

Institute of technology of Cambodia

Department of Information and communication Engineering



TP4-Decision marking

TP: Algorithm and Programming

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Problem1: Write a C program to get a number from a user.
The program check and tell whether this input number is positive or negative number.

---- > >=

A

```

Start here x P1.c x *P2.c x P3.c x
1  #include<stdio.h>
2
3  main()
4  {
5      float a;
6
7      printf("Enter number of a: ");
8      scanf("%f",&a);
9
10     if(a>0){
11         printf("The number is positive \n");
12     }
13     else{
14         printf("The number is nagativ \n");
15     }
16 }
17
"C:\Code C program\P1.exe"
Enter number of a: -7
The number is nagativ

Process returned 0 (0x0)   execution time : 5.114 s
Press any key to continue.

```

a

```

P1.c
1  #include<stdio.h>
2
3  main()
4  {
5      float a;
6
7      printf("Enter number of a: ");
8      scanf("%f",&a);
9
10     if(a>0){
11         printf("The number is positive \n");
12     }
13     else{
14         printf("The number is nagativ \n");
15     }
16 }

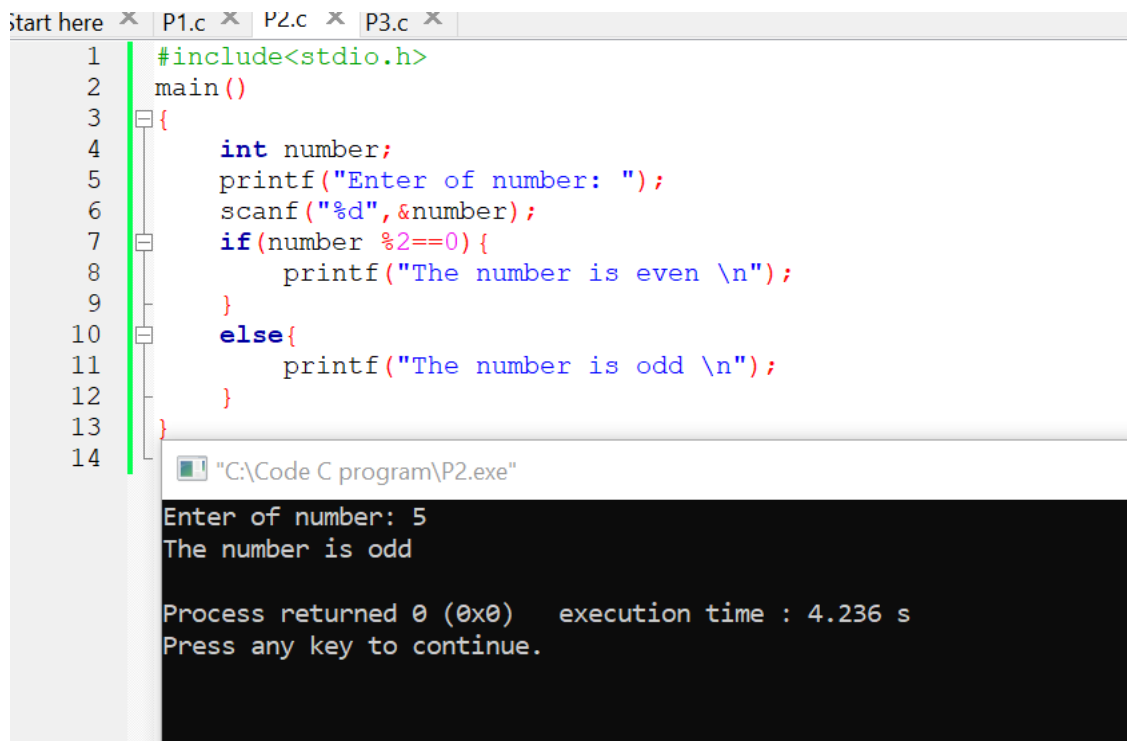
C:\Code C program\P1.exe
Enter number of a: 8
The number is positive

-----
Process exited after 6.155 seconds with return value 0
Press any key to continue . . .

```

Problem2- Write a C program to get a number from a user.
The program check and tell whether this input number is even or odd number.

