ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

វិទ្យាស្ថានបច្ចេកវិទ្យាកម្ពុជា

ដេប៉ាតឺម៉ង់ថ្នាក់ឆ្នាំសិក្សាមូលដ្ឋាន

TP2-Variable

Subject: Data strucure & Programming

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TP3-Condition

Problem1: Write a program to test a valid date. A user is asked to input a date in this format: yyyy-mm-dd (eg.: 2023-10-25). The program tells whether the input date is valid or not.

Hint: Test different cases for range of valid year, range of valid month, and range of valid day which is depending on the month (some months may have 31 days, 30 days, 29 days, or 28 day, …etc)

Examples:

INPUT:

Enter a date (yyyy-mm-dd): 2023-10-25

Output:

The given date 2023-10-25 is a valid date.

……

INPUT:

Enter a date (yyyy-mm-dd): 2004-02-30

Output:

The given date 2004-02-30 is INVALID.

Code

problem1.c | problem2.c | teststrchr.c | teststrcmp.c | teststrchr.exe | problem1tp5.c | probllem4.c

problem1.c > main()

```c
#include<stdio.h>
int main(){
    int day,month,year;
    printf("Enter a date (yyyy-mm-dd):");
    scanf("%d-%d-%d",&year ,&month ,&day);
    if (year>=1&&year<=2025){
        if (month==1||month==3||month==5 ||month==7||month==8||month==10||month==12){//month end with 31day
            if(day>=1&&day<=31){
                printf("The date is valid!");
            }else{
                printf("The date is not valid!");
            }
        }else if (month==4||month==6||month==9 ||month==11){//month end with 30day
            if(day>=1&&day<=30){
                printf("The date is valis!");
            }else{
                printf("The date is not valid!");
            }
        }else if(month==2) {//month with 29or28 day
            if (year%4==0){
                if(day>=1&&day<=29){
                    printf("The date is valid!");
                }else{
                    printf("The date is not valid!");
                }
            }else{
                if(day>=1&&day<=28){
                    printf("The date is valid!");
                }else{
                    printf("The day is not valid!");
                }
            }
        }else{
           printf("The date is not valid!");
        }
    }else{
        printf("The date is not valid!");
    }

}
```

Result:

```
PS D:\TP4>  & 'c:\Users\User\.vscode\extensions\ms-vscode.cpptools-1.28.3-win32-x64\debugAdapters\
t5oqhd.qzl' '--stdout=Microsoft-MIEngine-Out-eou1yrtz.1pz' '--stderr=Microsoft-MIEngine-Error-u3qu
=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'
Enter a date (yyyy-mm-dd):2023-10-25
The date2023-10-25 is valid date
PS D:\TP4> ^C
PS D:\TP4>
PS D:\TP4>  & 'c:\Users\User\.vscode\extensions\ms-vscode.cpptools-1.28.3-win32-x64\debugAdapters\
igsupy.wco' '--stdout=Microsoft-MIEngine-Out-urgunxll.4s3' '--stderr=Microsoft-MIEngine-Error-2r3i
=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'
Enter a date (yyyy-mm-dd): 2004-02-30
The date2004-2-30 is not valid date
PS D:\TP4>
```

Problem2: Write a program to find the smallest among 4 numbers.

INPUT:

Enter 4 numbers: 10 20 -1 75

Output:

Among these 4 input numbers (10, 20, -1 and 75), the smallest is -1

Code

problem1.c | problem2.c | teststrchr.c | C/C++: gcc.exe build ... | tp5.c | problle

problem2.c > main()

```c
#include<stdio.h>
int main(){
    int n1,n2,n3,n4;
    printf("Enter 4 number:");
    scanf("%d %d %d %d ",&n1,n2,n3,n4);
    int small=n1;
    if (small>n2)n2=small;
    if(small>n3)n3=small;
    if(small>n4)n4=small;
    printf("Among these 4 input  number (%d %d %dand %d), the smallest is %d",n1,n2,n3,n4,small);

}
```

Result

```
PS D:\TP4>  & 'c:\Users\User\.vscode\extensions\ms-vscode.cpptools-1.28.3-w
fkpao3.zqr' '--stdout=Microsoft-MIEngine-Out-am1z5usx.3hy' '--stderr=Micros
=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'
Enter 4 number: 10 20 -1 75
Among these 4 input  number (10 10 6291192and 10), the smallest is 10
PS D:\TP4>
```

Problem3: Create a program that simulates a simple rock-paper-scissors game.

