

CSE ASSIGNMENT 1 - 125012012

Problem 1

Question:

Write a C program to calculate Compound Interest and simple Interest

Code:

Part - 1 -> Simple Interest:

```
// Write a C program to calculate Simple Interest
// To instantly test this code, copy it and go over to https://replit.com/languages/c

// Include the input and output helper header file
#include <stdio.h>

// Code execution starts here
int main()
{
    // Variables used to store principal, number of years and rate are declared here
    int p, n, r;

    // Getting the values and putting them into variables
    // {
    printf("Enter the principal value : ");
    scanf("%d", &p);

    printf("\nEnter the number of years : ");
    scanf("%d", &n);

    printf("\nEnter rate of interest : ");
    scanf("%d", &r);
    // }

    // Calculate the output and dump it into stdout stream
    printf("\nThe simple interest is : %d", (p * n * r)/100);

    // Exit with value zero to show execution was successful
    return 0;
}
```

Output - 1:

```
$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter the principal value : 1250

Enter the number of years : 7

Enter rate of interest : 10

The simple interest is : 875
```

Part - 2 -> Compound Interest:

```
// Write a C program to calculate Compound Interest
// To instantly test this code, copy it and go over to https://replit.com/languages/c

// Include the input and output helper header file
#include <stdio.h>
// Include the math helper header, we use the power function in this program
#include <math.h>

// Code execution starts here
int main()
{
    // Variables used to store the principal, number of years, and rate
    int p, n, r;

    // Get the input from the user and store it in the variables
    // {
    printf("Enter the principal vaue : ");
    scanf("%d", &p);

    printf("\nEnter the number of years : ");
    scanf("%d", &n);

    printf("\nEnter the rate of interest : ");
    scanf("%d", &r);
    // }

    // Calculate the output and dump it into stdout stream
    printf("\nThe compound interest is : %f", p*pow((1+((float)r/100)), n));

    // Exit with value zero to show execution was successful
    return 0;
}
```

Output - 2:

```
$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter the principal vaue : 1250
```

Enter the number of years : 7

Enter the rate of interest : 10

The compound interest is : 2435.896745

Two Parts Combined:

```
// Write a C program to calculate Simple Interest
// To instantly test this code, copy it and go over to https://replit.com/languages/c

// Include the input and output helper header file
#include <stdio.h>
// Include Math functions
#include <math.h>

// Code execution starts here
int main()
{
    // Variables used to store principal, number of years and rate are declared here
    int p, n, r;

    // Getting the values and putting them into variables
    // {
    printf("Enter the principal value : ");
    scanf("%d", &p);

    printf("\nEnter the number of years : ");
    scanf("%d", &n);

    printf("\nEnter rate of interest : ");
    scanf("%d", &r);
    // }

    // Calculate the output and dump it into stdout stream
    // {
    printf("\nThe simple interest is : %d", (p * n * r)/100);
    printf("\nThe compound interest is : %f", p * pow((1+((float)r/100)), n));
    // }

    // Exit with value zero to show execution was successful
    return 0;
}
```

Output - 3:

```
$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter the principal value : 1250
```

Enter the number of years : 7

Enter rate of interest : 10

The simple interest is : 875

The compound interest is : 2435.896745

Problem 2

Question:

Write a C program to check alphabet, digit or special character using ASCII value

Code:

```
// Write a C program to check whether the given input character is an alphabet,  
// or a number or a special character using ASCII value  
  
// To instantly test this code, copy it and go over to https://replit.com/languages/c  
  
// Include the input and output helper header file  
#include <stdio.h>  
  
// Code execution starts here  
int main()  
{  
    // Variable used to store the character passed  
    char inp;  
  
    // Getting input and converting it to an ASCII value  
    // {  
    printf("Enter a character : ");  
    scanf("%c", &inp);  
  
    inp = (int) inp;  
    // }  
  
    // Perform checks with ASCII values and dump a response to stdout  
    // {  
    if (inp > 47 && inp < 58)  
    {  
        printf("It's a number");  
    }  
    else if ((inp > 96 && inp < 123) || (inp > 64 && inp < 91))  
    {  
        printf("It's an alphabet");  
    }  
}
```

```
}  
else if ((inp > 32 && inp < 126))  
{  
    printf("It's a special character");  
}  
else  
{  
    printf("It's probably not an ASCII character");  
}  
// }  
  
// Exit with the value 0 to show that the program exited with zero errors  
return 0;  
}
```

Output - 1:

```
$ clang-7 -pthread -lm -o main main.c  
$ ./main  
Enter a character : a  
It's an alphabet
```

Output - 2:

```
$ clang-7 -pthread -lm -o main main.c  
$ ./main  
Enter a character : 5  
It's a number
```

Output - 3:

```
$ clang-7 -pthread -lm -o main main.c  
$ ./main  
Enter a character : !  
It's a special character
```

