



Week 4: Programs on pointers, arrays and multiple files

2021

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1	<p>Write a function to display an array elements in the reverse order using multiple files.</p> <p>a) using index b) using pointer</p>
	<p>Program:</p> <p>A) using index</p> <p>P1a_client.c:</p> <pre>#include<stdio.h> #include"P1a_server.h" int main() { int a[100];int n;int i; printf("Enter the size of an array\n"); scanf("%d",&n); read_array(a,n); printf("Array elements: \n"); disp_array(a,n); rev_array(a,0,n-1); printf("Reversed array: \n"); disp_array(a,n); return 0; }</pre> <p>P1a_server.c:</p> <pre>#include<stdio.h> #include"P1a_server.h" void rev_array(int a[],int start,int end) { int temp; while(start<end) { temp=a[start]; a[start]=a[end]; a[end]=temp; ++start; --end; }}</pre>

```
void read_array(int a[],int n)
{
int i;
printf("Enter elements\n");
for(i=0;i<n;++i)
scanf("%d",&a[i]);
}
void disp_array(int a[],int n)
{
int i;
for(i=0;i<n;++i)
printf("%d\t",a[i]);
printf("\n");
}
```

P1a_server.h:

```
void rev_array(int[],int ,int);
void read_array(int[],int);
void disp_array(int[],int);
```

B) using pointer**P1b_client.c:**

```
#include<stdio.h>
#include"P1b_server.h"
int main()
{
int a[100];int n;int i;
printf("Enter the size of an array\n");
scanf("%d",&n);
read_array(a,n);
printf("Array elements: \n");
disp_array(a,n);
rev_array(a,0,n-1);
printf("Reversed array: \n");
disp_array(a,n);
return 0;
}
```

P1b_server.c:

```
#include<stdio.h>
#include"P1b_server.h"
void rev_array(int a[],int start,int end)
{
    int temp;
    while(start<end)
    {
        temp=*(a+start);
        *(a+start)=*(a+end);
        *(a+end)=temp;
        ++start;
        --end;
    }
}
void read_array(int a[],int n)
{
    int i;
    printf("Enter elements\n");
    for(i=0;i<n;++i)
        scanf("%d",&a[i]);
}
void disp_array(int a[],int n)
{
    int i;
    for(i=0;i<n;++i)
        printf("%d\t",a[i]);
    printf("\n");
}
```

P1b_server.h:

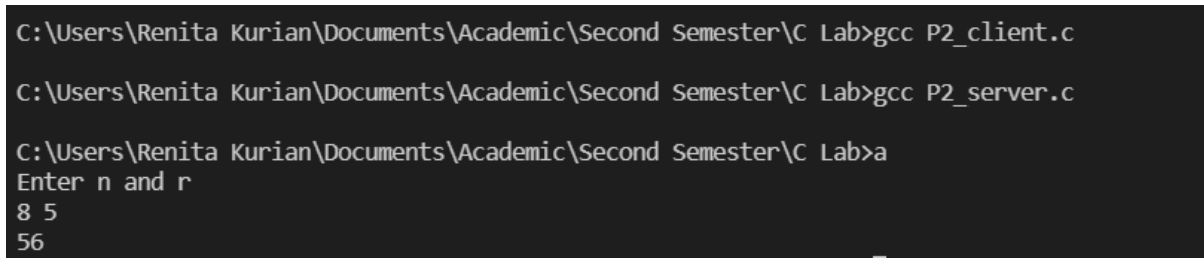
```
void rev_array(int[],int ,int);
void read_array(int[],int);
void disp_array(int[],int);
```

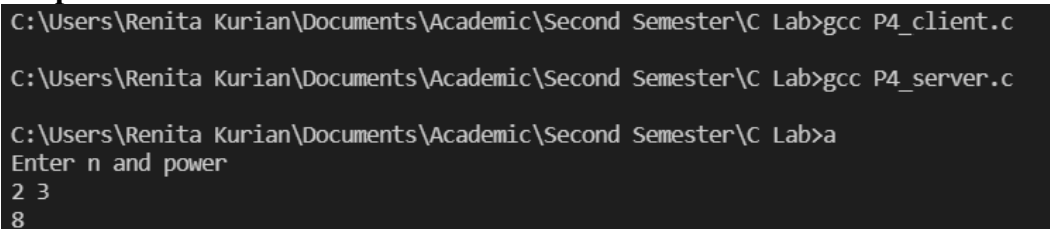
Output Screenshot:**a)**

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P1a_client.c
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P1a_server.c
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>a
Enter size
3
Enter elements
2 4 6
Reversed elements
6 4 2
```

b)

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P1b_client.c
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P1b_server.c
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>a
Enter size
5
Enter elements
1 2 3 4 5
Reversed elements
5 4 3 2 1
```

2	<p>Write a function for factorial using recursion and use it to find C(n,r) using multiple files</p>
	<p>Program:</p> <p>P2_client.c:</p> <pre>#include<stdio.h> #include"P2_server.h" int main() { int n; int r; int ncr; printf("Enter the value of n and r\n"); scanf("%d %d",&n,&r); ncr=fact(n)/(fact(r)*fact(n-r)); printf("ncr is: %d",ncr); return 0; }</pre> <p>P2_server.c:</p> <pre>#include"P2_server.h" int fact(int n) { return(n==0)?1:n*fact(n-1); }</pre> <p>P2_server.h:</p> <pre>int fact(int);</pre>
	<p>Output Screenshot:</p>  <pre>C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P2_client.c C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P2_server.c C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>a Enter n and r 8 5 56</pre>

4	Write a program in C to calculate the power of any number using recursion and multiple files
	<p>Program:</p> <p>P4_client.c:</p> <pre>#include<stdio.h> #include"P4_server.h" int main() { int bNum;int pwr; long int result; printf("Input the base value: "); scanf("%d",&bNum); printf("Input the value of power : "); scanf("%d",&pwr); result=Power(bNum,pwr); printf("The value of %d to the power of % is: %d\n\n",bNum,pwr,result); return 0; }</pre> <p>P4_server.c:</p> <pre>#include<stdio.h> #include"power.h" long int Power(int x,int y) { long int result=1; if(y==0) return result; else result=x*(Power(x,y-1)); }</pre> <p>P4_server.h:</p> <pre>long int Power(int x,int y);</pre>
	<p>Output Screenshot:</p> 

5	Write a function to check whether a given number is prime and use that to find the next prime number, greater than a given number
	<p>Program:</p> <p>P5_client.c:</p> <pre>#include<stdio.h> #include"P5_server.h" int main() { int n; printf("Enter a number\n"); scanf("%d",&n); printf("Next prime number=%d\n",nextprime(n)); return 0; }</pre> <p>P5_server.c:</p> <pre>#include"server.h" int isprime(int n) { int i,count=0; for(i=1;i<=n;++i) { if(n%i==0) count++; } if(count==2) return 1; else if(count>2) return 0; } int nextprime(int n) { int i=n+1; while(1) { if(isprime(i)) break; i++; } return i; }</pre>

P5_server.h:

```
int isprime(int n);  
int nextprime(int n);
```

Output Screenshot:

```
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P5_client.c  
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>gcc P5_server.c  
C:\Users\Renita Kurian\Documents\Academic\Second Semester\C Lab>a  
Enter a number  
20  
Next prime number: 23
```