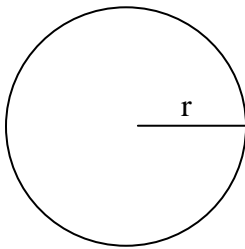


Some Common Programming Errors in BIL105E Exams

Question-1)

Write a program to calculate and display the area of a circle.
The user will enter the radius (r) value from the keyboard.
The following is the necessary formula (A is area):

$$A = \pi r^2$$



/ This program has errors */*

```
#include <stdio.h>

main()
{
    int r,  $\pi$ ;

    float A;

    scanf("Please enter the radius : ", r);

     $A = \pi .r^2$ ;

    printf(" Area is : %f " , A);
}
```

/ This program is correct */*

```
#include <stdio.h>

#define PI 3.14

main()
{
    int r;
    float A;

    printf("Please enter the radius : ");
    scanf("%d", &r);

    A = PI * r * r;

    printf(" Area is : %f " , A);
}
```

Question-2)

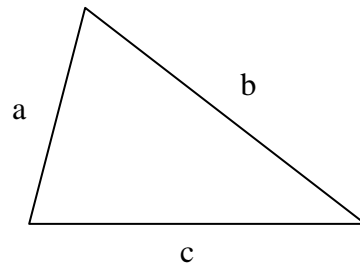
Write a program to calculate and display the area of a triangle.

The user will enter the sides a, b, and c from the keyboard.

The followings are the necessary formulae (S is semiperimeter, A is area):

$$S = \frac{a + b + c}{2}$$

$$A = \sqrt{S(S-a)(S-b)(S-c)}$$



/ This program has errors */*

```
#include <stdio.h>

main()
{
    int a, b, c;
    float S, A;

    printf("Please enter a , b , c : ");
    scanf("%d %d %d", a, b, c);

     $\frac{a + b + c}{2} = S;$ 

    a+b+c/2 = S;

    S = a+b+c/2;

     $A = \sqrt{S(S-a)(S-b)(S-c)};$ 

     $A^2 = S.(S-a).(S-b).(S-c);$ 

     $\sqrt{S.(S-a).(S-b).(S-c)} = A;$ 

    A.A = S.(S-a).(S-b).(S-c);

    printf(" Area is : %f A ");

    printf(" Area is : “ , A);

}
```

/ This program is correct */*

```
#include <stdio.h>
#include <math.h> // For the sqrt func.

main()
{
    int a, b, c;
    float S, A;

    printf("Please enter a , b , c :");
    scanf("%d %d %d", &a, &b, &c);

    S = (a+b+c) / 2.0;

    A = sqrt( S*(S-a)*(S-b)*(S-c) );

    printf(" Area is : %f \n “ , A );

}
```

Question-3)

Write a program to calculate and display the following sum of series.
The user will enter the N value.

$$\theta = \sum_{k=1}^N k$$

/ This program has errors */*

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

```
main()
```

```
{
```

```
    int k,N, θ;
```

```
    printf("Please enter N value :);
```

```
    scanf("%d", &N);
```

$$\theta = \sum_{k=1}^N k;$$

```
    θ = 1 + 2 + 3 + 4 + . . . . + N ;
```

```
    printf(" Sum of series is : %d" , θ );
}
```

/ This program is correct */*

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

```
main()
```

```
{
```

```
    int k, N, Teta ;
```

```
    printf("Please enter N value :);
```

```
    scanf("%d", &N);
```

```
    Teta = 0; // Initialization
```

```
    for (k=1 ; k <= N ; k++)
```

```
    {
```

```
        Teta = Teta + k;
```

```
    }
```

```
    printf(" Sum of series is : %d" , Teta );
}
```

Question-4)

F is a partial function defined as the following:
Write a program to calculate and display the F value.
The user will enter the X value.

$$F(X) = \left\{ \begin{array}{ll} \frac{x-2}{5} & \text{for } x < -5 \\ 3x+1 & \text{for } -5 \leq x \leq 8 \\ 6 & \text{for } x > 8 \end{array} \right\}$$

