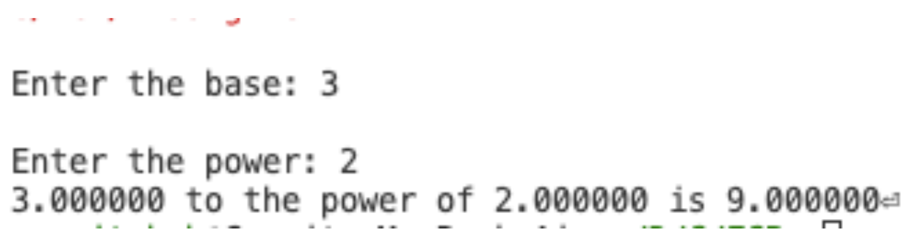
Assignment 7: Function

Garvit Shah
F24
U21CS089

1. Calculate x^y i.e pow(x,y) using recursion.

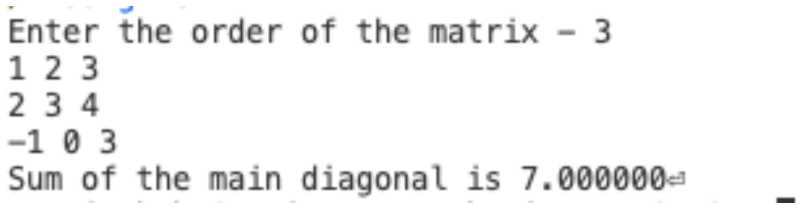
```c
// Q1
#include <stdio.h>
float power(float x, float y);

int main(){
    float x, y, a;
    printf("\nEnter the base: ");
    scanf("%f", &x);
    printf("\nEnter the power: ");
    scanf("%f", &y);
    a = power(x, y);
    printf("%f to the power of %f is %f", x, y, a);
}

float power(float x, float y){
    if (y == 0){
        return 1;
    }
    else{
        return x*power(x, y-1);
    }
}
```



```
Enter the base: 3

Enter the power: 2
3.000000 to the power of 2.000000 is 9.000000
```

2. Reads an n x n matrix and displays the sum of elements for the main diagonal.

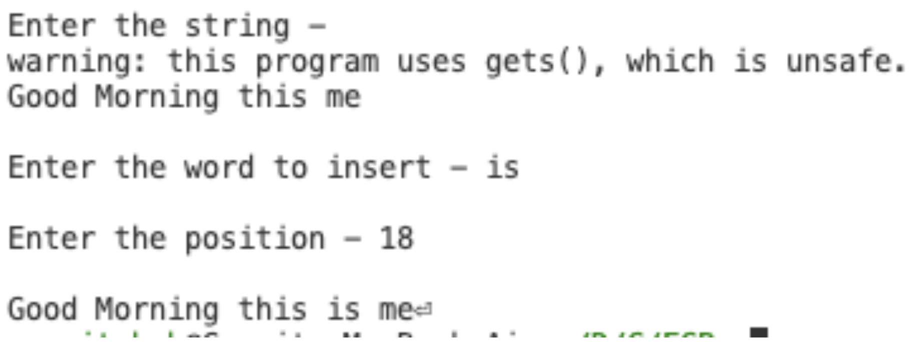
```c
// Q2
#include <stdio.h>
void matrix_diagonal(int n);

void matrix_diagonal(int n){
    int i, j;
    float m[n][n], sumD = 0;
    for(i=0;i<n;i++){
        for(j = 0;j<n;j++){
            scanf("%f", &m[i][j]);
            if(i==j){
                sumD += m[i][j];
            }
        }
    }
    printf("Sum of the main diagonal is %f", sumD);
}

int main(){
    int n;
    printf("Enter the order of the matrix - ");
    scanf("%d", &n);
    matrix_diagonal(n);
}
```



```
Enter the order of the matrix - 3
1 2 3
2 3 4
-1 0 3
Sum of the main diagonal is 7.000000
```

3. Insert a word in a string at a position given by the user.

```
// Q3
#include <stdio.h>
#include <string.h>

void insertWord(char str1[], char word[], int p){
    int a = 0, i=0, j=0;
    char str2[100];
    while(i!=(p-1)){
        str2[i] = str1[i];
        i+=1;
    }
    if (((str1[p-1]) == ' ') || ((str1[p-1]) == '\0')){
        str2[i] = ' ';
        i+=1;
    }

    while(word[j] != '\0'){
        str2[i] = word[j];
        j+=1;
        i+=1;
        a+=1;
    }
    str2[i] = ' ';
    j = i;
    j+=1;
    i-=a;
    while(str1[i] != '\0'){
        str2[j] = str1[i];
        j+=1;
        i+=1;
    }
    str2[j] = '\0';
    printf("\n%s", str2);

}


int main(){
    int p;
    char str1[100], word[100];
    printf("\nEnter the string - \n");
    gets(str1);
    printf("\nEnter the word to insert - ");
    scanf("%s", word);
    printf("\nEnter the position - ");
    scanf("%d", &p);
    insertWord(str1, word, p);
}
```

