Assignment - 12 A Job Ready Bootcamp in C++, DSA and IOT MySirG Recursion in C Language

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

Program -

```
#include <stdio.h>

void printN(int);

int main()
{
    int N;
    printf("Enter the value of N: ");
    scanf("%d",&N);
    printN(N);
    return 0;
}

void printN(int n)
{
    if(n > 0)
    {
        printN(n - 1);
        printf(" %d",n);
    }
}
```

Output -

Enter the value of N: 10
1 2 3 4 5 6 7 8 9 10

---

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

Program -

```
#include <stdio.h>

void printN(int);

int main()
{
    int N;
    printf("Enter the value of N: ");
    scanf("%d",&N);
    printN(N);
    return 0;
}
```

```
void printN(int n)
{
    if(n > 0)
    {
       printf("%d ",n);
       printN(n - 1);
    }
}
```

Output -
Enter the value of N: 10
10 9 8 7 6 5 4 3 2 1

---

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

Program -

```
#include <stdio.h>

void printOdd(int);

int main()
{
    int N;
    printf("Enter the value of N: ");
    scanf("%d",&N);
    printOdd(N);
    return 0;
}

void printOdd(int n)
{
    if(n > 0)
    {
        printOdd(n - 1);
        printf("%d ",2 * n - 1);
    }
}
```

Output -
Enter the value of N: 10
1 3 5 7 9 11 13 15 17 19

---

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

Program -

```
#include <stdio.h>

void printOdd(int);

int main()
{
    int N;
    printf("Enter the value of N: ");
    scanf("%d",&N);
    printOdd(N);
    return 0;
}

void printOdd(int n)
{
    if(n > 0)
    {
        printf("%d ",2 * n - 1);
        printOdd(n - 1);
    }
}
```

Output -

```
Enter the value of N: 20
39 37 35 33 31 29 27 25 23 21 19 17 15 13 11 9 7 5 3 1
```

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

Program -

```
#include <stdio.h>

void printEven(int);

int main()
{
    int N;
    printf("Enter the value of N: ");
    scanf("%d",&N);
    printEven(N);
    return 0;
}

void printEven(int n)
{
    if(n > 0)
```

```
    {
        printEven(n - 1);
        printf("%d ",2 * n);
    }
}
```

Output -
Enter the value of N: 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

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

void reverseEven(int);

int main()
{
    int N;
    printf("Enter the value of N: ");
    scanf("%d",&N);
    reverseEven(N);
    return 0;
}

void reverseEven(int n)
{
    if(n > 0)
    {
        printf("%d ",2 * n);
        reverseEven(n - 1);
    }
}
```

Output -
Enter the value of N: 6
12 10 8 6 4 2

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

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

void printSquare(int);

int main()
{
```

```
    int N;
    printf("Enter the value of N: ");
    scanf("%d",&N);
    printSquare(N);
    return 0;
}

void printSquare(int n)
{
    if(n > 0)
    {
        printSquare(n - 1);
        printf("%d ",n*n);
    }
}
```

Output -
Enter the value of N: 8
1 4 9 16 25 36 49 64

---

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

Program -

```
#include <stdio.h>

void printBinary(int);
int main()
{
    int N;
    printf("Enter a decimal number: ");
    scanf("%d",&N);
    printf("Binary of %d is\n",N);
    if(N == 0 || N == 1)
    {
        printf("%d",N);
        return 0;
    }
    printBinary(N);
    return 0;
}

void printBinary(int n)
{
   if(n > 0)
   {
       printBinary(n / 2);
       printf("%d",n % 2);
   }
}
```

Output -
Enter a decimal number: 9
Binary of 9 is
1001

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

Program -

```
#include <stdio.h>

void printOctal(int);

int main()
{
    int N;
    printf("Enter a decimal number: ");
    scanf("%d",&N);
    printf("Octal of %d is\n",N);
    if(N <= 7)
    {
        printf("%d",N);
        return 0;
    }
    printOctal(N);
    return 0;
}

void printOctal(int n)
{
   if(n > 0)
   {
       printOctal(n / 8);
       printf("%d",n % 8);
   }
}
```

Output -
Enter a decimal number: 123
Octal of 123 is
173

---

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

Program -

```
#include <stdio.h>

void printRev(int);
```

```
int main()
{
    int N;
    printf("Enter a number: ");
    scanf("%d",&N);
    printf("Reverse of %d is ",N);
    if(N <= 9)
    {
        printf("%d",N);
        return 0;
    }
    printRev(N);
    return 0;
}

void printRev(int n)
{
   if(n > 0)
   {
       printf("%d",n % 10);
       printRev(n / 10);
   }
}
```

Output -
Enter a number: 765
Reverse of 765 is 567