/ This program has errors */*

```
#include <stdio.h>

main()
{
    int x;
    float F;

    printf("Please enter X value :");
    scanf("%d", &X);

    if (x < -5)
        F(X) = [x-2] / 5 ;

    if (-5 ≤ x ≤ 8 )
        F(X) = 3x+1 ;

    if (x >8)
        F(X) = 6 ;

    printf(" F(X) : %f" , F(X));
}
```

/ This program is correct */*

```
#include <stdio.h>

main()
{
    int x;
    float F;

    printf("Please enter X value :");
    scanf("%d", &X);

    if (x < -5)
        F = (x-2) / 5.0 ;

    if (x >= -5 && x <= 8)
        F = 3*x+1 ;

    if (x > 8)
        F = 6 ;

    printf(" F(X) : %f" , F);
}
```

Question-5)

Assume that you have the following data file which contains student numbers, student names, and grades. Write a program which reads the data file and calculates the average of grades.

The *students.txt* File (with example data)

```
040010271 Didem Demir 78
040010403 Mustafa Bulut 85
040010405 Ahmet Baki 89
040010406 Aslı Sabancı 94
. . . . .
```

```
/* This program has errors */
#include <stdio.h>

int main()
{
    int OgrNum, OgrNotu;
    char OgrAd, OgrSoyad;

    FILE * fOgr; // File pointer

    fOgr = fopen("students.txt", "r");

    for (i = 1 ; i <= 4 ; i++ )
    {
        fscanf(fOgr, "%d %s %s %d", &OgrNum,
                                     OgrAd, OgrSoyad,
                                     &OgrNotu);
    }

    toplam = 78 + 85 + 89 + 94;

    printf("Ortalama : %f \n “ , toplam / 4);

    return 0;
}
```

```

/* This program is correct */

#include <stdio.h>

int main()
{
    int OgrNum, OgrNotu;
    char OgrAd[10], OgrSoyad[10];

    FILE * fOgr; // File pointer

    int toplam = 0, sayac=0; // Initializations

    fOgr = fopen("students.txt", "r");

    if (fOgr == NULL)
    {
        printf("Dosya bulunamadi veya acilamadi..\n");
        return -1;
    }

    while (! feof (fOgr) ) // Checking whether end of file
    {
        fscanf(fOgr, "%d %s %s %d", &OgrNum,
                                     OgrAd, OgrSoyad,
                                     &OgrNotu);

        toplam = toplam + OgrNotu;
        sayac++;
    }

    if (sayac == 0)
        printf("Dosya boş, hiç kayıt yok \n");
    else
        printf("Ortalama : %f \n ", (float) toplam / sayac);

    fclose(fOgr);
    return 0;
}

```

Question-6)

Write a program which calculates and displays the projected populations of a country for the next N years.

The user will enter the followings:

- Current country population (for example 70 000 000)
- Percentage of population growth (for example 2.3)
- Number of years (N) for projection (for example 15)

The output of the program should be like the following:

Year	Population
=====	=====
2009	70000000
2010	71610000
2011	73257030
...

```
/* This program has errors */
#include <stdio.h>

int main()
{
    int Pop;
    float Growth;
    int N, i;

    printf("Enter current population : "); scanf("%ld", &Pop);
    printf("Enter growth rate      : "); scanf("%f", &Growth);
    printf("Enter number of years  : "); scanf("%d", &N);

    printf("\n");

    for (i=0 ; i <= N ; i++)
    {
        Pop = Pop * Growth / 100 ;
    }

    printf("Year   Population \n");
    printf("=====  ===== \n");
    printf("%d \t %ld \n", N, Pop);

    return 0;
}
```

```

/* This program is correct */

#include <stdio.h>

int main()
{
    unsigned long int Pop;
    float Growth;
    unsigned int N, i;

    printf("Enter current population : "); scanf("%ld", &Pop);
    printf("Enter growth rate      : "); scanf("%f", &Growth);
    printf("Enter number of years   : "); scanf("%d", &N);

    printf("\n");

    printf("Year   Population \n");
    printf("====   ===== \n");

    for (i=0 ; i <= N ; i++)
    {
        printf("%d \t %ld \n", (2009 + i), Pop );
        Pop = Pop + (Pop * Growth / 100 );
    }

    return 0;
}

```