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ASSIGNMENT-6

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Subject Name :- C-programming for Reasoning

Subject Code :- CSAR0220

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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(n));  
    }
```

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?

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 palindromic 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("Palindromic");
    else printf("Not palindromic");
}
```

Input:

121

Output:

palindromic

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, 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 reference(int *x) { *x = 20; }
int main() {
    int a = 10;
    value(a);
    printf("%d", a);
    reference(&a);
    printf("%d", a);
}
```

Output:-
10 20

1) Write a C 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 x, y;
    scanf("%d %d", &x, &y);
    swap(&x, &y);
    printf("%d %d", x, y);
}
```

Input 23

output 32

2) 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);
}
```

```
int main()
```

```
{
    int n;
    scanf("%d", &n);
    printf("%d", fib(n));
}
```

Input 6

output 8

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

Ans) #include <stdio.h>

int ged(int a, int b)

{ if (b == 0) return a;
return ged(b, a % b);
}

int main()

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

int g = ged(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 a 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

Ans.

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

Input:-

output:- (address of x)

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

```
#include <stdio.h>
int main()
{
    int a[5] = {1, 2, 3, 4, 5};
    int *p = a;
    for (int i=0; i<5; i++)
        printf("%d", *(p+i));
}
```

Input:- { 1, 2, 3 }

output:- 1 2 3

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;

Write a program to add two numbers using pointers?

14)

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[10];
```

```
    scanf("%s", s);
```

```
    int n = strlen(s);
```

```
    for (int i = n - 1; i >= 0; i--)
```

```
        printf("%c", s[i]);
```

```
}
```

Input: abcd

output: dcba

17) Write a program to count vowels using pointers.

Ans #include <stdio.h>

int main() {

char s[] = "hallo";

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

18) 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>
```

```
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