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ASSIGNMENT-6

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Subject Name :- C-programming for Reasoning

Subject Code :- ILC-SA0220

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1) Write a function to find the factorial of a number?

Ans: #include

```
int fact(int n){  
    if(n==0) return 1;  
    return n*fact(n-1);
```

```
} int main () {
```

```
    int n;  
    scanf("%d", &n);  
    printf("%d : fact(%d)",
```

Input:-
5
Output:-
120

2) Write a C program to check prime or not?

Ans: #include <stdio.h>

```
int prime(int n) {  
    for (int i=2; i<=n/2; i++)  
        if (n/i==0) return 0;  
    return 1;
```

```
} int main () {
```

```
    int n;  
    scanf("%d", &n);  
    if (prime(n)) printf("Prime");  
    else printf("Not prime");
```

Input:-7
Output:-
Prime.

3) Write a C program to calculate power using recursion? function

Ans:-

#include <stdio.h>

```
int power(int a, int b){  
    if(b==0) return 1;
```

```
    return a * power(a, b-1);}
```

```
}
```

```
int main(){
```

```
    int a,b;
```

```
    scanf("%d%d", &a, &b);
```

```
    printf("%d", power(a,b));
```

Input:-

2^3

Output:-

8

4.)

Write a function to check palindrome number using recursion?

Ans:-

#include <stdio.h>

```
int rev(int n, int r){
```

```
    if(n==0) return r;
```

```
    return rev(n/10, r*10+n%10);
```

```
}
```

```
int main(){
```

```
    int n;
```

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

```
    if(n==rev(n,0)) printf("Palindrome");
```

```
    else printf("Not palindrome");
```

```
}
```

Input:-

121

Output:-

palindrome

5) Write a function to calculate nCr .

Ans. ~~#include <stdio.h>~~

```
int fact(int n){  
    if (n==0) return 1;  
    return n*fact(n-1);
```

```
int main(){  
    int n,r;  
    scanf("%d %d", &n, &r);  
    printf("%d, %d", fact(n)/fact(r)*fact(n-r));  
}
```

Input:

5 2

Output:

10

6) Write a program to demonstrate call by value and call by reference.

Ans.

~~#include <stdio.h>~~

```
void value(int x){ x=20; }  
void references(int *x){ x=20; }
```

```
int main(){
```

```
    int a=10;
```

```
    value(a);
```

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

```
    references(&a);
```

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

```
}
```

Output:

10 20

Q) Write a program using function to swap two numbers:

#include <stdio.h>

Void swap (int *a, int *b)

{ int t = *a; *a = *b; *b = t; }

int main()

{ int a, b;

scanf ("%d %d", &a, &b);

swap (&a, &b);

printf ("%d %d", a, b);

Input: 23

Output: 32

Q) Write a recursive function to find the nth Fibonacci number.

#include <stdio.h>

int fib (int n)

{ if (n==0) return 0;

if (n==1) return 1;

return fib(n-1) + fib(n-2);

Input: 6

Output: 8

int main()

{ int n;

scanf ("%d", &n);

printf ("%d", fib(n));

9.) Write a program to find GCD and LCM using functions?

#include <stdio.h>

```
int gcd(int a, int b){  
    if(b==0) return a;  
    return gcd(b, a%b);}  
  
int main(){  
    int a, b;  
    scanf("%d %d", &a, &b);  
    int g = gcd(a, b);  
    printf("GCD = %d LCM = %d", g, (a*b)/g);  
}
```

Input :- 12 18

Output :-
GCD = 6
LCM = 36

10.) Write a program to print the address of variable

#include <stdio.h> Using pointers

```
int g=10;  
int main(){  
    int l=20;  
    printf("%d %d", g, l);  
}
```

Input :-
10, 20

Output :-
Local = 20,
Global = 10.

11) Write a program to demonstrate global and local variables

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

```
int main()
```

```
{ int x=10,  
    int *p=&x;  
    printf("%d", *p);  
}
```

Input

Output (address of a)

12) Write a program to access array elements using pointers.

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

```
int main()
```

```
{ int a[3]={1,2,3};  
    int *p=a;  
    for (int i=0; i<3; i++)  
        printf("old: %d", *(p+i));  
}
```

Input {1,2,3}

Output 1 2 3

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Q) Write a program to print the swap two numbers using pointers.

#include <stdio.h>

int main()

int a=4, b=5;

int *p=&a, *q=&b;

int t=*p; *p=*q; *q=t;

printf("%d %d", a, b);

}

Input:
a=4, b=5

Output:
a=5, b=4;

14)

Q) Write a program to add two numbers using Pointers?

Ans:

#include <stdio.h>

int main()

int a=5, b=6;

int *p=&a, *q=&b;

printf("%d", *p+*q);

Input:
a=5, b=6
Output: 11

15) Write a program to find the length of a string
using pointers?

Ans

#include <stdio.h>

```
int main() {
    char s[] = "Hello";
    char *p=s;
    int count=0;
    while (*p != '\0') { count++; p++;}
    printf("%d", count);
}
```

Input Hello
Output 5

16) Write a program to reverse a string
using pointers?

Ans

#include <stdio.h>

```
#include <string.h>
int main() {
    char s[20];
    scanf("%s", s);
    int n=strlen(s);
    for (int i=n-1; i>=0; i--)
        printf("%c", s[i]);
}
```

Input abcd
Output dcba

Q) Write a program to count vowels using pointers.

Ans

```
#include <stdio.h>
int main() {
    char s[] = "Hello";
    char *p = s;
    int count = 0;
    while (*p) {
        if (*p == 'a' || *p == 'e' || *p == 'i' || *p == 'o' || *p == 'u')
            count++;
        p++;
    }
    printf("%d", count);
}
```

Input: vowels
Output: 2

Q) Write a Program to demonstrate pointer to pointer.

Ans

```
#include <stdio.h>
int main() {
    int a = 10;
    int *p = &a;
    int **q = &p;
    printf("%d", **q);
}
```

Input: 10
Output: 10

Write a program to allocate memory using
malloc() and free it.
~~#include <stdio.h>~~

~~#include <stdlib.h>~~

```
int main()
```

```
    int *p;
```

```
    p=(int*)malloc(sizeof(int));
```

```
*p=50;
```

```
    printf("%d", *p);
```

```
    free(p);
```

Input: *p=50
Output: 50

Write a program to sort an array using
pointer notation.

~~#include <stdio.h>~~

```
int main()
```

```
int a[5]={5,3,1,4,2}
```

```
int *p=a;
```

```
for (int i=0; i<5; i++)
```

```
    for (int j=i+1; j<5; j++)
```

```
        if (* (p+i) > *(p+j)) {
```

```
            int t=* (p+i);
```

```
            * (p+i)=*(p+j);
```

```
            * (p+j)=t;
```

```
}
```

```
for (int i=0; i<5; i++)
```

```
    printf("%d", *(p+i));
```

Input: 5,3,1,4,2

Output: 1,2,3,4,5