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DEPARTMENT; CHEMICAL ENGINEERING

ENG 224 STRUCTURED COMPUTER PROGRAMMING

ASSIGNMENT

```
1. #include <stdio.h>
#include <stdlib.h>
int main()
{
    int days, weeks, years;
    int a,b;
    printf("ENTER NUMBER OF DAYS=");
    scanf("%d",&days);
    years= days/356;
    a=days%356;
    weeks= days/7;
    b=days%7;
    printf("\n number of days is equal %d", days);
    printf("\n number of years is equal %d", years);
    printf("\n number of days left with years %d", a);
    printf("\n number of weeks %d", weeks);
    printf("\n number of days left with weeks %d", b);
    return 0;
}
```

The screenshot shows the Code::Blocks IDE interface. The main window displays the C source code for 'main.c' in the 'mainc' file. The code calculates the conversion of days into years, weeks, and days left. It includes #include directives for stdio.h and stdlib.h, a main function, and various printf and scanf statements. The code is color-coded for syntax. Below the code editor is a log window titled 'Logs & others' which is currently empty. The status bar at the bottom shows the file path 'C:\Users\TUJA\Desktop\c programme\assignmenthome1\main.c', the compiler 'C/C++', the encoding 'Windows (CR+LF)', the line number 'Line 18', the column 'Col 46', the position 'Pos 489', and the build status 'Insert Read/Write default'. The system tray shows the date and time as 24/04/2020 11:17 AM.

```
1 //include <stdio.h>
2 //include <stdlib.h>
3
4 int main()
5 {
6     int days, weeks, years;
7     int a,b;
8     printf("ENTER NUMBER OF DAYS=");
9     scanf("%d",&days);
10    years=days/365;
11    a=days%365;
12    weeks=a/7;
13    b=days%7;
14    printf("\n number of days is equal %d", days);
15    printf("\n number of years is equal %d", years);
16    printf("\n number of days left with years %d", a);
17    printf("\n number of weeks %d", weeks);
18    printf("\n number of days left with weeks %d", b);
19
20    return 0;
21 }
```

The screenshot shows the Code::Blocks IDE interface after running the program. The terminal window displays the output of the executable 'assignmenthome1.exe'. The user enters '1343' as the number of days. The program then prints the equivalent values: 3 years, 1 week, and 2 days left, along with the total number of weeks (191). It also prints the number of days left with weeks (6). The process exits with a status of 0. The status bar at the bottom shows the file path 'C:\Users\TUJA\Desktop\c programme\assignmenthome1\bin\Debug\assignmenthome1.exe', the compiler 'C/C++', the encoding 'Windows (CR+LF)', the line number 'Line 18', the column 'Col 46', the position 'Pos 489', and the build status 'Insert Read/Write default'. The system tray shows the date and time as 24/04/2020 11:19 AM.

```
ENTER NUMBER OF DAYS=1343
number of days is equal 1343
number of years is equal 3
number of days left with years 275
number of weeks 191
number of days left with weeks 6
Process returned 0 (0x0) execution time : 5.595 s
```

```
2. #include <stdio.h>
#include <stdlib.h>
#include <math.h>
int main()
{
    float x1, y1, x2, y2, distance, y;
    printf("Input x-coordinate of first point: ");
    scanf("%f", &x1);
    printf("Input y-coordinate of first point: ");
    scanf("%f", &y1);
    printf("Input x-coordinate of second point: ");
    scanf("%f", &x2);
    printf("Input y-coordinate of second point: ");
    scanf("%f", &y2);
    distance = ((x2-x1)*(x2-x1))+((y2-y1)*(y2-y1));
    y=sqrt(distance);
    printf("Distance between the said points: %f", y);
    printf("\n");
    return 0;
}
```

The screenshot shows the Code::Blocks IDE interface. The main window displays the code for `main.c` which calculates the distance between two points. The code includes #include directives for `<stdio.h>`, `<stdlib.h>`, and `<math.h>`. It defines a function `main` that reads coordinates from the user, calculates the distance using the formula $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$, and prints the result. The logs window shows the build process and the execution of the program, which outputs the calculated distance.

