

## ES202

### Assignment-III

#### C Programming Exercises

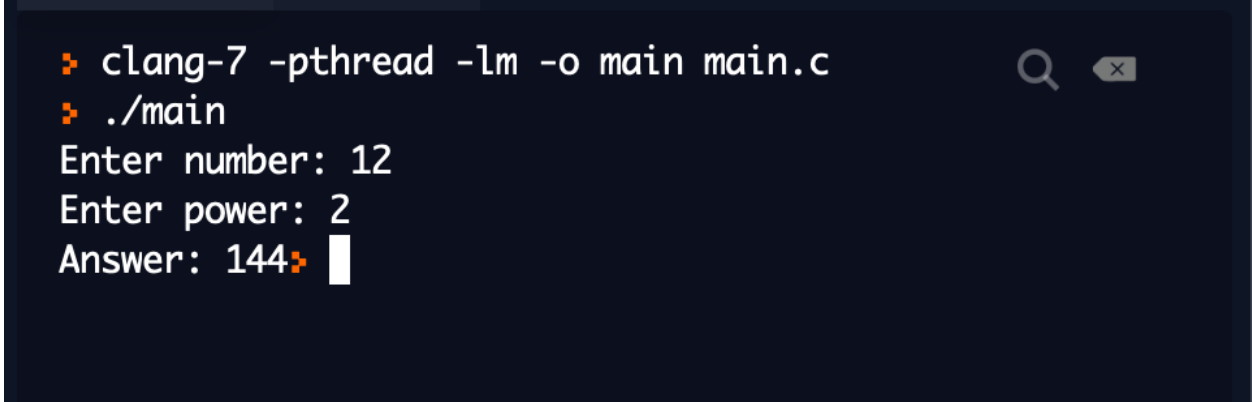
1. Write a C program to find power of a number using for loop.

Source Code:

```
#include <stdio.h>
void main()
{
    int n,pow,answer=1;
    printf("Enter number: ");
    scanf("%d",&n);
    printf("Enter power: ");
    scanf("%d",&pow);

    for(int i=1;i<=pow;i++)
        answer*=n;
    printf("Answer: %d",answer);
}
```

Output:

A terminal window with a dark background. It shows the compilation and execution of a C program. The commands entered are 'clang-7 -pthread -lm -o main main.c' and './main'. The program prompts for 'Enter number: 12' and 'Enter power: 2', then outputs 'Answer: 144'.

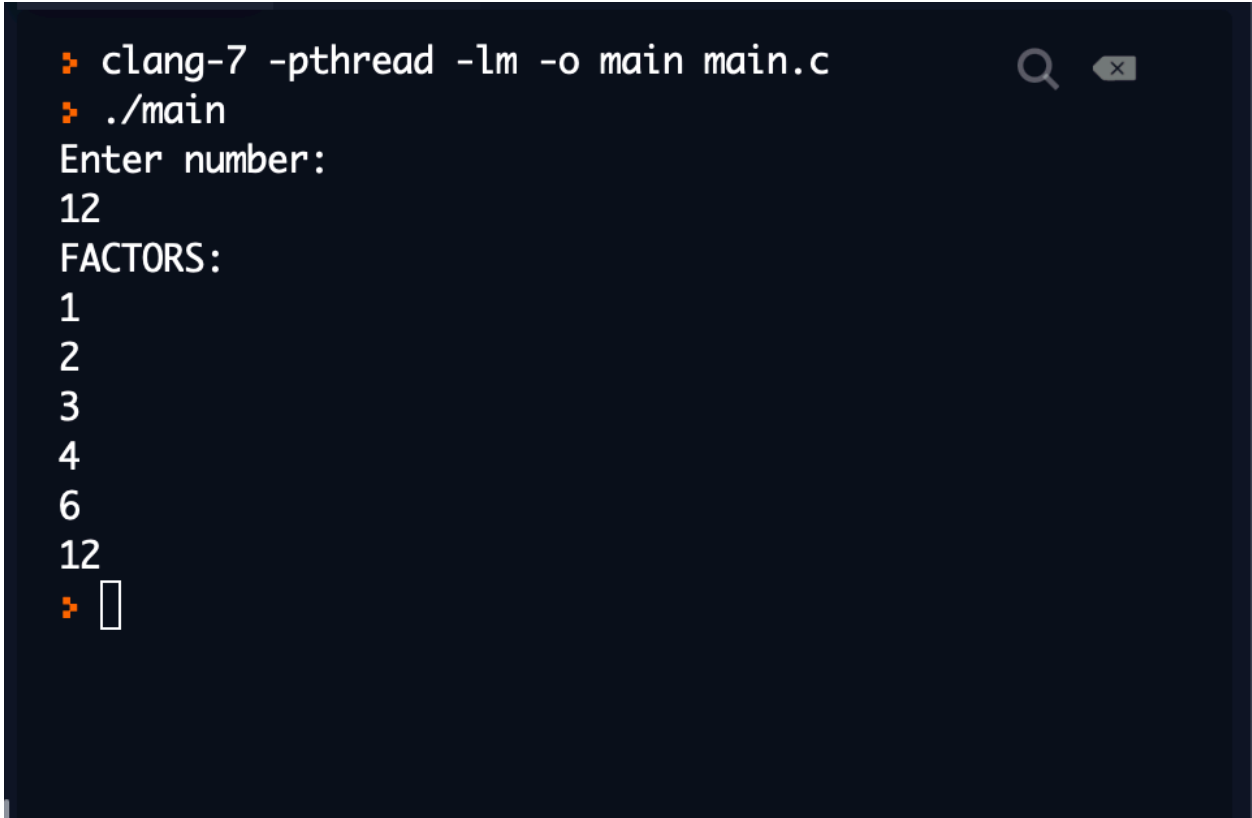
```
> clang-7 -pthread -lm -o main main.c
> ./main
Enter number: 12
Enter power: 2
Answer: 144
```

