10/16/2022

PF Lab
Assignment

Lab 07

Abdullah Shafiq

22K-4489

Task # 01

You are responsible for the logistics of various types of cargo. Depending on the weight of each cargo, you need a different vehicle, and this will cost a different price per ton:

Up to 3 tons – a minibus ($200 per ton).

From over 3 and up to 11 tons – truck ($175 per ton).

Over 11 tons – train ($120 per ton).

Your task is to calculate the average price per ton of the cargo, and also what percentage of the cargo is transported in each vehicle.

PROGRAM &OUTPUT

```c
#include<stdio.h>
int main()
{
    int n,i;
    float minibus,train,truck,Avg,tc,c,price;

    printf("Enter How many seperate tons you will give: ");
    scanf("%d",&n);
    for(i=1;i<=n;i++)
    {
        printf("Enter weight of the Cargo:");
        scanf("%f",&c);
        tc=c+tc;
        if(c<=3)
        {
            price=price+(200*c);
            minibus=minibus+c;
        }
        else if((3<c)&&(11>=c))
        {
            price=price+(175*c);
            truck=truck+c;
        }
        else if (c>11)
        {
            price=price+(120*c);
            train=train+c;
        }
        else if (c>11)
        {
            price=price+(120*c);
            train=train+c;
        }
    }
    Avg=price/tc;
    printf("Total price:%.1f\n",price);
    printf("Sum of all cargo is:0 %f\n",tc);
    printf("The average price per ton of the cargo is %.1f\n",Avg);
    printf("Percentage weight carried by minibus:%.1f\n ",(minibus/tc)*100);
    printf("Percentage weight carried by truck:%.1f\n ",(truck/tc)*100);
    printf("Percentage weight carried by train:%.1f\n ",(train/tc)*100);
    printf("minibus transports :%.1f\n",minibus);
    printf("truck transports :%.1f\n",truck);
    printf("train transports :%.1f\n",train);
}
```

```
Enter How many seperate tons you will give: 4
Enter weight of the Cargo:1
Enter weight of the Cargo:5
Enter weight of the Cargo:16
Enter weight of the Cargo:3
Total price:3595.0
Sum of all cargo is:0 25.000000
The average price per ton of the cargo is 143.8
Percentage weight carried by minibus:16.0
 Percentage weight carried by truck:20.0
 Percentage weight carried by train:64.0
 minibus transports :4.0
truck transports :5.0
train transports :16.0

--------------------------------
```
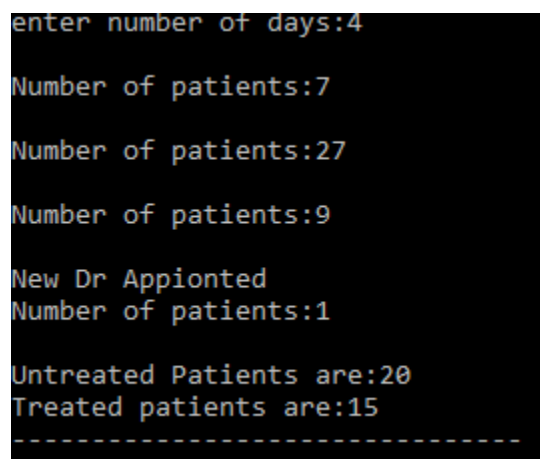
Task # 02

For a certain period of time, patients arrive at the hospital every day for an examination. It has initially 7 doctors. Each doctor can treat only one patient per day, but sometimes there is a shortage of doctors, so the remaining patients are sent to other hospitals. Every third day the hospital makes calculations and if the count of untreated patients is greater than the count of treated ones, another doctor is appointed.
Write a program, that calculates for a given period of time, the count of treated and untreated patients.

