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Assignment TP3

Problem1- Write a C program to get a number from a user. The program tells us whether this input number is a positive or a negative number.

INPUT:
    Enter a number: -100
OUTPUT:
    -100 is a negative number.

Code:

```c
#include<stdio.h>
int main(){

    int n;
    printf("Enter a number:"); scanf("%i", &n);

    if(n>0){
        printf("%i is a positive number.", n);
    }
    else if(n<0){
        printf("%i is a negative number", n);
    }
    else{
        printf("%i = 0", n);
    }
}
```

Result (1):

```
Enter a number:-100
-100 is a negative number
PS C:\Users\Vipha>
```

Result (2):

```
Enter a number:50
50 is a positive number.
PS C:\Users\Vipha>
```

Problem2- Write a C program to get a number from a user. The program tells us whether this input number is either one of the following categories below: A) negative and odd numbers, B) negative and even numbers, C) positive and odd numbers, and D) positive and even numbers.

INPUT:
Enter a number: 50
OUTPUT:
It is in the category D because it is a positive number and it is also an even number.

Code:

```c
1    #include<stdio.h>
2    #include<math.h>
3
4    int main(){
5
6        printf("Category A: negative and odd number.\n");
7        printf("Category B: negative and even number.\n");
8        printf("Category C: positive and odd number.\n");
9        printf("Category D: positive and even number.\n");
10
11       int n;
12       printf("Input a number:"); scanf("%i", &n);
13
14       if(n<0 && n%2==-1){
15           printf("%i is in category A because %i is negative and odd number.", n, n);
16       }
17       else if(n<0 && n%2==0){
18           printf("%i is in categroy B because %i is negative and even number.", n, n);
19       }
20       else if(n>0 && n%2==1){
21           printf("%i is in category C because %i is positive and odd number.", n, n);
22       }
23       else if(n>0 && n%2==0){
24           printf("%i is in category D because %i is positive and even number.", n, n);
25       }
26
27   }
```

Result (1):

```
Category A: negative and odd number.
Category B: negative and even number.
Category C: positive and odd number.
Category D: positive and even number.
Input a number:-7
-7 is in category A because -7 is negative and odd number.

PS C:\Users\Vipha> ^C
PS C:\Users\Vipha>
```

Result (2):

```
Category A: negative and odd number.
Category B: negative and even number.
Category C: positive and odd number.
Category D: positive and even number.
Input a number:-10
-10 is in categroy B because -10 is negative and even number.
```

Result (3):

```
Category A: negative and odd number.
Category B: negative and even number.
Category C: positive and odd number.
Category D: positive and even number.
Input a number:9
9 is in category C because 9 is positive and odd number.
PS C:\Users\Vipha> ^C
```

Result (4):

```
Category A: negative and odd number.
Category B: negative and even number.
Category C: positive and odd number.
Category D: positive and even number.
Input a number:20
20 is in category D because 20 is positive and even number.
PS C:\Users\Vipha> 
```

Problem3- Write a C program to ask a user for 7 numbers (7 variables). Find the minimum number and display on screen.

INPUT:

Enter number #1: 2
Enter number #2: 99
Enter number #3: 1
Enter number #4: 2
Enter number #5: 9
Enter number #6: -7
Enter number #7: 5

OUTPUT:

The minimum number is -7.

