Recursion in C Language

1. Write a recursive function to print first N natural numbers

```c
#include <stdio.h>
void naturalNumbers(int);
int main()
{
    int n;
    printf("Enter a number : ");
    scanf("%d", &n);
    naturalNumbers(n);
    return 0;
}
// below function is to print n natural numbers
void naturalNumbers(int x)
{
    if (x > 0)
    {
        naturalNumbers(x - 1);
        printf("%d ", x);
    }
}
```

```
================================================================================
Output:
Enter a number : 15
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
```

2. Write a recursive function to print first N natural numbers in reverse order

```c
#include <stdio.h>
void naturalNumbers(int);
int main()
{
    int n;
    printf("Enter a number : ");
    scanf("%d", &n);
    naturalNumbers(n);
    return 0;
}
// below function is to print n natural numbers
void naturalNumbers(int x)
{
    if (x > 0)
    {
        printf("%d ", x);
        naturalNumbers(x - 1);
    }
}
```

```
================================================================================
Output:
Enter a number : 10
10 9 8 7 6 5 4 3 2 1
```

3. Write a recursive function to print first N odd natural numbers

```c
#include <stdio.h>
void oddNumbers(int);
int main()
{
    int n;
    printf("Enter a number : ");
    scanf("%d", &n);
    oddNumbers(n);
    return 0;
}
// below function is to print n odd natural numbers
void oddNumbers(int x)
{
    if (x > 0)
    {
        oddNumbers(x - 1);
        printf("%d ", x * 2 - 1);
    }
}
```

```
================================================================================
Output:
Enter a number : 9
1 3 5 7 9 11 13 15 17
```

4. Write a recursive function to print first N odd natural numbers in reverse order

```c
#include <stdio.h>
void reverseOrder(int);
int main()
{
    int n;
    printf("Enter a number : ");
    scanf("%d", &n);
    reverseOrder(n);
    return 0;
}
// below function is to print n odd natural numbers in reverse order
void reverseOrder(int x)
{
    if (x > 0)
    {
        printf("%d ", x * 2 - 1);
        reverseOrder(x - 1);
    }
}
```

```
================================================================================
Output:
Enter a number : 6
11 9 7 5 3 1
```

5. Write a recursive function to print first N even natural numbers

```c
#include <stdio.h>
void evenNumbers(int);
int main()
{
    int n;
    printf("Enter a number : ");
    scanf("%d", &n);
    evenNumbers(n);
    return 0;
}
// below function is to print n even natural numbers
void evenNumbers(int x)
{
```

```
    if (x > 0)
    {
        evenNumbers(x - 1);
        printf("%d ", x * 2);
    }
}
================================================================================
Output:
Enter a number : 10
2 4 6 8 10 12 14 16 18 20
```

6. Write a recursive function to print first N even natural numbers in reverse order

```
#include <stdio.h>
void reverseOrder(int);
int main()
{
    int n;
    printf("Enter a number : ");
    scanf("%d", &n);
    reverseOrder(n);
    return 0;
}
// below function is to print n even natural numbers in reverse order
void reverseOrder(int x)
{
    if (x > 0)
    {
        printf("%d ", x * 2);
        reverseOrder(x - 1);
    }
}
================================================================================
Output:
Enter a number : 7
14 12 10 8 6 4 2
```

7. Write a recursive function to print squares of first N natural numbers

```
#include <stdio.h>
void naturalNumberssquare(int);
int main()
{
    int n;
    printf("Enter a number : ");
    scanf("%d", &n);
    naturalNumberssquare(n);
    return 0;
}
// below function is to print square of n natural numbers
void naturalNumberssquare(int x)
{
    if (x > 0)
    {
        naturalNumberssquare(x - 1);
        printf("%d ", x * x);
    }
}
================================================================================
Output:
Enter a number : 5
1 4 9 16 25
```

8. Write a recursive function to print binary of a given decimal number

```c
#include <stdio.h>
int decimalBinary(int);
int main()
{
    int n, binary;
    printf("Enter a number to convert binary : ");
    scanf("%d", &n);
    binary = decimalBinary(n);
    printf("Decimal(%d) = Binary(%d)", n, binary);
    return 0;
}
// below function is conversion of decimal to binary
int decimalBinary(int x)
{
if (x == 0) return(0) ; else return (x % 2 + 10 * decimalBinary(x / 2));
}
```

```
================================================================================
Output:
Enter a number to convert binary : 125
Decimal(125) = Binary(1111101)
```

9. Write a recursive function to print octal of a given decimal number

```c
#include <stdio.h>
int decimalOctal(int);
int main()
{
    int n, binary;
    printf("Enter a number to convert octal : ");
    scanf("%d", &n);
    binary = decimalOctal(n);
    printf("Decimal(%d) = Octal(%d)", n, binary);
    return 0;
}
// below function is conversion of decimal to octal
int decimalOctal(int x)
{
if (x == 0) return(0) ; else return (x % 8 + 10 * decimalOctal(x / 8));
}
```

```
================================================================================
Output:
Enter a number to convert octal : 20
Decimal(20) = Octal(24)
```

10. Write a recursive function to print reverse of a given number

```c
#include <stdio.h>
int sum = 0, rem;
int reverse_function(int);
int main()
{
    int num, reverse_number;
    printf("Enter any number : ");
    scanf("%d", &num);
    reverse_number = reverse_function(num);
    printf("The reverse of entered number is %d", reverse_number);
    return 0;
}
// below function is reverse function
int reverse_function(int num)
{
    if (num)
    {
        rem = num % 10;
        sum = sum * 10 + rem;
```

```
        reverse_function(num / 10);
    }
    else
        return sum;
    return sum;
}
```

```
================================================================================
Output:
Enter any number : 214578
The reverse of entered number is 875412
```