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

int main()
{
    float x1, y1, x2, y2, distance, r;
    printf("Input x-coordinate of first point: ");
    scanf("%f", &x1);
    printf("Input y-coordinate of first point: ");
    scanf("%f", &y1);
    printf("Input x-coordinate of second point: ");
    scanf("%f", &x2);
    printf("Input y-coordinate of second point: ");
    scanf("%f", &y2);
    distance = ((x2 - x1) * (x2 - x1)) + ((y2 - y1) * (y2 - y1));
    r = sqrt(distance);
    printf("Distance between the said points: %f", r);
    printf("\n");
    return 0;
}
```

Logs & others

```
-- Run: Debug in assignment2homeA (compiler: GNU GCC Compiler)
Checking for existence: C:\Users\ITUA\Desktop\c programme\assignment2homeA\bin\Debug\assignment2homeA.exe
Executing: "C:\Program Files (x86)\CodeBlocks\cb_console_runner.exe" "C:\Users\ITUA\Desktop\c programme\assignment2homeA\bin\Debug\assignment2homeA.exe" (in C:\Users\ITUA\Desktop\c programme\assignment2homeA\.)
Process terminated with status 1073741510 (1 minute(s), 20 second(s))

Activate Windows
Go to Settings to activate Windows.
```

This screenshot shows the Code::Blocks IDE with a terminal window open. The terminal window displays the output of the program execution. The user inputs the coordinates for two points, and the program calculates and prints the distance between them. The terminal window also shows the process status and a prompt to press any key to continue.

```
Input x-coordinate of first point: 7.865
Input y-coordinate of first point: 4.332
Input x-coordinate of second point: 2.890
Input y-coordinate of second point: 3.456
Distance between the said points: 5.051534

Process returned 0 (0x0) execution time : 18.747 s
Press any key to continue.
```

Logs & others

```
-- Run: Debug in assignment2homeA (compiler: GNU GCC Compiler)
Checking for existence: C:\Users\ITUA\Desktop\c programme\assignment2homeA\bin\Debug\assignment2homeA.exe
Executing: "C:\Program Files (x86)\CodeBlocks\cb_console_runner.exe" "C:\Users\ITUA\Desktop\c programme\assignment2homeA\bin\Debug\assignment2homeA.exe" (in C:\Users\ITUA\Desktop\c programme\assignment2homeA\.)
Process terminated with status 1073741510 (1 minute(s), 20 second(s))

Activate Windows
Go to Settings to activate Windows.
```

```
3. #include <stdio.h>
#include <stdlib.h>

int main()
{
    float a, b, c, Perimeter, Area;
    printf("\nEnter the first value a: ");
    scanf("%f", &a);
    printf("\nEnter the second value b: ");
    scanf("%f", &b);
    printf("\nEnter the third value c: ");
    scanf("%f", &c);

    if(a < (b+c) && b < (a+c) && c < (b+a)){
        Perimeter = a+b+c;
        printf("\nPerimeter = %.1f\n", Perimeter);}
    else
    {
        printf("Values invalid to create a triangle!");
    }
    return 0;
}
```

main.c [assignment3] - Code::Blocks 17.12

File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins Doxygen Blocks Settings Help

Projects Symbols Files >

Management

main.c main.c main.c

```
int main()
{
    float a, b, c, Perimeter, Area;
    printf("Enter the first value a: ");
    scanf("%f", &a);
    printf("Enter the second value b: ");
    scanf("%f", &b);
    printf("Enter the third value c: ");
    scanf("%f", &c);

    if(a < (b+c) && b < (a+c) && c < (b+a))
        Perimeter = a+b+c;
    else
        printf("Values invalid to create a triangle!");
    return 0;
}
```

Logs & others

File Line Message

```
main: Debug in assignment3 (compiler: GNU GCC Compiler)
In function 'main':
C:\Users\ITUA\... warning: unused variable 'Area' [-Wunused-variable]
C:\Users\ITUA\...   main: Build finished: 0 errors(s), 1 warning(s) (0 minute(s), 0 second(s)) ===
```

Activate Windows
Go to Settings to activate Windows.

C/C++ Windows (CR-LF) WINDOWS-1252 Line 16, Col 50, Pos 411 Insert Read/Write default 11:40 AM 24/04/2020

main.c [assignment3] - Code::Blocks 17.12

File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins Doxygen Blocks Settings Help

Projects Symbols Files >

Management

main.c main.c main.c

"C:\Users\ITUA\Desktop\c programme\assignment3\bin\Debug\assignment3.exe"

```
Enter the first value a: 3
Enter the second value b: 5
Enter the third value c: 7
Perimeter = 15.0