Code:

```c
1    #include<stdio.h>
2    int main(){
3
4        int a,b,c,d,e,f,g;
5        printf("Input first value:"); scanf("%i", &a);
6        printf("Input second value:"); scanf("%i", &b);
7        printf("Input third value:"); scanf("%i", &c);
8        printf("Input fourth value:"); scanf("%i", &d);
9        printf("Input fifth value:"); scanf("%i", &e);
10       printf("Input sixth value:"); scanf("%i", &f);
11       printf("Input seventh value:"); scanf("%i", &g);
12
13       if(a<=b && a<=c && a<=d && a<=e && a<=f && a<=g){
14           printf("Minimium number is %i", a);
15       }
16       else if(b<=a && b<=c && b<=d && b<=e && b<=f && b<=g){
17           printf("Minimium number is %i", b);
18       }
19       else if(c<=a && c<=b && c<=d && c<=e && c<=f && c<=g){
20           printf("Minimium number is %i", c);
21       }
22       else if(d<=a && d<=b && d<=c && d<=e && d<=f && d<=g){
23           printf("Minimium number is %i", d);
24       }
25       else if(e<=a && e<=b && e<=c && e<=d && e<=f && e<=g){
26           printf("Minimium number is %i", e);
27       }
28       else if(f<=a && f<=b && f<=c && f<=d && f<=e && f<=g){
29           printf("Minimium number is %i", f);
30       }
31       else if(g<=a && g<=b && g<=c && g<=d && g<=e && g<=f){
32           printf("Minimium number is %i", g);
33       }
34
35   }
```

Result:

```
Input first value:2
Input second value:99
Input third value:1
Input fourth value:2
Input fifth value:9
Input sixth value:-7
Input seventh value:5
Minimium number is -7
PS C:\Users\Vipha> 
```

Problem4- Write a C program to ask a user for 10 numbers (10 variables). What are the max and min numbers among these 10 numbers?

INPUT:

Enter number #1:	10
Enter number #2:	15
Enter number #3:	33
Enter number #4:	5
Enter number #5:	0
Enter number #6:	45
Enter number #7:	2
Enter number #8:	4
Enter number #9:	6
Enter number #10:	8

OUTPUT:

Among these 10 numbers (10, 15, 33, 5, 0, 45, 2, 4, 6, 8), the max is 45 and the min is 0.

Code:

```c
#include<stdio.h>
#include<math.h>
int main(){
    int a, b, c, d, e, f, g, h, i, j;
    printf("enter the value of 1st number:"); scanf("%i", &a);
    printf("enter the value of 2nd number:"); scanf("%i", &b);
    printf("enter the value of 3rd number:"); scanf("%i", &c);
    printf("enter the value of 4th number:"); scanf("%i", &d);
    printf("enter the value of 5th number:"); scanf("%i", &e);
    printf("enter the value of 6th number:"); scanf("%i", &f);
    printf("enter the value of 7th number:"); scanf("%i", &g);
    printf("enter the value of 8th number:"); scanf("%i", &h);
    printf("enter the value of 9th number:"); scanf("%i", &i);
    printf("enter the value of 10th number:"); scanf("%i", &j);

    printf("Among this 10 numbers(%i,%i,%i,%i,%i,%i,%i,%i,%i,%i)\n", a, b, c, d, e, f, g, h, i, j);
    //mini part
    if(a<=b && a<=c && a<=d && a<=e && a<=f && a<=g && a<=h && a<=i && a<=j){
        printf("Minimium number is %i\n", a);
    }
    else if(b<=a && b<=c && b<=d && b<=e && b<=f && b<=g && b<=h && b<=i && b<=j){
        printf("Minimium number is %i\n", b);
    }
    else if(c<=a && c<=b && c<=d && c<=e && c<=f && c<=g && c<=h && c<=i && c<=j){
        printf("Minimium number is %i\n", c);
    }
    else if(d<=a && d<=b && d<=c && d<=e && d<=f && d<=g && d<=h && d<=i && d<=j){
        printf("Minimium number is %i\n", d);
    }
    else if(e<=a && e<=b && e<=c && e<=d && e<=f && e<=g && e<=h && e<=i && e<=j){
        printf("Minimium number is %i\n", e);
    }
    else if(f<=a && f<=b && f<=c && f<=d && f<=e && f<=g && f<=h && f<=i && f<=j){
        printf("Minimium number is %i\n", f);
    }
```

```c
36          else if(g<=a && g<=b && g<=c && g<=d && g<=e && g<=f && g<=h && g<=i && g<=j){
37              printf("Minimium number is %i\n", g);
38          }
39          else if(h<=a && h<=b && h<=d && h<=e && h<=f && h<=g && h<=c && h<=i && h<=j){
40              printf("Minimium number is %i\n", h);
41          }
42          else if(i<=a && i<=c && i<=d && i<=e && i<=f && i<=g && i<=h && i<=b && i<=j){
43              printf("Minimium number is %i\n", i);
44          }
45          else if(j<=a && j<=c && j<=d && j<=e && j<=f && j<=g && j<=h && j<=i && j<=b){
46              printf("Minimium number is %i\n", j);
47          }
48          //max part
49          if(a>=b && a>=c && a>=d && a>=e && a>=f && a>=g && a>=h && a>=i && a>=j){
50              printf("Maximium number is %i\n", a);
51          }
52          else if(b>=a && b>=c && b>=d && b>=e && b>=f && b>=g && b>=h && b>=i && b>=j){
53              printf("Maximium number is %i\n", b);
54          }
55          else if(c>=a && c>=b && c>=d && c>=e && c>=f && c>=g && c>=h && c>=i && c>=j){
56              printf("Maximium number is %i\n", c);
57          }
58          else if(d>=a && d>=c && d>=b && d>=e && d>=f && d>=g && d>=h && d>=i && d>=j){
59              printf("Maximium number is %i\n", d);
60          }
61          else if(e>=a && e>=b && e>=d && e>=c && e>=f && e>=g && e>=h && e>=i && e>=j){
62              printf("Maximium number is %i\n", e);
63          }
64          else if(f>=a && f>=c && f>=d && f>=e && f>=b && f>=g && f>=h && f>=i && f>=j){
65              printf("Maximium number is %i\n", f);
66          }
67          else if(g>=a && g>=c && g>=d && g>=e && g>=f && g>=b && g>=h && g>=i && g>=j){
68              printf("Maximium number is %i\n", g);
69          }
70          else if(h>=a && h>=c && h>=d && h>=e && h>=f && h>=g && h>=b && h>=i && h>=j){
71              printf("Maximium number is %i\n", h);
72          }
73          else if(i>=a && i>=c && i>=d && i>=e && i>=f && i>=g && i>=h && i>=b && i>=i){
74              printf("Maximium number is %i\n", i);
75          }
76          else if(j>=a && j>=c && j>=d && j>=e && j>=f && j>=g && j>=h && j>=i && j>=b){
77              printf("Maximium number is %i\n", j);
78          }
79  }
```