PROGRAM &OUTPUT

```c
#include<stdio.h>
int main()
{
    int i,days,up1=0,up=0,tp1=0,tp2=0,tp3=0,np,tp=0,x;
    printf("enter number of days:");
    scanf("%d",&days);
    for (i=1;i<=days;i++)
    {
        printf("\nNumber of patients:");
        scanf("%d",&np);
        if (i==3)
        {
            if(tp<up)
            {
                printf("\nNew Dr Appionted");
            }
        }
        else if(np>7)
        {
            up=np-7;
            up1=up1+up;
            tp1=tp1+7;
            /*printf("untreated \n%d",up);*/
        }
        else if (np==7)
        {
            tp2=tp2+7;
            /*printf("treated %d",tp);*/
        }
        else if(np<7)
        {
            tp3=tp3+np;
            /*printf("treated%d",tp3);*/
        }
    printf("\nUntreated Patients are:%d",up1);
    printf("\nTreated patients are:%d",tp=tp1+tp2+tp3);
    }
```

```
enter number of days:4

Number of patients:7

Number of patients:27

Number of patients:9

New Dr Appionted
Number of patients:1

Untreated Patients are:20
Treated patients are:15
------------------------------
```

Task # 03

Sara is N years old. For each birthday she receives a present. For each odd birthday (1, 3, 5, ..., n) she receives toys, and for each even birthday (2, 4, 6, ..., n) she receives money. For her second birthday she received Rs. 100, and the amount is increased by Rs 200 for each following even birthday. Over the years Sara has secretly saved her money. Sara's brother, in the years when she received money, took Rs. 30 from each of the amounts. Sara has sold the toys, received over the years, each one for Rs. 130 USD and added the sum to the amount of saved money. With the money she wanted to buy a washing machine for Rs 10,000. Write a program that calculates how much money she has saved and if it is enough to buy a washing machine.

PROGRAM &OUTPUT

```c
#include <stdio.h>
int main()
{
    int i,age,evenyear,oddyear,money=0,sold=0,total,a;
    printf("Enter Age:");
    scanf("%d",&age);
    for (i=1;i<=age;i++)
    {
        if (i%2==0)
        {
            money=money+200;
            money=money-30;
            printf("\nMoney Saved:%d",money);
        }
        else
        {
            sold=sold+130;
            printf("\n\ttoys Sold:%d",sold);
        }
    }
    total=money+sold;
    printf("Total money Saved:%d",total);
    if (total>=10000)
    {
        printf("\nYou can buy Washing machine");
    }
    else
    {
        printf("\nYou can not buy washing machine");
    }

}
```

```
Enter Age:18

Total money Saved:2700
You can not buy washing machine
------------------------------
```

Task # 04

We have n integer numbers within the range of [1 ... 1000]. Some percent of them p1 are under 200, another percent p2 are from 200 to 399, percent p3 are from 400 to 599, percent p4 are from 600 to 799 and the rest p5 percent are from 800 upwards. Write a program that calculates and prints the percentages p1, p2, p3, p4 and p5.

PROGRAM &OUTPUT

```c
#include <stdio.h>
int main()
{
    int num,i;
    float p1=0,p2=0,p3=0,p4=0,p5=0;

    int a;
    printf("\nhow many Numbers you will enter: ");
    scanf("%d",&num);

    for (i=0;i<num;i++)
    {
        printf("\nEnter Numbers: ");
        scanf("%d",&a);
        if (a<200)
        {
            p1=p1+1;

        }
        else if ((a>=200)&&(a<=399))
        {
            p2=p2+1;
        }
        else if ((a>=400)&&(a<=599))
        {
            p3=p3+1;
        }
        else if ((a>=600)&&(a<=799))
        {
            p4=p4+1;
        }
        else if (a>800)
        {
            p5=p5+1;
        }
    }
    float per1,per2,per3,per4,per5;
    per1=p1/num*100;
    per2=p2/num*100;
    per3=p3/num*100;
    per4=p4/num*100;
    per5=p5/num*100;
    printf("\npercentage of integer in p1:%.1f",per1);
    printf("\npercentage of integer in p2:%.1f",per2);
    printf("\npercentage of integer in p3:%.1f",per3);
    printf("\npercentage of integer in p4:%.1f",per4);
    printf("\npercentage of integer in p5:%.1f",per5);
}
```

```
how many Numbers you will enter: 7

Enter Numbers: 800

Enter Numbers: 801

Enter Numbers: 250

Enter Numbers: 199

Enter Numbers: 399

Enter Numbers: 599

Enter Numbers: 799

percentage of integer in p1:14.3
percentage of integer in p2:28.6
percentage of integer in p3:14.3
percentage of integer in p4:14.3
percentage of integer in p5:14.3
--------------------------------
```

Task # 05

The factorial of n (written n!) is the product of the integers between 1 and n. Thus 4! = 1*2*3*4 = 24 or 4! = 4*3*2*1 = 24. By definition, 0! = 1. Factorial is not defined for negative numbers. Write a program that asks the user for a non-negative integer and computes and prints the factorial of that integer. You will need to perform the following tasks.
1. Your program should check to see if the user entered a negative number. If so, the program should print a message saying that a nonnegative number is required and ask the user the enter another number. The program should keep doing this until the user enters a nonnegative number, after which it should compute the factorial of that number
2. You can use any loop you like to calculate the factorial.
3. Your program should also check what should happen if the user enters 0.
4. Your output should be in the following format.