Process returned 0 (0x0) execution time : 23.719 s
Press any key to continue.
```

Activating window
Go to Settings to activate Windows.

C:/Users/ITUA/Desktop/c programme/assignment3/main.c C/C++ Windows (CR-LF) WINDOWS-1252 Line 16, Col 50, Pos 411 Insert Read/Write default 11:40 AM 24/04/2020

main.c [assignment3] - Code::Blocks 17.12

File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins Doxygen Blocks Settings Help

Projects Symbols Files >

Management

main.c main.c main.c

"C:\Users\ITUA\Desktop\c programme\assignment3\bin\Debug\assignment3.exe"

```
Enter the first value a: 1
Enter the second value b: 2
Enter the third value c: 3
Values invalid to create a triangle!
Process returned 0 (0x0) execution time : 4.188 s
Press any key to continue.
```

----- Run: Debug in Assignment3 (compiler: GNU GCC Compiler) -----
Checking for existence: C:\Users\ITUA\Desktop\c programme\assignment3\bin\Debug\assignment3.exe
Executing: "C:\Program Files (x86)\CodeBlocks\cb_console_runner.exe" "C:\Users\ITUA\Desktop\c programme\assignment3\bin\Debug\assignment3.exe"
Go to Settings to activate Windows.

C/C++ Windows (CR-LF) WINDOWS-1252 Line 16, Col 50, Pos 411 Insert Read/Write default 11:42 AM 24/04/2020

```
4. #include <stdio.h>
#include <stdlib.h>
int main()
{
    int age;
    int cnt_baby=0,cnt_school=0,cnt_adult=0;
    int count=0;
    while(count<20)
    {
        printf("Enter age of person [%d]: ",count+1);
        scanf("%d",&age);
        if(age>=0 && age<=4)
            cnt_baby++;
        if(age>=5 && age<=17)
            cnt_school++;
        else
            cnt_adult++;
        count++;
    }
    printf("BABY AGE: %d\n",cnt_baby);
    printf("SCHOOL AGE: %d\n",cnt_school);
    printf("ADULT AGE: %d\n",cnt_adult);
    return 0;
}
```

```
main.c [assignmenthome4] - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins Doxygen Settings Help
<global>
Management
Projects Symbols Files
Workspace assignmenthome4 Sources
main.c
1 #include <stdio.h>
2 #include <stdlib.h>
3 int main()
4 {
5     int age;
6     int cnt_baby=0, cnt_school=0, cnt_adult=0;
7     int count=0;
8     while(count<20)
9     {
10         printf("Enter age of person [%d]: ", count+1);
11         scanf("%d", &age);
12         if(age<0 || age>4)
13             cnt_baby++;
14         if(age>4 && age<17)
15             cnt_school++;
16         else
17             cnt_adult++;
18         count++;
19     }
20     printf("BABY AGE: %d\n", cnt_baby);
21     printf("SCHOOL AGE: %d\n", cnt_school);
22     printf("ADULT AGE: %d\n", cnt_adult);
23     return 0;
24 }
```

Logs & others

```
Run: Debug in assignmenthome4 (compiler: GNU GCC Compiler)
Checking for existence: C:\Users\ITUA\Desktop\programme\assignmenthome4\bin\Debug\assignmenthome4.exe
Executing: "C:\Program Files (x86)\CodeBlocks\bin\console_runner.exe" "C:\Users\ITUA\Desktop\programme\assignmenthome4\bin\Debug\assignmenthome4.exe" (in C:\Users\ITUA\Desktop\programme\assignmenthome4)
Process terminated with status -1073741510 (1 minute(s), 14 second(s))
```

C:\Users\ITUA\Desktop\c programme\assignmenthome4\main.c C/C++ Windows (CR+LF) WINDOWS-1252 Line 1, Col 1, Pos 0 Insert Read/Write default 3:28 PM 24/04/2020

```
main.c [assignmenthome4] - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins Doxygen Settings Help
<global>
Management
Projects Symbols Files
Workspace assignmenthome4 Sources
main.c
5 int age;
6 int cnt_baby=0, cnt_school=0, cnt_adult=0;
7 int count=0;
8 while(count<20)
9 {
10     printf("Enter age of person [%d]: ", count+1);
11     scanf("%d", &age);
12     if(age<0 || age>4)
13         cnt_baby++;
14     if(age>4 && age<17)
15         cnt_school++;
16     else
17         cnt_adult++;
18     count++;
19 }
20 printf("BABY AGE: %d\n", cnt_baby);
21 printf("SCHOOL AGE: %d\n", cnt_school);
22 printf("ADULT AGE: %d\n", cnt_adult);
23 return 0;
24 }
```

Logs & others

