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DEPARTMENT: Mechatronics Engineering

COURSE: ENG 224 Assignment
(C Programming)

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

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

```
#include <time.h> //library required to generate random integer in problem 7
```

```
//NOTE that the solution to all the problems are in form of functions that can be run within the main function
```

```
int main()
```

```
{
```

```
    guess();
```

```
    return 0;
```

```
}
```

```
//To convert 1343 days to years, weeks and days
```

```
void days()
```

```
{
```

```
    int count = 1343, years, weeks, days;
```

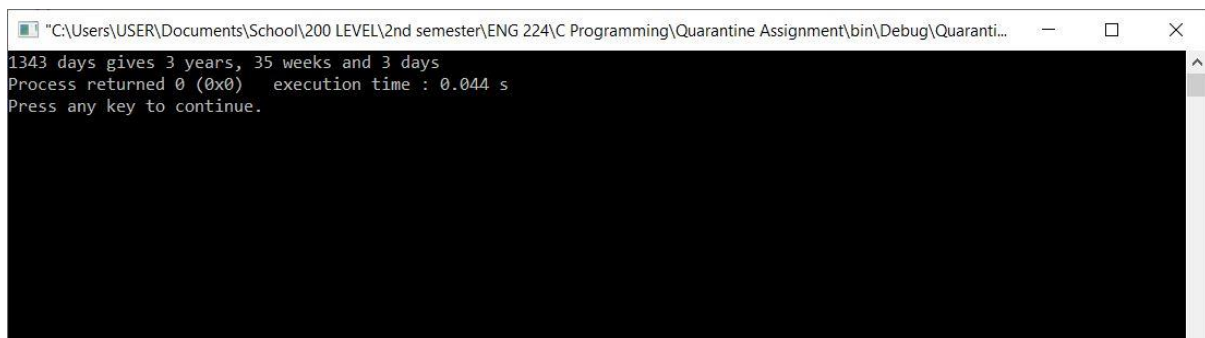
```
    years = count / 365;
```

```
    weeks = (count % 365) / 7;
```

```
    days = count - ((years * 365)+(weeks * 7));
```

```
    printf("%d days gives %d years, %d weeks and %d days", count, years, weeks, days);
```

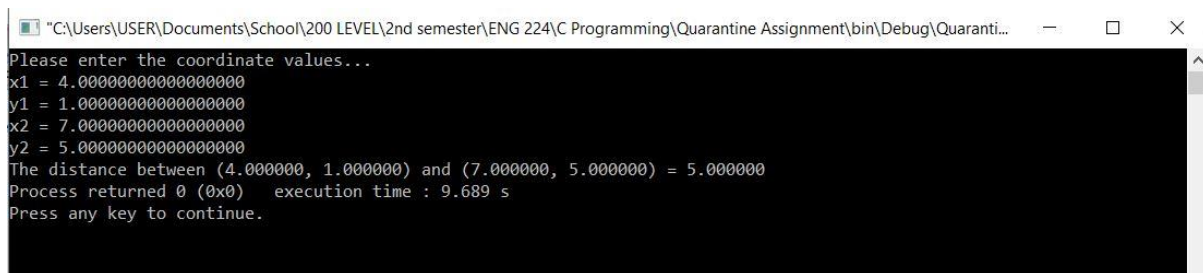
```
}
```



```
"C:\Users\USER\Documents\School\200 LEVEL\2nd semester\ENG 224\C Programming\Quarantine Assignment\bin\Debug\Quaranti...  -  □  ×  
1343 days gives 3 years, 35 weeks and 3 days  
Process returned 0 (0x0) execution time : 0.044 s  
Press any key to continue.
```

```
//To calculate the distance between two points with co-ordinates (x1, y1) and (x2, y2)
```

```
void distance()  
{  
    double x1, x2, y1, y2, distance, xdiff, ydiff, powsum;  
    printf("Please enter the coordinate values...\nx1 = ");  
    scanf("%lf", &x1);  
    printf("y1 = ");  
    scanf("%lf", &y1);  
    printf("x2 = ");  
    scanf("%lf", &x2);  
    printf("y2 = ");  
    scanf("%lf", &y2);  
    xdiff = x2 - x1;  
    ydiff = y2 - y1;  
    powsum = pow(xdiff, 2) + pow(ydiff, 2);  
    distance = sqrt(powsum);  
    printf("The distance between (%lf, %lf) and (%lf, %lf) = %lf",x1, y1, x2, y2, distance);  
}
```



```
"C:\Users\USER\Documents\School\200 LEVEL\2nd semester\ENG 224\C Programming\Quarantine Assignment\bin\Debug\Quaranti...  
Please enter the coordinate values...  
x1 = 4.0000000000000000  
y1 = 1.0000000000000000  
x2 = 7.0000000000000000  
y2 = 5.0000000000000000  
The distance between (4.000000, 1.000000) and (7.000000, 5.000000) = 5.000000  
Process returned 0 (0x0)   execution time : 9.689 s  
Press any key to continue.
```