PROGRAM &OUTPUT

```c
#include<stdio.h>
int main()
{
    int i;
    int x=1;
    int n;
    printf("Enter a number to find factorial: ");
    scanf("%d",&n);
    if (n>0)
    {
        for(i=1;i<=n;i++)
        {
            x=x*i;
        }
        printf("Factorial of %d is: %d",n,x);
    }
    else if (n<=0)
    {
        printf("enter non negative number");
    }
}
```

```
Enter a number to find factorial: 7
Factorial of 7 is: 5040
------------------------------
```

Task # 06

Ali is 18 years old and receives an inheritance that consists of Rs. 2,00,000. He decides to return Rs. 1,00,000, but does not know if the left money will be enough to live without working for 5 years. Write a program that calculates if Ali will have enough money to not have to work for 5 years. Assuming that for every even year he will spends Rs. 25,563. For every odd year he spends (even year + 12,580).

PROGRAM &OUTPUT

```c
#include <stdio.h>
int main()
{
    int spendeven,spendodd,totalmoney,leftmoney,i;
    int age =18;
    for (i=0;i<5;i++)
    {
        if (age%2==0)
        {
            spendeven=spendeven+25563;
            printf("\neven%d",spendeven);
        }
        else
        {
            spendodd=spendeven+12580;
            printf("\nodd%d",spendodd);
        }
        age=age+1;

        totalmoney=spendeven+spendodd;
        leftmoney=100000-totalmoney;
        printf("\n%d",totalmoney);
        printf("\n%d",leftmoney);
    }
}
```
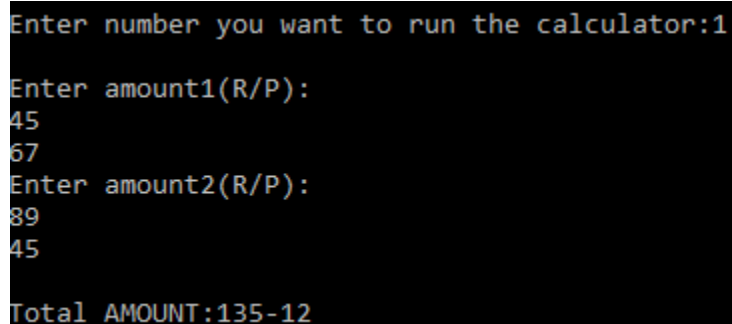
```
Age:18
Total Money: 140395
Left Money: -40395
-------------------------------
```

Task # 07

Write a program that repeatedly asks the user to enter two money amounts expressed in Rupees and Paisas. The program should then add the two amounts and display the answer, again in Rupees and Paisas. Use a do while loop that asks the user whether the program should be terminated.

PROGRAM &OUTPUT

```c
#include <stdio.h>
int main()
{
    int i,age,evenyear,oddyear,money=0,sold=0,total,a;
    printf("Enter Age:");
    scanf("%d",&age);
    for (i=1;i<=age;i++)
    {
        if (i%2==0)
        {
            money=money+200;
            money=money-30;
        }
        else
        {
            sold=sold+130;
        }
    }
    total=money+sold;
    printf("\nTotal money Saved:%d",total);
    if (total>=10000)
    {
        printf("\nYou can buy Washing machine");
    }
    else
    {
        printf("\nYou can not buy washing machine");
    }
}
```

```
Enter number you want to run the calculator:1

Enter amount1(R/P):
45
67
Enter amount2(R/P):
89
45

Total AMOUNT:135-12
------------------------------
```
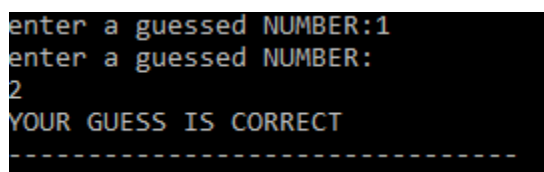
Task # 08

File Guess.c below contains a skeleton for a program to play a guessing game with the user. The program randomly generates an integer between 1 and 10, then ask the user to try to guess the number. If the user guesses incorrectly, the program should ask them to try again until the guess is correct; when the guess is correct, the program should print a congratulatory message.