INPUT:

Output:

Enter option (rock, paper, scissor) by player 1: rock

Enter option (rock, paper, scissor) by player 2: paper

The player 2 won the player 1 because paper wins rock.

……

INPUT:

Output:

Enter option (rock, paper, scissor) by player 1: scissor

Enter option (rock, paper, scissor) by player 2: scissor

The player 1 & 2 are equal because they have the same scissor.

Note: In this game, rock wins scissor, paper wins rock, and scissor wins paper. Code:

Result

problem1.c | problem2.c | teststrchr.c | teststrcmp.c | teststrchr.exe | problem1tp5.c | problem4.c

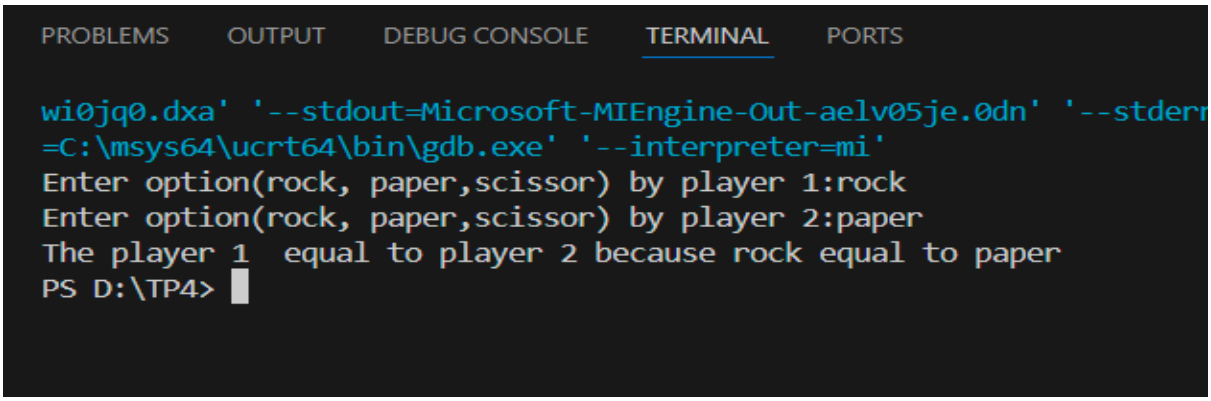
problem3.c > main()

```c
#include<stdio.h>
#include<string.h>
int main (){
    char p1[10];
    char p2[10];
    printf("Enter option(rock, paper,scissor) by player 1:");
    scanf("%s",p1);
    printf("Enter option(rock, paper,scissor) by player 2:");
    scanf("%s",p2);

    if((strcmp(p1, "rock")==0&&strcmp(p2,"scissor")==0)||
    (strcmp(p1,"paper")==0&&strcmp(p2,"rock")==0)||
    (strcmp(p1,"secissor")==0&&strcmp(p2,"paper")==0)){
    printf("The playr 1 win player 2 becuse %s win %s",p1,p2);
    }
    else if((strcmp(p1,"rock")==0&&strcmp(p2,"rock")==0)||(strcmp(p1,"paper")==0&&strcmp(p2,"paper")==0)
    ||((strcmp(p2,"paper")==0)||strcmp(p1,"secissor")==0&&strcmp(p2,"scissor")==0)){
        printf("The player 1  equal to player 2 because %s equal to %s",p1,p2 );
    }else{
        printf("The player 2 win player 1 because %s win %s ",p1,p2);
    }


}
```

Result



Problem4: Write a program to determine if a given string is a palindrome.