2. Write a C program to find all factors of a number.

Source Code:

```
#include <stdio.h>
void main()
{
    int n;
    printf("Enter number:\n ");
    scanf("%d",&n);
    printf("FACTORS: \n");
    for(int i=1;i<=n;i++)
        if(n%i==0)
            printf("%d \n",i);
}
```

Output:

A terminal window with a dark background. The prompt is a green star. The command 'clang-7 -pthread -lm -o main main.c' is entered. The prompt is a green star. The command './main' is entered. The output is 'Enter number:' followed by '12' on the next line. Then 'FACTORS:' is printed, followed by a list of factors: '1', '2', '3', '4', '6', and '12' on separate lines. The prompt is a green star followed by a white rectangular box.

```
❖ clang-7 -pthread -lm -o main main.c
❖ ./main
Enter number:
12
FACTORS:
1
2
3
4
6
12
❖ □
```

3. Write a C program to find HCF (GCD) of two numbers.

Source Code:

```
#include <stdio.h>
int main()
{
    int n1, n2;

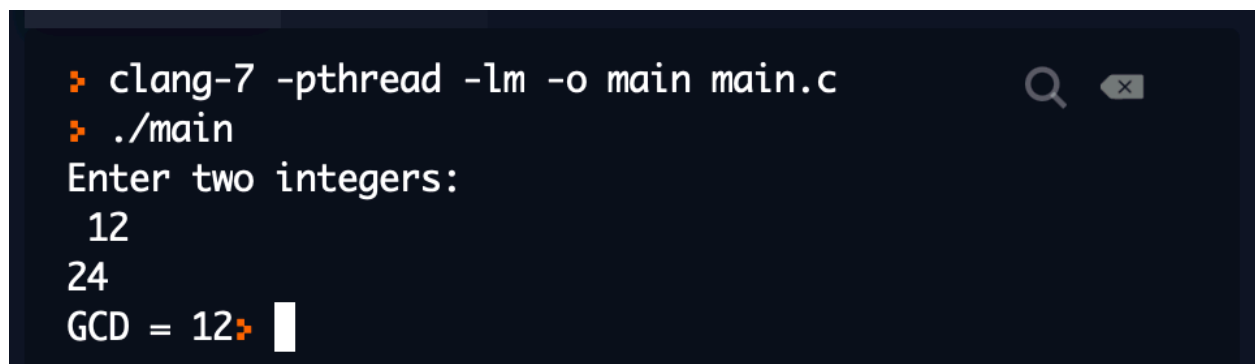
    printf("Enter two integers: ");
    scanf("%d %d",&n1,&n2);

    n1 = ( n1 > 0 ) ? n1 : -n1;
    n2 = ( n2 > 0 ) ? n2 : -n2;

    while(n1!=n2)
    {
        if(n1 > n2)
            n1 -= n2;
        else
            n2 -= n1;
    }
    printf("GCD = %d",n1);

    return 0;
}
```