```
Run: Debug in assignmenthome4 (compiler: GNU GCC Compiler)
Checking for existence: C:\Users\ITUA\Desktop\programme\assignmenthome4\bin\Debug\assignmenthome4.exe
Executing: "C:\Program Files (x86)\CodeBlocks\bin\console_runner.exe" "C:\Users\ITUA\Desktop\c programme\assignmenthome4\"
Process terminated with status -1073741510 (1 minute(s), 14 second(s))
```

Screenshot saved
The screenshot was added to your OneDrive Windows
OneDrive Settings to activate Windows.

C:\Users\ITUA\Desktop\c programme\assignmenthome4\main.c C/C++ Windows (CR+LF) WINDOWS-1252 Line 1, Col 1, Pos 0 Insert Read/Write default 3:28 PM 24/04/2020

```
main.c [assignmenthome4] - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins Doxygen Settings Help
<global>
Management
Projects Symbols Files
Workspace assignmenthome4 Sources
main.c
Enter age of person [1]: 6
Enter age of person [2]: 1
Enter age of person [3]: 2
Enter age of person [4]: 0
Enter age of person [5]: 5
Enter age of person [6]: 7
Enter age of person [7]: 98
Enter age of person [8]: 12
Enter age of person [9]: 15
Enter age of person [10]: 19
Enter age of person [11]: 20
Enter age of person [12]: 34
Enter age of person [13]: 43
Enter age of person [14]: 55
Enter age of person [15]: 66
Enter age of person [16]: 87
Enter age of person [17]: 24
Enter age of person [18]: 29
Enter age of person [19]: 78
Enter age of person [20]: 45
BABY AGE: 5
SCHOOL AGE: 5
ADULT AGE: 15

Process returned 0 (0x0) execution time : 61.067 s
Press any key to continue.

C:\Users\ITUA\Desktop\c programme\assignmenthome4\main.c C/C++ Windows (CR+LF) WINDOWS-1252 Line 1, Col 1, Pos 0 Insert Read/Write default 3:28 PM 24/04/2020
```

```
5. #include <stdio.h>
#include <stdlib.h>
#include <time.h>
#include <math.h>

int main()
{
    int random_genNo=0,count=0,num;
    int shorttime;
    long longtime;

    longtime = time(NULL);
    shorttime = (unsigned)time/2;
    srand(shorttime);

    //generates random number
    random_genNo=rand()% 100;

    //run infinite loop
    while(1)
    {
        //increase counter
        count+=1;

        //read number from user
        printf("\n\nENTER A NUMBER (0 to 100): ");
        scanf("%d",&num);

        //compare entered number with generated number
    }
}
```

```

if(random_genNo==num){

    printf("CONGRATS, YOU HAVE GUESSED THE CORRECT NUMBER");

    break;

}

else if(random_genNo<num){

    printf("NUMBER GENERATED IS LESS THAN NUMBER ENTERED!TRY AGAIN");

}

else if(random_genNo>num){

    printf("NUMBER GENERATED IS GREATER THAN NUMBER ENTERED.TRY AGAIN.");

}

if(count==7){

    printf("\n\nMAXIMUM NUMBER OF ATTEMPTS REACHED,TRY AGAIN NEXT TIME!\n");

    break;

}

return 0;
}

```

The screenshot shows the Code::Blocks IDE interface. The top menu bar includes File, Edit, View, Search, Project, Build, Debug, Fortran, wxSmith, Tools+, Plugins, DocBlocks, Settings, Help. The main window has tabs for global, main.c, and Log & others. The main.c tab displays the C code for a guessing game. The Log & others tab shows the build process and its output:

```

main.c [asssing5] - Code::Blocks 17.12
File Edit View Search Project Build Debug Fortran wxSmith Tools+ Plugins DocBlocks Settings Help
global main.c
Log & others
File Line Message
C:\Users\ITUA... 1 --- Build: Debug in asssing5 (compiler: GNU GCC Compiler) ---
In function 'main':
C:\Users\ITUA... 2 warning: variable 'longtime' set but not used [-Wunused-but-set-variable]
C:\Users\ITUA... 10 warning: variable 'longtime' set but not used [-Wunused-but-set-variable]
--- Build finished: 0 errors(s), 1 warning(s) (0 minute(s), 0 second(s)) ---
C:\Users\ITUA... 10 --- Run: Debug in asssing5 (compiler: GNU GCC Compiler) ---
Activate Windows
Go to Settings to activate Windows.

```

The status bar at the bottom indicates the file is C:/Users/ITUA/Desktop/c programme/asssing5/main.c, the compiler is I/C++, the operating system is Windows (CR-LF), the build number is WINDOWS-1252, the line is 26, column is 21, position is 474, and the time is 10:24 PM on 25/04/2020.

The screenshot shows the Code::Blocks IDE interface with the following details:

- Title Bar:** File, Edit, View, Search, Project, Build, Debug, Fortran, wxSmith, Tools+, Plugins, DocyBlocks, Settings, Help.
- Toolbar:** Standard icons for file operations, build, and search.
- Project Explorer:** Shows a project named "assasg5" with a single source file "main.c".
- Code Editor:** Displays the C code for a number guessing game. The code includes generating a random number between 0 and 100, prompting the user to enter a number, and comparing it with the generated number. It handles three cases: correct guess, less than, and greater than.
- Log and Others:** A tabbed interface showing logs and other project-related information.
- Status Bar:** Shows the current file is "main.c", the build configuration is "Debug", and the line number is 474.

The screenshot shows the Code::Blocks IDE interface with the following details:

- Title Bar:** main.c [asssing5] - Code::Blocks 17.12
- Menu Bar:** File, Edit, View, Search, Project, Build, Debug, Fortran, wxSmith, Tools, Tools+, Plugins, Doc/Blocks, Settings, Help
- Toolbar:** Includes icons for Open, Save, Build, Run, Stop, and others.
- Project Explorer:** Shows the project "asssing5" with a single file "main.c" selected.
- Code Editor:** Displays the C code for a number guessing game. The code uses a random number generator to guess a number between 1 and 10. It prompts the user to enter a guess and prints messages based on whether the guess is correct, less than, or greater than the random number. It also handles cases where the user enters non-integer values and reaches the maximum attempt limit of 7.
- Logs & Others:** Shows the build messages tab, which displays compiler output for the "main" function.
- Bottom Status Bar:** Shows the file path "C:\Users\ITUA\Desktop\c programs\asssing5\main.c", the editor mode "C/C++", the line number "Line 26, Col 21, Pos 474", and tabs for Insert, Read/Write, and default.

main.c [assssig5] - Code:Blocks 17.12

File Edit View Search Project Build Debug Fortran wxSmith Tools Tools+ Plugins DoxyBlocks Settings Help

<global>

ENTER A NUMBER (0 to 100): 90
NUMBER GENERATED IS LESS THAN NUMBER ENTERED!TRY AGAIN

ENTER A NUMBER (0 to 100): 60
NUMBER GENERATED IS LESS THAN NUMBER ENTERED!TRY AGAIN

ENTER A NUMBER (0 to 100): 20
NUMBER GENERATED IS GREATER THAN NUMBER ENTERED.TRY AGAIN.

ENTER A NUMBER (0 to 100): 30
NUMBER GENERATED IS LESS THAN NUMBER ENTERED!TRY AGAIN

ENTER A NUMBER (0 to 100): 25
NUMBER GENERATED IS GREATER THAN NUMBER ENTERED.TRY AGAIN.

ENTER A NUMBER (0 to 100): 22
NUMBER GENERATED IS GREATER THAN NUMBER ENTERED.TRY AGAIN.

ENTER A NUMBER (0 to 100): 23
NUMBER GENERATED IS GREATER THAN NUMBER ENTERED.TRY AGAIN.

MAXIMUM NUMBER OF ATTEMPTS REACHED,TRY AGAIN NEXT TIME!

Process returned 0 (0x0) execution time : 43.772 s

Press any key to continue.

----- Run: Debug in assssig5 (compiler: GNU GCC Compiler)-----
Checking for existence: C:\Users\ITUA\Desktop\c programme\assssig5\bin\Debug\assssig5.exe
Executing: "C:\Program Files (x86)\CodeBlocks\cb_console_runner.exe" "C:\Users\ITUA\Desktop\c programme\assssig5\bin\Debug\assssig5.exe" In C:\Users\ITUA\Desktop\c programme\assssig5\

Go to Settings to activate Windows.