//To test if three floating values, a, b and c can form a triangle and calculate the perimeter if they can

```
void triangle()
{
    float a, b, c;

    printf("Enter length a: ");

    scanf("%f", &a);

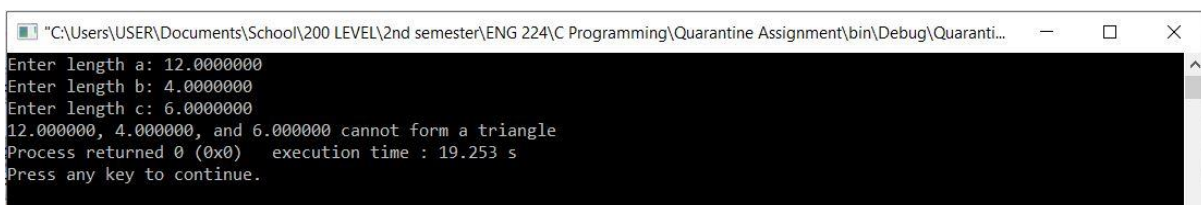
    printf("Enter length b: ");

    scanf("%f", &b);

    printf("Enter length c: ");

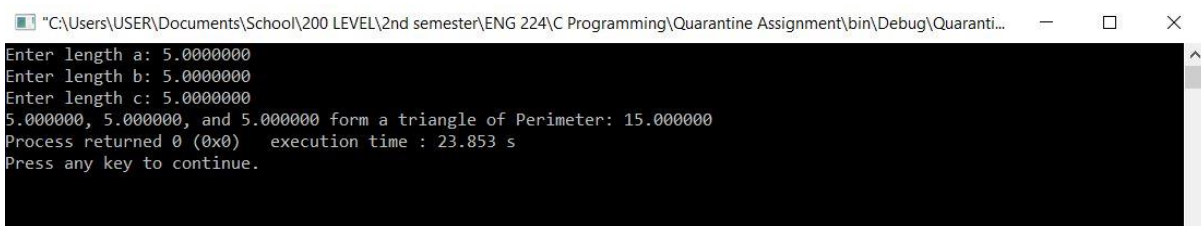
    scanf("%f", &c);

    if ((a + b) > c && (a + c) > b && (b + c) > a)
    {
        printf("%f, %f, and %f form a triangle of Perimeter: %f", a, b, c, (a + b + c));
    }
    else
    {
        printf("%f, %f, and %f cannot form a triangle", a, b, c);
    }
}
```



```
"C:\Users\USER\Documents\School\200 LEVEL\2nd semester\ENG 224\C Programming\Quarantine Assignment\bin\Debug\Quaranti...
Enter length a: 12.000000
Enter length b: 4.000000
Enter length c: 6.000000
12.000000, 4.000000, and 6.000000 cannot form a triangle
Process returned 0 (0x0)   execution time : 19.253 s
Press any key to continue.
```

Scenario where triangle cannot be formed, no perimeter



```
"C:\Users\USER\Documents\School\200 LEVEL\2nd semester\ENG 224\C Programming\Quarantine Assignment\bin\Debug\Quaranti...
Enter length a: 5.000000
Enter length b: 5.000000
Enter length c: 5.000000
5.000000, 5.000000, and 5.000000 form a triangle of Perimeter: 15.000000
Process returned 0 (0x0)   execution time : 23.853 s
Press any key to continue.
```