Output:

A terminal window with a dark background. The first two lines show the compilation command: `clang-7 -pthread -lm -o main main.c` and the execution command: `./main`. The program then prompts "Enter two integers:". The user enters "12" on the next line and "24" on the following line. The program outputs "GCD = 12" followed by a cursor. In the top right corner of the terminal, there is a magnifying glass icon and a close button (an 'x' in a square).

4. Write a C program to find LCM of two numbers.

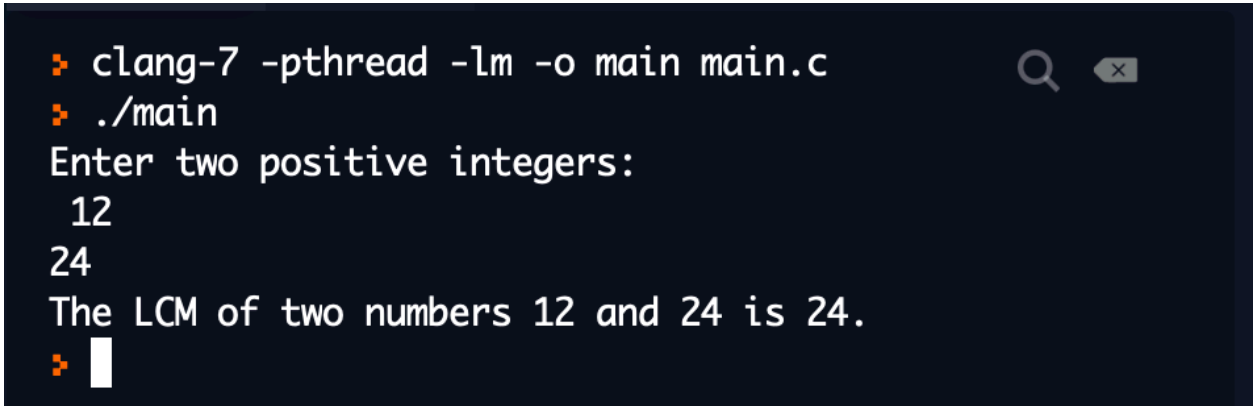
Source Code:

```
#include <stdio.h>
int main() {
    int n1, n2, gcd;
    printf("Enter two positive integers:\n ");
    scanf("%d", &n1);
    scanf("%d",&n2);

    for (int i = 1; i <= n1 && i <= n2; ++i)
    {

        if (n1 % i == 0 && n2 % i == 0)
            gcd = i;
    }
    printf("The LCM of two numbers %d and %d is %d. \n", n1, n2, ((n1 * n2) / gcd));
    return 0;
}
```

Output:

A terminal window with a dark background and light-colored text. It shows the compilation and execution of a C program. The commands entered are 'clang-7 -pthread -lm -o main main.c' and './main'. The program prompts for two positive integers, and the user enters '12' and '24'. The program then outputs 'The LCM of two numbers 12 and 24 is 24.' followed by a cursor.

```
> clang-7 -pthread -lm -o main main.c
> ./main
Enter two positive integers:
12
24
The LCM of two numbers 12 and 24 is 24.
> 
```

5. Write a C program to find all prime factors of a number.

**Source Code:**

```
#include <stdio.h>
int main()
{
    int num, isPrime;

    printf("Enter any number to print Prime factors: ");
    scanf("%d", &num);

    printf("All Prime Factors of %d are: \n", num);

    for(int i=2; i<=num; i++)
    {
        if(num%i==0)
        {
            isPrime = 1;
            for(int j=2; j<=i/2; j++)
            {
                if(i%j==0)
                {
                    isPrime = 0;
                    break;
                }
            }
            if(isPrime==1)
            {
                printf("%d ", i);
            }
        }
    }

    return 0;
}
```

**Output:**

```
❏ clang-7 -pthread -lm -o main main.c
```



```
❏ ./main
```

Enter any number to print Prime factors: 12345

All Prime Factors of 12345 are:

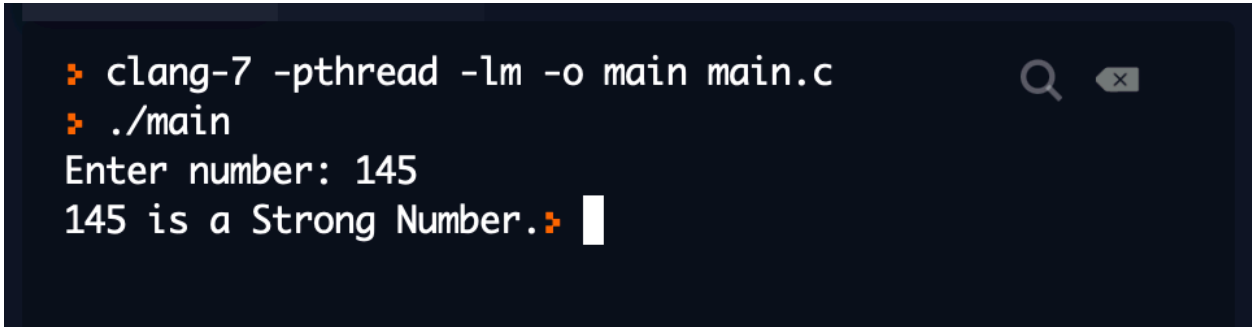
```
3 5 823 ❏
```

6. Write a C program to check whether a number is Strong number or not.

Source Code:

```
#include <stdio.h>
int fact(int a)
{
    int ans=1;
    for(int i=a;i>=1;--i)
        ans*=i;
    return ans;
}
int main()
{
    int n,s=0;
    printf("Enter number: \n");
    scanf("%d",&n);
    int t=n;
    while(t!=0)
    {
        int c=t%10;
        s+=fact(c);
        t/=10;
    }
    if(n==s)
        printf("%d is a Strong Number. \n",n);
    else
        printf("%d is not a Strong Number. \n",n);
}
```

Output:



```
❖ clang-7 -pthread -lm -o main main.c
❖ ./main
Enter number: 145
145 is a Strong Number.❖
```

7. Write a C program to print all Strong numbers between 1 to n.

Source Code:

```
#include <stdio.h>
int fact(int a)
{
    int ans=1;
    for(int i=a;i>=1;--i)
        ans*=i;
```



```

        return ans;
    }
void Strong(int t)
{
    int nn=t,s=0;
    while(t!=0)
    {
        int c=t%10;
        s+=fact(c);
        t/=10;
    }
    if(nn==s)
        printf("%d ",nn);

}
int main()
{
    int n;
    printf("Enter limit: ");
    scanf("%d",&n);
    for(int i=1;i<=n;++i)
        Strong(i);
}

```

Output:

```

❏ clang-7 -pthread -lm -o main main.c
❏ ./main
Enter limit: 145
1 2 145 ❏

```

8. Write a C program to convert Hexadecimal to Decimal number system.

Source Code:

```
#include<stdio.h>
#include<math.h>
int main()
{
    int dn=0;
    int c=0,l=0,i=0;
    char hdn[20];

    printf("Enter a Hexadecimal Number:");
    scanf("%s",hdn);
    while(hdn[i]!='\0')
```

```

{
    l++;
    i++;
}
l--;
i=0;
while(l>=0)
{
    c=hdn[l];
    if(c>=48&& c<=57)
        c=c-48;

    else if(c>=97&& c<=102)
        c=c-97+10;

    else if(c>=65&& c<=70)
        dn=c-65+10;

    dn=dn+(c*pow(16,i));
    l--;
    i++;
}
printf("\nDecimal Equivalent:\n %d",dn);
return 0;
}

```

Output:

```

❏ clang-7 -pthread -lm -o main main.c
❏ ./main
Enter a Hexadecimal Number:ABCD

Decimal Equivalent:
266250❏

```

9. Write a C program to input week number and print week day.

Source Code :

```
#include <stdio.h>
int main()
{
    char w[8][10]={"MONDAY","TUESDAY","WEDNESDAY","THURSDAY","FRIDAY",
"SATURDAY","SUNDAY"}; int n;
    printf("Enter day number: ");
    scanf("%d",&n);
    printf("%s",w[n-1]);

}
```