---- % ==

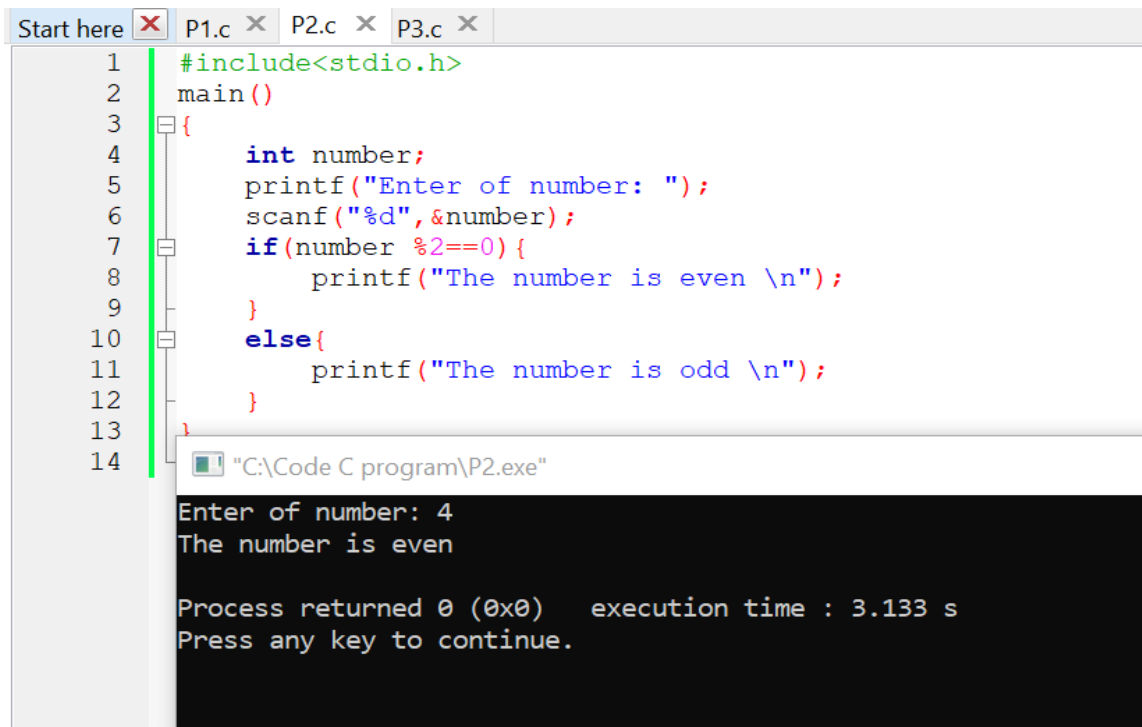


The screenshot shows a code editor with a file named P2.c. The code is as follows:

```
1 #include<stdio.h>
2 main()
3 {
4     int number;
5     printf("Enter of number: ");
6     scanf("%d", &number);
7     if(number %2==0) {
8         printf("The number is even \n");
9     }
10    else{
11        printf("The number is odd \n");
12    }
13 }
14
```

Below the code editor, a terminal window shows the execution of the program. It prompts for an input number, and the user enters 5. The program outputs "The number is odd". The terminal also shows the process returned 0 (0x0) and the execution time was 4.236 s.

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This screenshot is similar to the one above, but the user has entered the number 4. The code in the editor is identical. The terminal output shows "Enter of number: 4" followed by "The number is even". The process returned 0 (0x0) and the execution time was 3.133 s.

Problem3- Write a C program to ask a user for 7 numbers

(7 variables).

Find the minimum number and display on screen.

