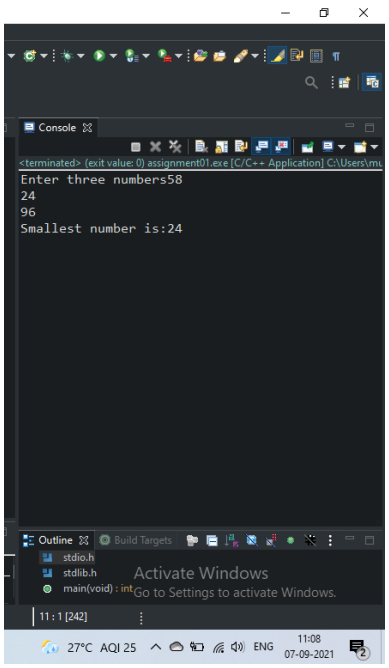
Assignments

1. Write a program to find smallest of three numbers using ternary operator

Code of the program & screenshot of the output.

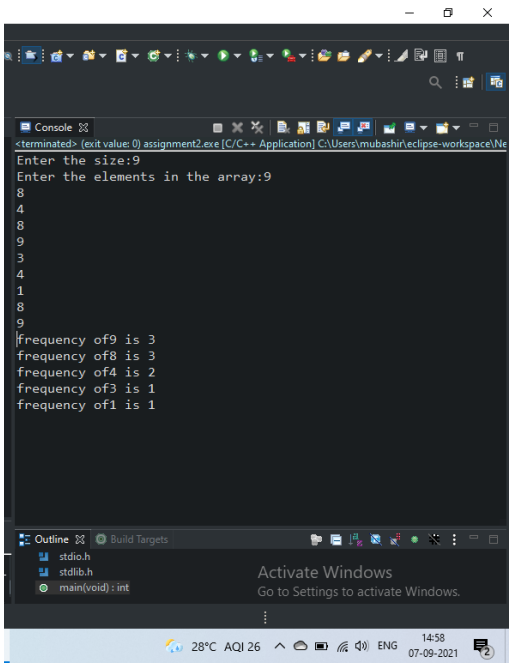
```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    int a,b,c,d,r;
    setbuf(stdout,NULL);
    printf("Enter three numbers");
    scanf("%d%d%d",&a,&b,&c);
    d=(b<a)?b:a;
    r=(c<d)?c:d;
    printf("Smallest number is:%d",r);

    return EXIT_SUCCESS;
}
```



2. Write a program to find the frequency of each element in the array

Code of the program & screenshot of the output.

```
int main(void) {
    int i,j,a[50],b[50],n,count;
    setbuf(stdout,NULL);
    printf("Enter the size:");
    scanf("%d",&n);
    printf("Enter the elements in the array:");
    for(i=0;i<=n;i++){
            scanf("%d",&a[i]);
    }
    for(i=0;i<=n;i++){
            count=1;
            if(a[i]!=0){
    for(j=i+1;j<=n;j++){
                    if(a[i]==a[j]){
                            count++;
                            a[j]=0;
                    }
}
                    b[i]=count;

    }
    }
    for(i=0;i<=n;i++){
            if(a[i]!=0){
                    printf("frequency of%d is %d\n",a[i],b[i]);
            }
    }

    return EXIT_SUCCESS;
}
```

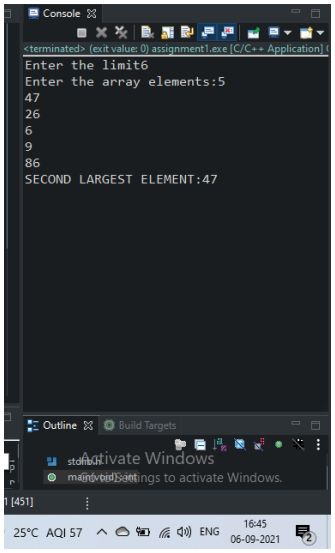


3. Write a program to find Second Largest Number in an Array

Code of the program & screenshot of the output.