Result:

```
enter the value of 1st number:10
enter the value of 2nd number:15
enter the value of 3rd number:33
enter the value of 4th number:5
enter the value of 5th number:0
enter the value of 6th number:45
enter the value of 7th number:2
enter the value of 8th number:4
enter the value of 9th number:6
enter the value of 10th number:8
Among this 10 numbers(10,15,33,5,0,45,2,4,6,8)
Minimium number is 0
Maximium number is 45
PS C:\Users\Vipha> |
```

Problem5- Write a C program to solve the quadratic equation. $ax^2 + bx + c = 0$.
Ask a user to input the coefficients a, b and c. The program calculates delta and find roots of the
equation. Display the result (roots of the equation) on screen.

      INPUT:

            Input a: 1
            Input b: 4
            Input c: 3
      OUTPUT:

            The delta value of this equation equals 4.
            So this equation has two roots: $x_1 = -1$ and $x_2 = -3$

Code:

```c
1    #include<stdio.h>
2    #include<math.h>
3
4    int main (){
5        printf("solving Equadratic equation\n");
6        float a,b,c;
7        printf("Input coefficient a:"); scanf("%f", &a);
8        printf("Input coefficient b:"); scanf("%f", &b);
9        printf("Input coefficient c:"); scanf("%f", &c);
10
11       float delta=pow(b,2)-4*a*c;
12       if(delta==0){
13           float X1=-b/2.0*a;
14           float X2=-b/2.0*a;
15           printf("The roots of the equation are X1=%.2f and X2=%.2f", X1, X2);
16       }
```

```
17        else if(delta>0){
18            float X1=(-b-sqrt(delta))/2.0*a;
19            float X2=(-b+sqrt(delta))/2.0*a;
20            printf("The roots of the equation are X1=%.2f and X2=%.2f", X1, X2);
21        }
22        else{
23            printf("The roots of the equation aren't the real number.");
24        }
25
26    }
```