Output - 4:

```
$ clang-7 -pthread -lm -o main main.c  
$ ./main  
Enter a character : i  
It's probably not an ASCII character
```

Problem 3

Question:

Write a C program to check whether a triangle is Equilateral, Isosceles or Scalene

Code:

```
// Write a C program to check if a triangle is equilateral, or isosceles or scalene
// To instantly test this code, copy it and go over to https://replit.com/languages/c

// Include the input and output helper header file
#include <stdio.h>

// Code execution starts here
int main()
{
    // Use an array to store sides
    int sides[3];

    // Use a loop to get values of angles
    for (int i = 0; i < 3; i++)
    {
        printf("Enter side length %d : ", i + 1);
        scanf(" %d", &sides[i]);
    }

    // Check conditions can dump output to stdout
    if ((sides[0] == sides[1]) && (sides[1] == sides[2]))
    {
        printf("The given triangle is an equilateral triangle");
    }
    else if ((sides[0] == sides[1]) || (sides[1] == sides[2]) || (sides[2] == sides[0]))
    {
        printf("The given triangle is an isosceles triangle");
    }
    else
    {
        printf("The given triangle is a scalene triangle");
    }

    // Exit with value zero to show execution was successful
    return 0;
}
```

Output - 1:

```
$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter side length 1 : 4
```

```
Enter side length 2 : 4
Enter side length 3 : 4
The given triangle is an equilateral triangle
```

Output - 2:

```
$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter side length 1 : 2
Enter side length 2 : 2
Enter side length 3 : 7
The given triangle is an isosceles triangle
```

Output - 3:

```
$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter side length 1 : 3
Enter side length 2 : 5
Enter side length 3 : 7
The given triangle is a scalene triangle
```

Problem 4

Question:

Write a C program to check whether a triangle is valid or not if angles are given

Code:

```
// Write a C program to check if the given angles make a triangle
// To instantly test this code, copy it and go over to https://replit.com/languages/c

// Include the input and output helper header file
#include <stdio.h>

// Code execution starts here
int main()
{
    // Use an array to store angles
    int angles[3];

    // Use a loop to get values of angles
    for (int i = 0; i < 3; i++)
    {
        printf("Enter angle %d : ", i + 1);
```

```

        scanf("%d", angles + i);
    }

    // Check if the angles can make a triangle and dump output to stdout
    if ((*angles + *(angles + 1) + *(angles + 2)) == 180)
    {
        printf("These angles can form a triangle");
    }
    else
    {
        printf("These angles can't form a triangle");
    }

    // Exit with value zero to show execution was successful
    return 0;
}

```

Output - 1:

```

$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter angle 1 : 45
Enter angle 2 : 45
Enter angle 3 : 90
These angles can form a triangle

```

Output - 2:

```

$ clang-7 -pthread -lm -o main main.c
$ ./main
Enter angle 1 : 120
Enter angle 2 : 17
Enter angle 3 : 45
These angles can't form a triangle

```

Optional Problem

Question:

Write a C program to calculate the area of a circle, triangle and a square

Code:

```

// Write a C program to calculate the area of a circle, triangle and a square
// To instantly test this code, copy it and go over to https://replit.com/languages/c
// All inputs are optional, feel free to just press enter when you don't wanna give an input

```



```

// Include the input and output helper header file
#include <stdio.h>
// Include math helper functions
#include <math.h>

// Code execution starts here
int main()
{
    // Use an array to store values
    // {
    int vals[3];
    char labels[3][7] = {"radius\0", "base\0", "height\0"}, temp[8];
    // }

    // Use a loop to get values
    for (int i = 0; i < 3; i++)
    {
        printf("Enter %s : ", labels[i]);
        if (sscanf(fgets(temp, 7, stdin), "%d", vals + i) == 1) // Allow the user to
just press <enter> when they don't wanna enter a value
        {
        }
        else
        {
            vals[i] = 0;
        }
    }

    // Check what can be calculated and dump the result to stdout
    // {
    if (vals[0] != 0)
    {
        printf("\nThe area of a circle of radius %d is : %f", vals[0], 3.14 *
pow((float)vals[0], 2));
    }

    if ((vals[1] != 0) && (vals[2] != 0))
    {
        printf("\nThe area of a triangle of base %d and height %d is : %d", vals[1],
vals[2], (vals[1] * vals[2])/2);
    }

    if (vals[1] != 0)
    {
        printf("\nThe area of a square of side %d is : %d", vals[1], (int)pow(vals[1],
2));
    }
    // }

    // Exit with value zero to show execution was successful

```

```
    return 0;  
}
```

Output :

There are a lot of possible outputs possible for this program, I am including only one

```
$ clang-7 -pthread -lm -o main main.c  
$ ./main  
Enter radius : 12  
Enter base : 5  
Enter height : 4  
  
The area of a circle of radius 12 is : 452.160000  
The area of a triangle of base 5 and height 4 is : 10  
The area of a square of side 5 is : 25
```
