

16

Monday

136-229 - Week 20

MAY

16-05-2011

M	T	W	T	F	S	S
30	31	.	.	.	.	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

Recursion :

A function ^{which} call it self directly or indirectly again and again until the given condition is not satisfied. Recursive functions are used while constructing the data structure like linked list, doubly linked list, tree and graph.

There are two types of Recursion. These are:

- (i) primitive or direct Recursion.
- (ii) Non-primative or indirect Recursion.

(i) primitive or Direct Recursion

Syntax:

```
int x ( )
{
    _____
    _____
    _____
    x ( ) ;
}
```

Here, x () function call it self again and again, so, it is called direct recursion.

	M	T	W	T	F	S	S
	.	.	1	2	3	4	5
JUNE	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	.	.	.

17-05-2011

Tuesday
137-228 • Week 20

MAY

17

(ii) Indirect or Non-recursive Recursion.

Syntax:

```

int x(c)
{
    _____
    _____
    _____
    abc(c);
}

int abc(c)
{
    _____
    _____
    _____
    x(c);
}

```

Here x(c) function call the abc(c) function and then abc(c) function call x(c) function. So, indirectly x(c) function call its self again and again. Therefore, it is called indirect recursion.

	M	T	W	T	F	S	S
	.	.	1	2	3	4	5
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	.	.	.	

JUNE

Thursday
139-226 • Week 20

19

19-05-2011

MAY

Q.1. Write a C program to print the square of a number by using recursion.

Appointments Meetings

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

```
#include <conio.h>
```

```
int square(int);
```

```
int main()
```

```
{
```

```
int x, y;
```

```
clrscr();
```

```
printf("Enter a no.");
```

```
scanf("%d", &x);
```

```
y = square(x);
```

```
printf("%d", y);
```

```
getch();
```

```
return 0;
```

```
}
```

```
int square(int x)
```

```
{
```

```
if (x == 0)
```

```
return x;
```

```
else
```

```
return square(x-1) + (2*x) - 1;
```

```
}
```


M	T	W	T	F	S	S
30	31	.	.	.	.	.
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

Q4: Write a 'C' program to print the factorial of a number by using recursion.

Appointments Meetings

```
#include <stdio.h>
#include <conio.h>
int fact(int);
int s=1;
void main()
{
    int x, n;
    clrscr();
    printf("Enter a no");
    scanf("%d", &n);
    x = fact(n);
    printf("%d", x);
    getch();
}
```

```
int fact(int n)
{
    int i, p=1;
    if(n==0)
        return p;
    else
    {
        s = s * n;
        n--;
        fact(n);
    }
    return s;
}
```

Created By: Er. Raj kumar patel.

	M	T	W	T	F	S	S
	.	.	.	.	1	2	3
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	
25	26	27	28	29	30	31	

Tuesday
158-207 • Week 23

07

JUNE

07-06-2011

Q3: Write a 'C' program to print the sum of all digits of a given three digits number by using recursion.

Appointments and Meetings

```
#include <stdio.h>
#include <conio.h>
int sum(int);
int p=0;
void main()
{
    int x, s=0;
    printf("Enter a no");
    scanf("%d", &x);
    s = sum(x);
    printf("%d", s);
    getch();
}
```

```
int sum(int x)
{
    int d;
    if(x==0)
        return 0;
    else
    {
        d = x % 10;
        p = p + d;
        x = x / 10;
        sum(x);
    }
    return p;
}
```


	M	T	W	T	F	S	S
	.	.	1	2	3	4	5
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	.	.	.	

17-05-2011

Tuesday
137-228 • Week 20

MAY

17

(ii) Indirect or Non-recursive Recursion.

Syntax:

```

int x(c)
{
    _____
    _____
    _____
    abc(c);
}

int abc(c)
{
    _____
    _____
    _____
    x(c);
}

```

Here x(c) function call the abc(c) function and then abc(c) function call x(c) function. So, indirectly x(c) function call it self again and again. Therefore, it is called indirect recursion.

Created By: Er. Raj kumar Patel.

06

Monday

157-208 . Week 23

JUNE

Indirect Recursion

06-06-2011

M	T	W	T	F	S	S
.	.	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	.	.	.

JUNE

Q. Write a C program to print the first 20 integers by using indirect recursion.

Appointments ~ Meetings

```
#include <stdio.h>
#include <conio.h>
int n = 1;
void f1();
void f2();
int main()
{
```

```
clrscr();
f1();
getch();
return 0;
}
```

```
void f1()
{
```

```
if (n <= 20)
```

```
{
printf("%d", n);
```

```
n++;
```

```
f2();
}
```

```
void f2()
{
```

```
if (n <= 20)
```

```
{
printf("%d", n);
```

```
n++;
```

```
f1();
}
```

```
}
}
```

Nothing great is every achieved without enthusiasm