Result:

```
solving Equadratic equation
Input coefficient a:1
Input coefficient b:4
Input coefficient c:3
The roots of the equation are X1=-3.00 and X2=-1.00

PS C:\Users\Vipha> ^C
PS C:\Users\Vipha>
```

Problem6- Write a C program to tell how much tax a person should pay based on his/her salary and gender. The program ask a user for gender, name, and salary (US dollar). The tax is computed according to the following rules:
-pay tax 10%, for male and his salary is more than 400 USD.
-pay tax 5%, for male and his salary is from 200 USD to 400 USD.
-pay tax 5%, for females and her salary is more than 500 USD.
-pay tax 3%, for females and her salary is from 250 USD to 500 USD.
-Otherwise, no need to pay tax.

INPUT:
Enter gender: F
What is your name?: Sokha
Your salary in USD: 450
Output:
Hi Dara, based on your given information, the tax salary that
You need to pay: 13.5 USD.

Code:

```
1    #include<stdio.h>
2    #include<math.h>
3    int main(){
4
5        char name[15];
6        char gender;
7        int salary;
8
```

```
9        printf("The program will tell you about tax you will pay base on your salary and gender.\n");
10       printf("Enter your name:"); scanf("%s", &name);
11       printf("Enter your gender:"); scanf("%s", &gender);
12       printf("Enter your salary:"); scanf("%i", &salary);
13
14       if((gender=='m'|| gender=="M") && salary>400){
15           float tax1=salary*0.1;
16           printf("The tax you will pay is %f$", tax1);
17       }
18       else if((gender=='m' || gender=='M') && salary>=200 && salary<=400){
19           float tax2=salary*0.05;
20           printf("The tax you will pay is %f$", tax2);
21       }
22       else if((gender=='f' || gender=='F') && salary>500){
23           float tax3=salary*0.05;
24           printf("The tax you will pay is %f$", tax3);
25       }
26       else if((gender=='f' || gender=='F') && salary>=250 && salary<=500){
27           float tax4=salary*0.03;
28           printf("The tax you will pay is %f$", tax4);
29       }
30       else{
31           printf("congratulation!! you don't have to pay tax.");
32       }
33
34  }
```

Result:

```
The program will tell you about tax you will pay base on your
salary and gender.
Enter your name:Sokha
Enter your gender:f
Enter your salary:450
The tax you will pay is 13.500000$
PS C:\Users\Vipha>
```

Problem7- Write a C program to compute the average score of a student over 3 subjects Math,
English and Computer. Then tell which grade this student could get. The grading is based on
the following rules:

Average score:	Grade
86 - 100	A
81 - 85	B
70 - 80	C
61 - 69	D
50 - 60	E
Below 50	F

INPUT:
    Math score: 75.5
    English score: 90
    Language score: 85.5
Output:
    Average score is: 83.66
    This student gets grade B.

Code:

```c
#include<stdio.h>
#include<math.h>
int main(){

    float math, english, language;
    printf("Enter your Math score:"); scanf("%f", &math);
    printf("Enter your English score:"); scanf("%f", &english);
    printf("Enter your Language score:"); scanf("%f", &language);

    float average=(math+english+language)/3;
    printf("Your average is %f\n", average);

    if(average>=86 && average<=100){
        printf("This student gets grade A.");
    }
    else if(average<86 && average>=81){
        printf("This student gets grade B.");
    }
    else if(average<81 && average>=70){
        printf("This students gets grade C.");
    }
    else if(average<70 && average>=61){
        printf("This student gets grade D.");
    }
    else if(average<61 && average>=60){
        printf("This student gets grade E.");
    }
    else{
        printf("This student gets grade F.");
    }

}
```

Result:

```
Enter your Math score:75.5
Enter your English score:90
Enter your Language score:85.5
Your average is 83.666664
This student gets grade B.
PS C:\Users\Vipha> |
```