Output:

```
❏ clang-7 -pthread -lm -o main main.c
```

```
❏ ./main
```

```
Enter day number: 4
```

```
THURSDAY❏
```

10. Write a C program to input marks of five subjects Physics, Chemistry, Biology, Mathematics and Computer. Calculate percentage and grade according to following:

Percentage	>=	90%	:	Grade	A
Percentage	>=	80%	:	Grade	B
Percentage	>=	70%	:	Grade	C
Percentage	>=	60%	:	Grade	D
Percentage	>=	40%	:	Grade	E

Percentage < 40% : Grade F

Source Code:

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

```
int main()
```

```
{
```

```
    float m1,m2,m3,m4,m5,p;
```

```
    printf("Enter marks in Physics out of 100: ");
```

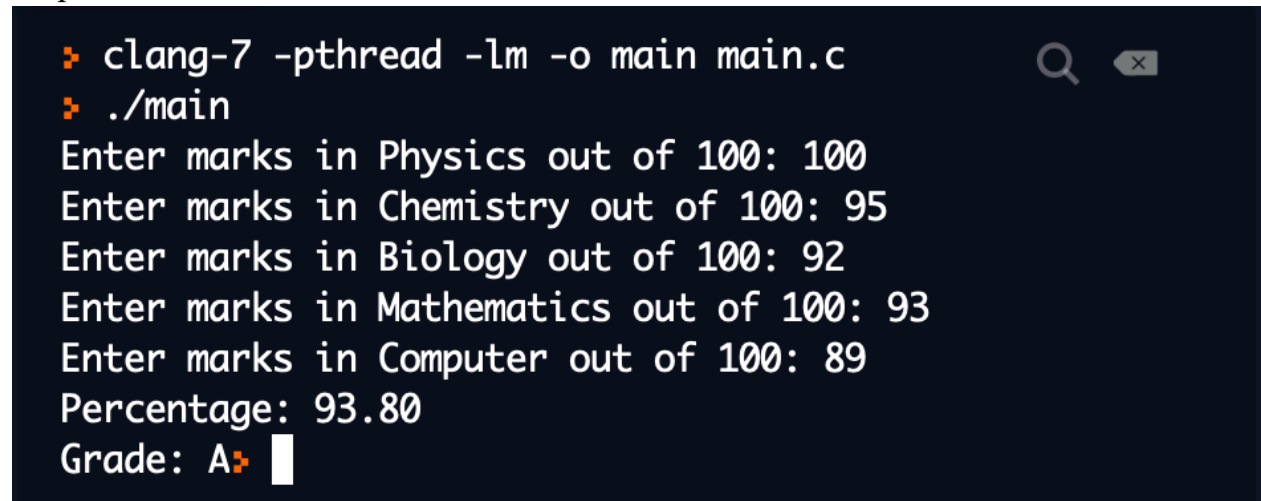
```
    scanf("%f",&m1);
```

```

printf("Enter marks in Chemistry out of 100: ");
scanf("%f",&m2);
printf("Enter marks in Biology out of 100: ");
scanf("%f",&m3);
printf("Enter marks in Mathematics out of 100: ");
scanf("%f",&m4);
printf("Enter marks in Computer out of 100: ");
scanf("%f",&m5);
p=(m1+m2+m3+m4+m5)/500.0*100.0;
if(p>=90)
    printf("Percentage: %.2f\nGrade: A",p);
else if(p>=80)
    printf("Percentage: %.2f\nGrade: B",p);
else if(p>=70)
    printf("Percentage: %.2f\nGrade: C",p);
else if(p>=60)
    printf("Percentage: %.2f\nGrade: D",p);
else if(p>=40)
    printf("Percentage: %.2f\nGrade: E",p);
else
    printf("Percentage: %.2f\nGrade: A",p);
}

```

Output:



```

❖ clang-7 -pthread -lm -o main main.c
❖ ./main
Enter marks in Physics out of 100: 100
Enter marks in Chemistry out of 100: 95
Enter marks in Biology out of 100: 92
Enter marks in Mathematics out of 100: 93
Enter marks in Computer out of 100: 89
Percentage: 93.80
Grade: A

```