Scenario where triangle can be formed, perimeter displayed

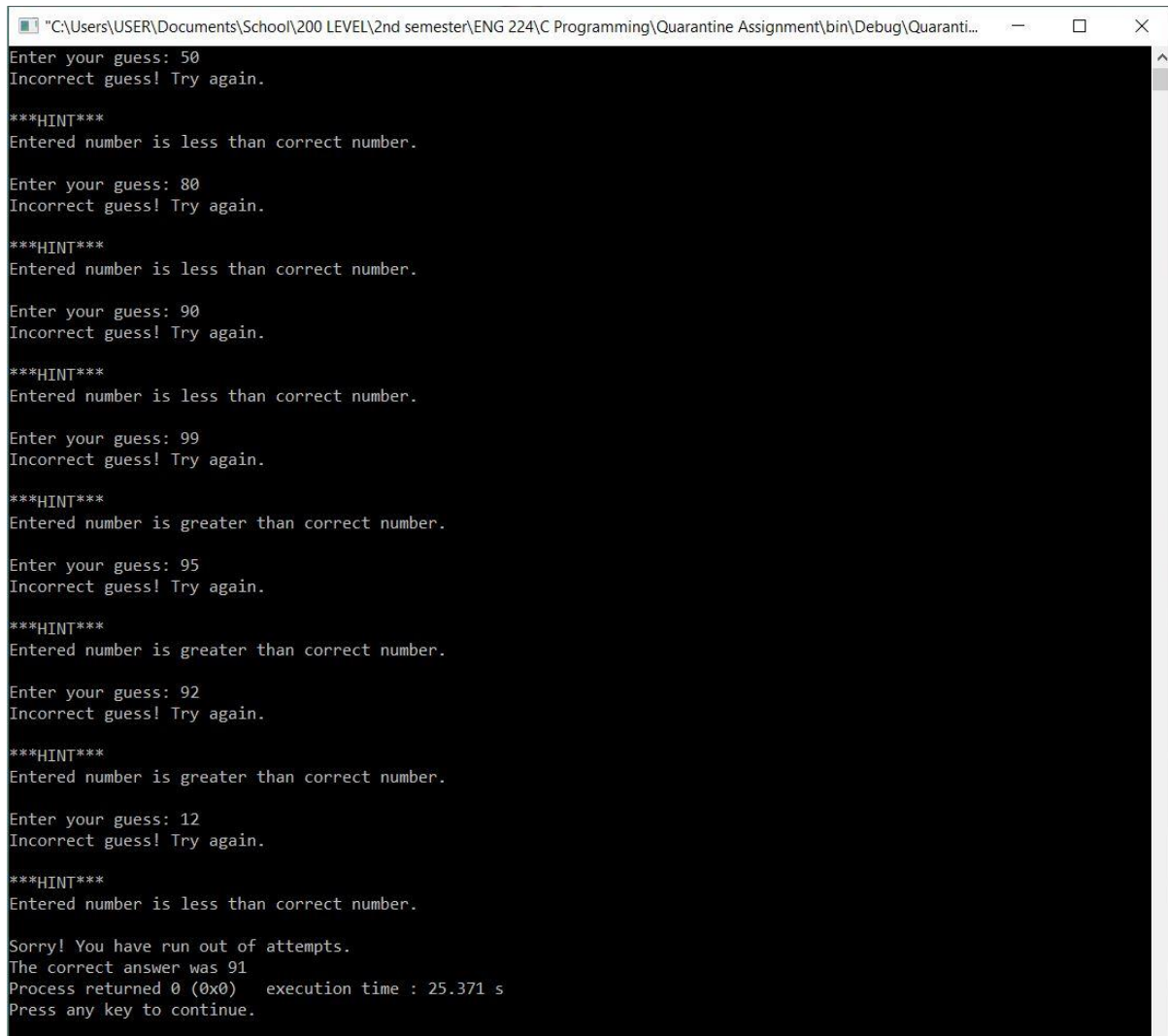
```
//To read the age of twenty people and classify them based on age
void age()
{
    int i, Baby_Count = 0, School_Count = 0, Adult_Count = 0;
    while (Baby_Count + School_Count + Adult_Count < 20){
        printf("Enter age of individual: ");
        scanf("%d", &i);
        if (i <= 4)
        {
            Baby_Count ++;
        }
        else if (i >= 5 && i <= 17)
        {
            School_Count ++;
        }
        else
        {
            Adult_Count ++;
        }
    }
    printf("Babies = %d\nSchool Children = %d\nAdults = %d", Baby_Count, School_Count,
    Adult_Count);
}
```

```
*C:\Users\USER\Documents\School\200 LEVEL\2nd semester\ENG 224\C Programming\Quarantine Assignment\bin\Debug\Quaranti...
Enter age of individual: 3
Enter age of individual: 18
Enter age of individual: 11
Enter age of individual: 50
Enter age of individual: 45
Enter age of individual: 18
Enter age of individual: 24
Enter age of individual: 21
Enter age of individual: 65
Enter age of individual: 55
Enter age of individual: 1
Enter age of individual: 4
Enter age of individual: 15
Enter age of individual: 17
Enter age of individual: 10
Enter age of individual: 5
Enter age of individual: 61
Enter age of individual: 72
Enter age of individual: 9
Enter age of individual: 2
Babies = 4
School Children = 6
Adults = 10
Process returned 0 (0x0)   execution time : 84.234 s
Press any key to continue.
```