E.g

Input n1: 2

Input n2: 99

Input n3: 1

Input n4: 2

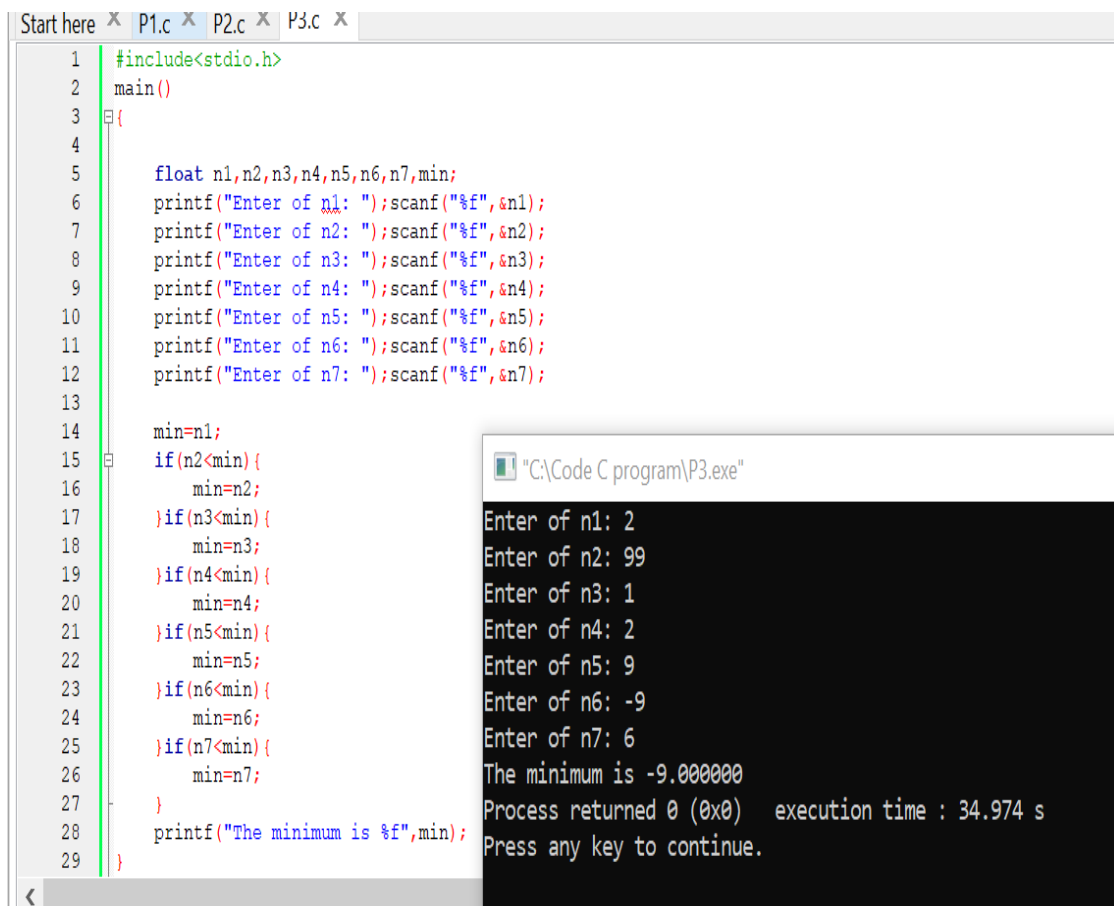
Input n5: 9

Input n6: -7

Input n7: 5

=> Output: The minimum number is -7

A



The image shows a C program in a code editor with tabs for 'Start here', 'P1.c', 'P2.c', and 'P3.c'. The code in 'P3.c' is as follows:

```
1 #include<stdio.h>
2 main()
3 {
4
5     float n1,n2,n3,n4,n5,n6,n7,min;
6     printf("Enter of n1: ");scanf("%f",&n1);
7     printf("Enter of n2: ");scanf("%f",&n2);
8     printf("Enter of n3: ");scanf("%f",&n3);
9     printf("Enter of n4: ");scanf("%f",&n4);
10    printf("Enter of n5: ");scanf("%f",&n5);
11    printf("Enter of n6: ");scanf("%f",&n6);
12    printf("Enter of n7: ");scanf("%f",&n7);
13
14    min=n1;
15    if(n2<min){
16        min=n2;
17    }if(n3<min){
18        min=n3;
19    }if(n4<min){
20        min=n4;
21    }if(n5<min){
22        min=n5;
23    }if(n6<min){
24        min=n6;
25    }if(n7<min){
26        min=n7;
27    }
28    printf("The minimum is %f",min);
29 }
```

Below the code editor is a terminal window titled '"C:\Code C program\P3.exe"'. It displays the following output:

```
Enter of n1: 2
Enter of n2: 99
Enter of n3: 1
Enter of n4: 2
Enter of n5: 9
Enter of n6: -9
Enter of n7: 6
The minimum is -9.000000
Process returned 0 (0x0)   execution time : 34.974 s
Press any key to continue.
```

Problem4- Write a C program to solve the quadratic equation $ax^2+bx+c=0$.

Ask a user to inputs the coefficient a, b and c. The program calculate delta and find roots of the equation.

Display the result (roots of the equation) on screen.

