.
flight=5   #cost of per Km distance by flight in Rs.

print("Welcome to the Trip planner by Pycharmers...")

dis=int(input("Enter the total distance travelled:"))
mode=input("Enter mode of travelling:")
age=int(input("Enter the age of passenger:"))

if age>0 and age<=5:
    print("Your trip is FREE OF COST....")

elif age>5 and age<=12:
    print("You got 50% discount on your trip.....")
    if mode=="car" or mode=="CAR":
        fare=0.5*car*dis
        print("The total cost of the trip is: Rs.",fare)
    elif mode=="train" or mode=="TRAIN":
        fare=0.5*train*dis
        print("The total cost of the rip is: Rs.",fare)
    elif mode=="flight" or mode=="FLIGHT":
        fare=0.5*flight*dis
        print("The total cost of the tripi is: Rs.",fare)
    else:
        print("Wrong input for mode of travel")

elif age>=65:
    print("You got 30% discount on your trip.....")
    if mode=="car" or mode=="CAR":
        fare=0.7*car*dis
        print("The total cost of the trip is: Rs.",fare)
    elif mode=="train" or mode=="TRAIN":
        fare=0.7*train*dis
        print("The total cost of the rip is: Rs.",fare)
    elif mode=="flight" or mode=="FLIGHT":
        fare=0.7*flight*dis
        print("The total cost of the tripi is: Rs.",fare)
    else:
        print("Wrong input for mode of travel")

elif age>12 and age<64:
    print("NO DISCOUNT....")
    if mode=="car" or mode=="CAR":
        fare=car*dis
        print("The total cost of the trip is: Rs.",fare)
    elif mode=="train" or mode=="TRAIN":
```

```
        fare=train*dis
        print("The total cost of the rip is: Rs.",fare)
    elif mode=="flight" or mode=="FLIGHT":
        fare=flight*dis
        print("The total cost of the tripi is: Rs.",fare)
    else:
        print("Wrong input for mode of travel")
else:
    print("Enter valid age")
```

Output:

```
================= RESTART: C:/Users/Yatharth Gupta
Welcome to the Trip planner by Pycharmers...
Enter the total distance travelled:20
Enter mode of travelling:train
Enter the age of passenger:65
You got 30% discount on your trip.....
The total cost of the rip is: Rs. 16.8
```

Algorithm:

Step-1: Start

Step-2: Define Constraints as: 1. Cost of per km by car is Rs. 0.8

2. Cost of per km by train is Rs. 1.2

3. Cost of per km by flight is Rs. 5

Step-3: Input Total distance travelled, Mode of travel and Age of Passenger.

Step-4: If age<=5, Give free of cost trip.

If age >5 and age<=12, give 50% discount on whole trip.

If age >12 and age<=64, no discount for the trip.

If age >=65, give 30% discount on whole trip.

Step-5: Display the Total fare of the trip with discount applied discount.

Step-6: End.

The difference between both codes

- In C, input for the mode of transport is taken as “char” while in Python, the input for mode of transport is already defined as string data type

- To take input, we are use scanf function in C while in Python, we use input function

- Printf statement Is used for C to display output in C whereas in Python, only print is used

- “ ; ” is vital in C while in python, indentation is valid

- In C, we need to declare the variable first whereas in python, you can declare the variables in the code itself

- Header file is used in C i.e. #include <stdio.h> whereas in python, it is predefined

CONCLUSION

By working on our problem using both C and Python, we have gained an understanding that each programming language comes with its own set of advantages and disadvantages. The choice of language ultimately depends on the user's comfort, the problem's requirements, and the specific context of application. We are glad to have explored these differences and are happy to present our findings to the class. Thank you!

CONTRIBUTION

Team name: PyCharmers

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Yatharth Gupta

- Programmed the Code in Python.
- Verified the Output.
- Executed and Explained the code while presenting.

Pratyush Srivastava

- Programmed the Code in C.
- Verified the Output.
- Executed and Explained the code while presenting.
- Contributed in forming the Report.

Sarim Khan

- Pointed out the differences between the two programs i.e. C and Python (Python).
- Initiated the Presentation.
- Contributed in forming the Report.
- Content writing for the Powerpoint Presentation.

Shubham Pradhan

- Pointed out the differences between the two programs i.e. C and Python .
- Contributed in Making the Powerpoint Presentation.
- Explained the Problem Statement.

Aniket Autit

- Pointed out the general differences between C and Python.
- Contributed in Making the Powerpoint Presentation (Conclusion)
- Contributed in forming the Report.