//Program to generate a random number between 1 and 100 and give seven attempts for the user to answer

```
void guess()
{
    int r, attempt = 7, guess;
    srand(time(NULL)); //initialisation
    r = rand() % 101; //returns a random integer between 0 and 100
    while (attempt != 0)
    {
        printf("Enter your guess: ");
        scanf("%d", &guess);
        if (guess == r)
        {
            printf("YOU GUESSED CORRECTLY!");
            attempt = 0;
        }
        else
        {
            if (guess < r)
            {
                printf("Incorrect guess! Try again.\n \n***HINT***\nEntered number is less than correct number.\n \n");
            }
            else
            {
                printf("Incorrect guess! Try again.\n \n***HINT***\nEntered number is greater than correct number.\n \n");
            }
            if (attempt == 1)
            {
                printf("Sorry! You have run out of attempts. \nThe correct answer was %d", r);
            }
        }
    }
}
```

```
        attempt--;  
    }  
}  
}
```



```
"C:\Users\USER\Documents\School\200 LEVEL\2nd semester\ENG 224\C Programming\Quarantine Assignment\bin\Debug\Quaranti...  
Enter your guess: 50  
Incorrect guess! Try again.  
***HINT***  
Entered number is less than correct number.  
Enter your guess: 80  
Incorrect guess! Try again.  
***HINT***  
Entered number is less than correct number.  
Enter your guess: 90  
Incorrect guess! Try again.  
***HINT***  
Entered number is less than correct number.  
Enter your guess: 99  
Incorrect guess! Try again.  
***HINT***  
Entered number is greater than correct number.  
Enter your guess: 95  
Incorrect guess! Try again.  
***HINT***  
Entered number is greater than correct number.  
Enter your guess: 92  
Incorrect guess! Try again.  
***HINT***  
Entered number is greater than correct number.  
Enter your guess: 12  
Incorrect guess! Try again.  
***HINT***  
Entered number is less than correct number.  
Sorry! You have run out of attempts.  
The correct answer was 91  
Process returned 0 (0x0)   execution time : 25.371 s  
Press any key to continue.
```

Maximum number of attempts (7) is reached, the answer is displayed and the program terminates

```
"C:\Users\USER\Documents\School\200 LEVEL\2nd semester\ENG 224\C Programming\Quarantine Assignment\bin\Debug\Quaranti...
Enter your guess: 80
Incorrect guess! Try again.

***HINT***
Entered number is greater than correct number.

Enter your guess: 50
Incorrect guess! Try again.

***HINT***
Entered number is greater than correct number.

Enter your guess: 30
Incorrect guess! Try again.

***HINT***
Entered number is less than correct number.

Enter your guess: 40
Incorrect guess! Try again.

***HINT***
Entered number is greater than correct number.

Enter your guess: 36
Incorrect guess! Try again.

***HINT***
Entered number is less than correct number.

Enter your guess: 37
YOU GUESSED CORRECTLY!
Process returned 0 (0x0)   execution time : 37.486 s
Press any key to continue.
```

Correct number is guessed and the program terminates.