INPUT:

Enter a string: RADAR

Output:

The word RADAR is a palindrome

.....

INPUT:

Enter a string: HELLO

Output:

The word HELLO is not a palindrome

Code:

problem1.c | problem2.c | teststrchr.c | teststrcmp.c | teststrchr.exe

probllem4.c > main()

```c
#include<stdio.h>
#include<string.h>

int main() {
    char word[10];
    int lenword, i;
    int isPalindrome = 1;

    printf("Enter String:");
    scanf("%s", word);
    lenword = strlen(word);

    for(i = 0; i < lenword/2; i++) {
        if(word[i] != word[lenword-1-i]) {
            isPalindrome = 0;
            break;
        }
    }

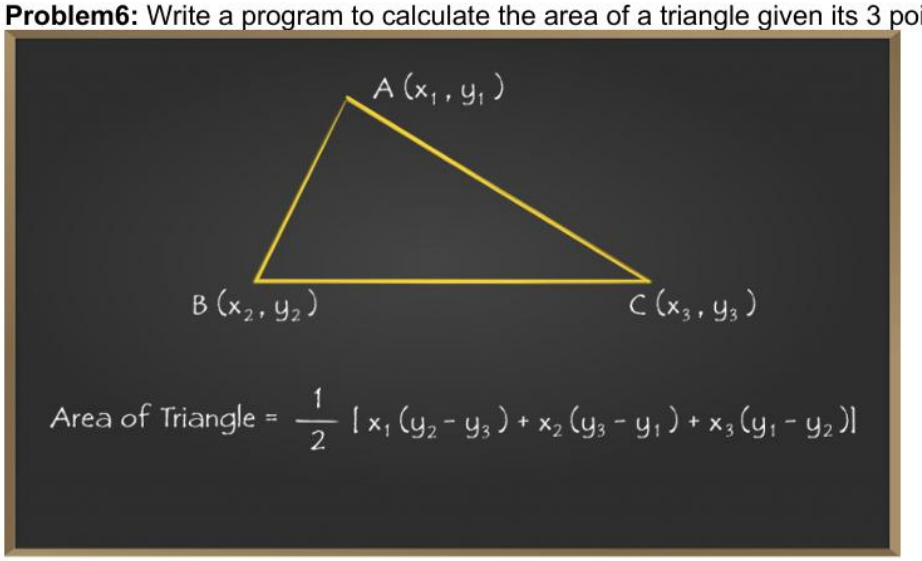
    if(isPalindrome) {
        printf("The word %s is a palindrome.", word);
    } else {
        printf("The word %s is not a palindrome.", word);
    }

    return 0;
}
```

Result

```
PS D:\TP4> & 'c:\Users\User\.vscode\extensions\ms-vscode.cpptools-1.28.3-win32-x64\debugAdapter
biddwx.rnb' '--stdout=Microsoft-MIEngine-Out-c3phxfnx.zfq' '--stderr=Microsoft-MIEngine-Error-g
=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'
Enter String: RADAR
The word RADAR is a palindrome.
PS D:\TP4> ^C
PS D:\TP4>
```

Problem6: Write a program to calculate the area of a triangle given its 3 points A, B and C.



The program tell message to the user as follows:

When the area is less than 3, display this message “it is a small triangle”.

When the area is in between [3, 10], display this message “it is a medium-size triangle”.

When the area is larger than 10, display this message “it is a large triangle”.

INPUT:

Enter coordinate x and y of point A: 1 2

Enter coordinate x and y of point B: 4 2

Enter coordinate x and y of point C: 3 5

Output:

The area of this triangle with point A(1,2), B(4,2) and C(3,5) is 4.5 square units.