1. Using the comments as a guide, complete the program so that it plays the game as described above.

2. Modify the program so that if the guess is wrong, the program says whether it is too high or too low. You will need an if statement (inside your loop) to do this.

3. Now add code to count how many guesses is remaining to the user to get the number, and print this number at the end with the congratulatory message. (You can give user 3 chances to guess)

4. Finally, count how many of the guesses are too high and how many are too low. Print these values, along with the total number of guesses, when the user finally guesses correctly.

PROGRAM &OUTPUT

```c
#include <stdio.h>
int main()
{
    int numtoguess;
    int guess;
    int i=0;
    numtoguess= rand() %10+1;
    printf("enter a guessed NUMBER:");
    scanf("%d",&guess);
    while(i<=guess)
    {
        if (guess==numtoguess)
        {
        printf("YOUR GUESS IS CORRECT");
        break;
        }
        else if(guess!=numtoguess)
        {
          printf("enter a guessed NUMBER:\n");
         scanf("%d",&guess);
        }
    i++;
    }
}
```

```
enter a guessed NUMBER:1
enter a guessed NUMBER:
2
YOUR GUESS IS CORRECT
------------------------------
```

Task # 09

It's almost election day and the election officials need a program to help tally election results. There are two candidates for office — Candidate A and Candidate B. The program's job is to take as input the number of votes each candidate received in each voting district and find the total number of votes for each. The program should print out the final tally for each candidate — both the total number of votes each received and the percent of votes each received. You should perform the following tasks;

1. Add the code to control the loop. You may use either a while loop or a do...while loop. The loop must be controlled by asking the user whether or not there are more districts to report (Consider there are 7 districts (D1, D2, D3, D4, D5, D6, D7) in which the elections are being held). The user should answer with the character y or n though your program should also allow uppercase responses.

2. Add the code to read in the votes for each candidate and find the total votes. Print out the total number of votes from all districts and the percentages.

3. Also display the number of votes both candidates got from each districts with percentages.

4. The election officials want more information. They want to know how many districts each candidate won. Add code to compute and print this. You need three new variables: one to count the number of districts won by Candidate A, one to count the number won by Candidate B, and one to count the number of ties.