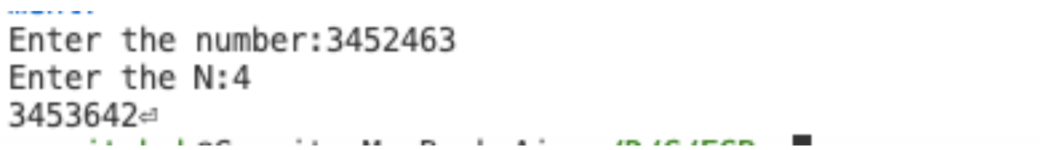


```
Enter the string -
warning: this program uses gets(), which is unsafe.
Good Morning this me

Enter the word to insert - is

Enter the position - 18

Good Morning this is me⏎
```

4. Implement a function named as flip; which will take a number as input and flip its last N digits. For example flip(123, 2)= 132 ; (here N=2) flip(12345,3)= 12543 (here N=3).

```
// Q4
#include <stdio.h>
#include <math.h>
void reversify(long long int number, int n);
int main()
{
    long long int num;
    printf("Enter the number:");
    scanf("%lld", &num);

    int N;
    printf("Enter the N:");
    scanf("%d", &N);
    reversify(num, N);
    // printf("\n Final - %d", result);
}
```

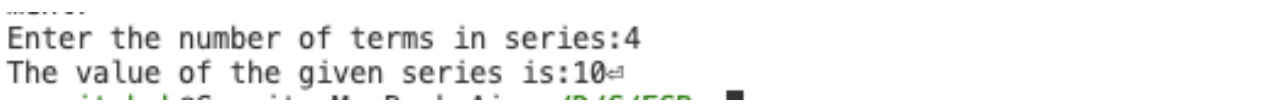
```c
void reversify(long long int number, int n)
{
    long long int num = number/pow(10, n);
    num*= pow(10,n);
    long long int rem = number - num;
    long long int rem1 =0;
    for(int i=(n-1);rem>0;i--){
        int k=0;
        k = rem%10;
        k=k*pow(10, i);
        rem1 += k;
        rem = rem/10;
    }
    num += rem1;
    printf("%lld", num);
}
```



```
Enter the number:3452463
Enter the N:4
3453642⏎
```

5. Write a program in C to find the sum of the series 1!/1+2!/2+3!/3+4!/4+5!/5 using the function.

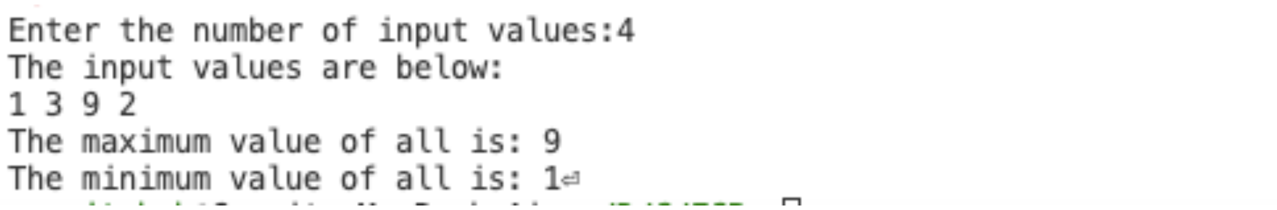
```c
// Q5
#include <stdio.h>
int series(int x);
int main()
{
    int a;
    printf("Enter the number of terms in series:");
    scanf("%d", &a);
    printf("The value of the given series is:%d", series(a));
    return 0;
}
int series(int x)
{
    int i, j = 1, fact = 1;
    for (int i = 2; i <= x; i++)
    {
        fact = fact * (i);
        j = j + (fact / i);
    }

    return j;
}
```



```
Enter the number of terms in series:4
The value of the given series is:10⏎
```

6. Write a C program to find out the maximum and minimum of some values using a function which will return an array.

```
// Q6
#include <stdio.h>
int *max_min(int array[], int z);
int main()
{

    int i, n;
    int arr[100];
    int *p;
    printf("Enter the number of input values:");
    scanf("%d", &n);
    printf("The input values are below:\n");
    for (i = 0; i < n; i++)
    {
        scanf("%d", &arr[i]);
    }
    p = max_min(arr, n);

    printf("The maximum value of all is: %d\n", p[0]);
    printf("The minimum value of all is: %d", p[1]);
}
int *max_min(int array[], int z)
{
    int i;
    static int mm[2];
    mm[0] = array[0];
    mm[1] = array[0];
    for (i = 1; i < z; i++)
    {
        if (mm[0] < array[i])
        {
            mm[0] = array[i];
        }
        if (mm[1] > array[i])
        {
            mm[1] = array[i];
        }
    }
    return &mm[0];
}
```



```
Enter the number of input values:4
The input values are below:
1 3 9 2
The maximum value of all is: 9
The minimum value of all is: 1⏎
```