……

Code

problem1.c | problem2.c | teststrchr.c | teststrcm | problem1tp5.c | probllem4.c | problem5.c

problem5.c > main()

```c
#include<stdio.h>
#include<math.h>
int main(){
 int x1,y1,x2,y2,x3,y3;
 printf("Enterr coordinate x and y of point A:");
 scanf("%d %d", &x1, &y2);
 printf("Enterr coordinate x and y of point B:");
 scanf("%d %d",&x2, &y2);
 printf("Enterr coordinate x and y of point C:");
 scanf("%d %d",&x3, &y3);
 float area=(float)0.5*(x1*(y2-y3)+x2*(y3-y1)+x3*(y1-y2));
 printf("The area of this triagle with pointA(%d,%d),B(%d,%d),C(%d,%d) is %.1f square units.",x1,y1,x2,y2,x3,y3,area);
 if(area<3){
    printf("It is a smalle triangle");
 }else if (area>=3&&area<=10){
    printf("it is a medium -side triagle.");
 }else if (area>10){
    printf("it is a large traingle.");
 }else {
    printf("No Codition");
 }


}
```

Result

PROBLEMS | OUTPUT | DEBUG CONSOLE | TERMINAL | PORT | C/C++: gcc.exe build ...

```
PS D:\TP4>  & 'c:\Users\User\.vscode\extensions\ms-vscode.cpptools-1.28.3-win32-x64\debugAdapters\bin\WindowsDebugLaunch
gkt3ld.lpj' '--stdout=Microsoft-MIEngine-Out-tbxnpxke.cry' '--stderr=Microsoft-MIEngine-Error-1qkzdbuw.3fm' '--pid=Micro
=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'
Enterr coordinate x and y of point A:1 2
Enterr coordinate x and y of point B:4 2
Enterr coordinate x and y of point C:3 5
The area of this triagle with pointA(1,0),B(4,2),C(3,5) is 5.5 square units.it is a medium -side triagle.
PS D:\TP4>
```

Problem8: Create a program that determines the day of the week for a given date.

INPUT:

Enter a valid date (yyyy-mm-dd): 2023-12-25

Output:

It is day 4 of week 4 of the month.

Note: Zeller's Congruence is an algorithm devised by Christian Zeller to calculate the day of the week for any date. The algorithm provides a formula that takes the year, month, and day as input and produces an integer representing the day of the week. The result is usually an integer from 0 to 6, where 0 corresponds to Saturday, 1 to Sunday, and so on.

1. Adjustment for January and February:

If the month is January or February, it is treated as months 13 and 14 of the previous year (month+=12).

2. Calculation of day of the weeks: formula:

= (day + (13 * (month + 1)) / 5 + year + year / 4 - year / 100 + year / 400) % 7

3. Week of the month: (day+ 6) / 7

Code:

problem1.c | problem2.c | teststrchr.c | problem8.c | teststrcmp.c | teststrchr.exe

problem8.c > main()

```c
#include <stdio.h>

int main() {
    int year, month, day;
    int y, m, h, week;

    printf("Enter a valid date (yyyy-mm-dd): ");
    scanf("%d-%d-%d", &year, &month, &day);

    y = year;
    m = month;

    if (m == 1 || m == 2) {
        m += 12;
        y -= 1;
    }

    h = (day + (13 * (m + 1)) / 5 + y + (y / 4) - (y / 100) + (y / 400)) % 7;

    week = (day + 6) / 7;

    printf("It is day %d of week %d of the month.\n", h, week);

    return 0;
}

```

Result:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS D:\TP4>  & 'c:\Users\User\.vscode\extensions\ms-vscode.cpptools-1.28.3-win32
kgcplu.jl1' '--stdout=Microsoft-MIEngine-Out-drwgp4sq.ghx' '--stderr=Microsoft-
=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'
Enter a valid date (yyyy-mm-dd):  2023-12-25
It is day 2 of week 4 of the month.
PS D:\TP4>
```