E.g:

Input a: 1

Input b: 4

Input c: 3

=> Output: The equation has roots: $x_1=-1$ and $x_2=-3$

Remark: Make sure you verify the result from program whether it is correct if we do it manually by hand.

a

```
1
2 #include<stdio.h>
3 #include<math.h>
4
5 main()
6 {
7     int a,b,c;
8     float x1,x2,delta,c1,c2;
9
10    printf("Value of a: ");scanf("%d",&a);
11    printf("Value of b: ");scanf("%d",&b);
12    printf("Value of c: ");scanf("%d",&c);
13
14    delta = b*b - 4*a*c;
15    if(delta==0){
16        x1 = (float) -b/(2*a);
17        x2 = x1;
18        printf("It has double roots x1=x2=%.2f\n",x1);
19    }
20    else if(delta>0){
21        x1 = (-b + sqrt(delta))/(2*a);
22        x2 = (-b - sqrt(delta))/(2*a);
23        printf(" the equation has two roots: x1=%.2f,x2=%.2f\n",x1,x2);
24    }
25    else if(delta<0){
26        c1 = (float)-b/(2*a);
27        c2 = sqrt(-delta)/(2*a);
28        printf("equation has two root as complex number.");
29        printf("x1=%.2f + %.2fi",c1,c2);
30        printf("x2=%.2f - %.2fi",c1,c2);
31    }
32
33 }
```

"C:\Code C program\P5.exe"

Value of a: 1
Value of b: 4
Value of c: 3
the equation has two roots: x1=-1.00,x2=-3.00

Process returned 0 (0x0) execution time : 8.910 s
Press any key to continue.

Problem5 - 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 based on the following rules:

- pay tax 10%, for male and salary is more than 300 USD.
- pay tax 5%, for male and salary is in between 200USD and 300 USD.
- pay tax 5%, for female and salary is more than 300 USD.
- pay tax 3%, for female and salary is in between 250 USD and 300USD.
- Otherwise, no need to pay tax.

```
gender=='M'  
gender=="Male"    if(strcmp(gender,"Male")==0)
```

E.g:

Input gender: F

Input name: Dara

Input salary (USD): 280

=> Output:

Hi Dara, based on your given information, the tax salary that you need to pay is: 8.4 USD.

Final salary to received is: $280 - 8.4 = 271.6$ \$

The image shows a screenshot of a C program being executed. On the left, the source code is visible in a text editor. It includes headers, variable declarations, and logic to calculate tax based on gender and salary. The code uses conditional statements to apply different tax rates (10%, 5%, 3%) based on the input. On the right, a terminal window shows the program's execution. It prompts the user for name, gender, and salary, and then displays the calculated tax and final salary.

```
1 #include<stdio.h>  
2 main()  
3 {  
4     char name[100];  
5     char gender;  
6     float salary, pay, final_salary;  
7  
8     printf("Enter your name: ");  
9     scanf("%s", &name);  
10    printf("Enter your gender: ");  
11    scanf("%c", &gender);  
12    scanf("%c", &gender);  
13    printf("Enter your salary(USD): ");  
14    scanf("%f", &salary);  
15  
16    if (salary>300 && gender=='M')  
17    {  
18        pay = (salary*10);  
19        final_salary=salary-pay;  
20        printf("Hi! %s, based on your given information, the tax salary that you need to pay: %.2f USD\n", name, pay);  
21        printf("Final salary to received is: %.2f - %.2f = %.2f USD\n", salary, pay, final_salary);  
22    }  
23    else if (salary>200 && salary>300 && gender=='M')  
24    {  
25        pay = (salary*5);  
26        final_salary=salary-pay;  
27        printf("Hi! %s, based on your given information, the tax salary that you need to pay: %.2f USD\n", name, pay);  
28        printf("Final salary to received is: %.2f - %.2f = %.2f USD\n", salary, pay, final_salary);  
29    }  
30    else if (salary>300 && gender=='F')  
31    {  
32        pay = (salary*5);  
33        final_salary=salary-pay;  
34        printf("Hi! %s, based on your given information, the tax salary that you need to pay: %.2f USD\n", name, pay);  
35        printf("Final salary to received is: %.2f - %.2f = %.2f USD\n", salary, pay, final_salary);  
36    }  
37    else if (salary>250 && salary>300 && gender=='F')  
38    {  
39        pay = (salary*3);  
40        final_salary=salary-pay;  
41        printf("Hi! %s, based on your given information, the tax salary that you need to pay: %.2f USD\n", name, pay);  
42        printf("Final salary to received is: %.2f - %.2f = %.2f USD\n", salary, pay, final_salary);  
43    }  
44    else  
45    {  
46        printf("Hi! %s, based on your given information, Your tax salary so need to pay: 0\n");  
47    }  
48 }  
49  
50
```

Terminal Output:

```
Select "C:\Code C program\P6.exe"  
Enter your name: Dara  
Enter your gender: F  
Enter your salary(usa): 280  
  
Hi Dara, based on your given information, the tax salary that you need to pay: 8.40 USA  
Final salary to received is: 280.0 - 8.40 = 271.60 $  
  
Process returned 0 (0x0)   execution time : 16.253 s  
Press any key to continue.
```