PROGRAM &OUTPUT

```c
#include <stdio.h>
int main()
{
    int voteA1=0,voteB1=0,voteA2=0,voteB2=0,voteA3=0,voteB3=0,voteA4=0,voteB4=0,voteA5=0,voteB5=0,voteA6=0,voteB6=0,voteA7=0,voteB7=0;
    int D,i,district;
    printf("In which district you want to cast A vote:\n");
    scanf("%d",&district);
    switch (district)
    {

        case 1:
            {
                printf("\t\t*****DISTRICT 1*****\n");
                for (i=0;i<4;i++)
                {
                    printf("\nOn Which candidate you want to cast vote:(A/B)\n");
                    char v;
                    scanf("\n%c",&v);
                    if (v=='A')
                    {
                        voteA1=voteA1+1;
                    }
                    else if (v=='B')
                    {
                        voteB1=voteB1+1;
                    }
                }
                printf("\n\nTotal vote casted in D1: 4\n");
                printf("Candidate A : %d\ncandidate B : %d",voteA1,voteB1);
                printf("\n\n\t***CASTING OF D1 HAS BEEN ENDED***");
                printf("\n\n\t----------------------------------\n\n");
                printf("In which district you want to cast A vote:\n");
                scanf("%d",&district);
            }
```

```c
        case 2:
            {
                printf("\t\t*****DISTRICT 2*****\n");
                for (i=0;i<4;i++)
                {
                    printf("\nOn Which candidate you want to cast vote:(A/B)\n");
                    char v;
                    scanf("\n%c",&v);
                    if (v=='A')
                    {
                        voteA2=voteA2+1;
                        printf("%d",voteA2);
                    }
                    else if (v=='B')
                    {
                        voteB2=voteB2+1;
                        printf("Vote of candidate B : %d",voteB2);
                    }
                }
                printf("\n\nTotal vote casted in D2: 4\n");
                printf("Candidate A : %d\ncandidate B : %d",voteA2,voteB2);
                printf("\n\n\t***CASTING OF D2 HAS BEEN ENDED***");
                printf("\n\n\t-----------------------------------\n\n");
                printf("In which district you want to cast A vote:\n");
                scanf("%d",&district);
            }
        case 3:
            {
                printf("\t\t*****DISTRICT 3*****\n");
                for (i=0;i<4;i++)
                {
                    printf("\nOn Which candidate you want to cast vote:(A/B)\n");
                    char v;
                    scanf("\n%c",&v);
                    if (v=='A')
                    {
                        voteA3=voteA3+1;
                        printf("%d",voteA3);
                    }
                    else if (v=='B')
                    {
                        voteB3=voteB3+1;
                        printf("Vote of candidate B : %d",voteB3);
                    }
                }
                printf("\n\nTotal vote casted in D3: 4\n");
                printf("Candidate A : %d\ncandidate B : %d",voteA3,voteB3);
                printf("\n\n\t***CASTING OF D3 HAS BEEN ENDED***");
                printf("\n\n\t-----------------------------------\n\n");
                printf("In which district you want to cast A vote:\n");
                scanf("%d",&district);
            }
```

```c
case 4:
    {
        printf("\t\t*****DISTRICT 4*****\n");
        for (i=0;i<4;i++)
        {
            printf("\nOn Which candidate you want to cast vote:(A/B)\n");
            char v;
            scanf("\n%c",&v);
            if (v=='A')
            {
                voteA4=voteA4+1;
                printf("%d",voteA4);
            }
            else if (v=='B')
            {
                voteB4=voteB4+1;
                printf("Vote of candidate B : %d",voteB4);
            }
        }
        printf("\n\nTotal vote casted in D4: 4\n");
        printf("Candidate A : %d\ncandidate B : %d",voteA4,voteB4);
        printf("\n\n\t***CASTING OF D4 HAS BEEN ENDED***");
        printf("\n\n\t----------------------------------\n\n");
        printf("In which district you want to cast A vote:\n");
        scanf("%d",&district);
    }
case 5:
    {
        printf("\t\t*****DISTRICT 5*****\n");
        for (i=0;i<4;i++)
        {
            printf("\nOn Which candidate you want to cast vote:(A/B)\n");
            char v;
            scanf("\n%c",&v);
            if (v=='A')
            {
                voteA5=voteA5+1;
                printf("%d",voteA5);
            }
            else if (v=='B')
            {
                voteB5=voteB5+1;
                printf("Vote of candidate B : %d",voteB5);
            }
        }
        printf("\n\nTotal vote casted in D5: 4\n");
        printf("Candidate A : %d\ncandidate B : %d",voteA5,voteB5);
        printf("\n\n\t***CASTING OF D5 HAS BEEN ENDED***");
        printf("\n\n\t----------------------------------\n\n");
        printf("In which district you want to cast A vote:\n");
        scanf("%d",&district);
    }
```

```c
case 6:
    {
        printf("\t\t*****DISTRICT 6*****\n");
        for (i=0;i<4;i++)
        {
            printf("\nOn Which candidate you want to cast vote:(A/B)\n");
            char v;
            scanf("\n%c",&v);
            if (v=='A')
            {
                voteA6=voteA6+1;
                printf("%d",voteA6);
            }
            else if (v=='B')
            {
                voteB6=voteB6+1;
                printf("Vote of candidate B : %d",voteB6);
            }
        }
        printf("\n\nTotal vote casted in D6: 4\n");
        printf("Candidate A : %d\ncandidate B : %d",voteA6,voteB6);
        printf("\n\n\t***CASTING OF D6 HAS BEEN ENDED***");
        printf("\n\n\t-----------------------------------\n\n");
        printf("In which district you want to cast A vote:\n");
        scanf("%d",&district);
    }
case 7:
    {
        printf("\t\t*****DISTRICT 7*****\n");
        for (i=0;i<4;i++)
        {
            printf("\nOn Which candidate you want to cast vote:(A/B)\n");
            char v;
            scanf("\n%c",&v);
            if (v=='A')
            {
                voteA7=voteA7+1;
                printf("%d",voteA7);
            }
            else if (v=='B')
            {
                voteB7=voteB7+1;
                printf("Vote of candidate B : %d",voteB7);
            }
        }
        printf("\n\nTotal vote casted in D7: 4\n");
        printf("Candidate A : %d\ncandidate B : %d",voteA7,voteB7);
        printf("\n\n\t***CASTING OF D7 HAS BEEN ENDED***");
        printf("\n\n\t-----------------------------------\n\n");
    }
```

```c
}
int TVA=voteA1+voteA2+voteA3+voteA4+voteA5+voteA6+voteA7;
int TVB=voteB1+voteB2+voteB3+voteB4+voteB5+voteB6+voteB7;
printf("\nTotal Number of Votes of each candidate:\nCandidate A:%d\nCandidate B:%d",TVA,TVB);
float tc=28.0,fTVA,fTVB;
fTVA=TVA;
fTVB=TVB;
float pA,pB;
printf("\nPrcentage Of Vote:\n");
pA=(fTVA/tc)*100;
printf("Candidate A:%.1f",pA);
pB=(fTVB/tc)*100;
printf("\nCandidate B:%.1f",pB);
}
```

```
In which district you want to cast A vote:
1
          *****DISTRICT 1*****

On Which candidate you want to cast vote:(A/B)
A
On Which candidate you want to cast vote:(A/B)
A
On Which candidate you want to cast vote:(A/B)
B
On Which candidate you want to cast vote:(A/B)
B


Total vote casted in D1: 4
Candidate A : 2
candidate B : 2

       ***CASTING OF D1 HAS BEEN ENDED***

       -----------------------------------
```

```
In which district you want to cast A vote:
2
          *****DISTRICT 2*****

On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 1
On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 2
On Which candidate you want to cast vote:(A/B)
A
1
On Which candidate you want to cast vote:(A/B)
A
2

Total vote casted in D2: 4
Candidate A : 2
candidate B : 2

       ***CASTING OF D2 HAS BEEN ENDED***

       -----------------------------------
```

```
In which district you want to cast A vote:
3
          *****DISTRICT 3*****

On Which candidate you want to cast vote:(A/B)
A
1
On Which candidate you want to cast vote:(A/B)
A
2
On Which candidate you want to cast vote:(A/B)
A
3
On Which candidate you want to cast vote:(A/B)
A
4

Total vote casted in D3: 4
Candidate A : 4
candidate B : 0

       ***CASTING OF D3 HAS BEEN ENDED***

       -----------------------------------
```

```
In which district you want to cast A vote:
4
          *****DISTRICT 4*****

On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 1
On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 2
On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 3
On Which candidate you want to cast vote:(A/B)
A
1

Total vote casted in D4: 4
Candidate A : 1
candidate B : 3

       ***CASTING OF D4 HAS BEEN ENDED***

       -----------------------------------
```

```
In which district you want to cast A vote:
5
          *****DISTRICT 5*****

On Which candidate you want to cast vote:(A/B)
A
1
On Which candidate you want to cast vote:(A/B)
A
2
On Which candidate you want to cast vote:(A/B)
A
3
On Which candidate you want to cast vote:(A/B)
A
4

Total vote casted in D5: 4
Candidate A : 4
candidate B : 0

       ***CASTING OF D5 HAS BEEN ENDED***

       -----------------------------------
```

```
In which district you want to cast A vote:
6
          *****DISTRICT 6*****

On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 1
On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 2
On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 3
On Which candidate you want to cast vote:(A/B)
B
Vote of candidate B : 4

Total vote casted in D6: 4
Candidate A : 0
candidate B : 4

       ***CASTING OF D6 HAS BEEN ENDED***

       -----------------------------------
```

```
In which district you want to cast A vote:
7
          *****DISTRICT 7*****

On Which candidate you want to cast vote:(A/B)
A
1
On Which candidate you want to cast vote:(A/B)
A
2
On Which candidate you want to cast vote:(A/B)
A
3
On Which candidate you want to cast vote:(A/B)
A
4

Total vote casted in D7: 4
Candidate A : 4
candidate B : 0

       ***CASTING OF D7 HAS BEEN ENDED***

       -----------------------------------
```

```
Total Number of Votes of each candidate:
Candidate A:17
Candidate B:11
Prcentage Of Vote:
Candidate A:60.7
Candidate B:39.3
-------------------------------
```