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

int main(void) {
    int i,j,n,arr[50],temp[30];
    setbuf(stdout,NULL);
    printf("Enter the limit");
    scanf("%d",&n);
    printf("Enter the array elements:");
    for(i=0;i<=n-1;i++){
            scanf("%d",&arr[i]);
    }
    for(i=0;i<=n-1;i++){
            for(j=i+1;j<=n-1;j++){
                    if(arr[i]<=arr[j]){
                            temp[i]=arr[i];
```

```
                    arr[i]=arr[j];
                    arr[j]=temp[i];
                }
            }}
    printf("SECOND LARGEST ELEMENT:%d",arr[1]);



    return EXIT_SUCCESS;
}
```



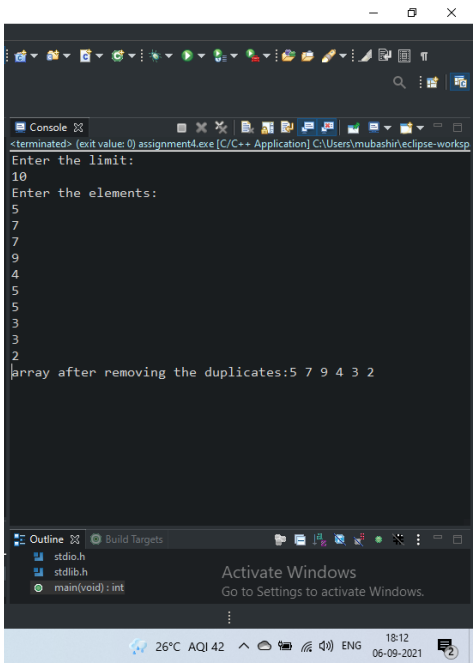
4. Program to Remove Duplicate Element in an array

Code of the program & screenshot of the output.:-

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

int main(void) {
    int i,j,k,limit,arr[50];
```

```
    setbuf(stdout,NULL);
    printf("Enter the limit:\n");
    scanf("%d",&limit);
    printf("Enter the elements:\n");
    for(i=0;i<=limit-1;i++){
            scanf("%d",&arr[i]);
    }
    for(i=0;i<=limit-1;i++){
            for(j=i+1;j<=limit;j++){
                    if(arr[i]==arr[j]){
                            for(k=j;k<=limit-1;k++){
                                    arr[k]=arr[k+1];}
                                    limit--;
                                    j--;}}}




    printf("array after removing the duplicates:");
    for(i=0;i<=limit-1;i++){
            printf("%d ",arr[i]);}

    return EXIT_SUCCESS;
}
```

Output:-



5. Write a program to find all subsets of a string.

Code of the program & screenshot of the output.

6. Write a program to find maximum and minimum occurring character in a string

Code of the program & screenshot of the output.

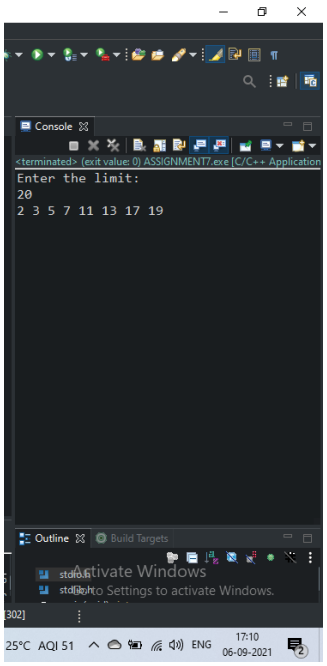
7. Write a program to print the prime numbers upto a limit.

Code of the program & screenshot of the output:-

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

int main(void) {
    int i,j,n,count;
    setbuf(stdout,NULL);
    printf("Enter the limit:\n");
    scanf("%d",&n);
    for(i=2;i<=n;i++){
            count=0;
```

```
            for(j=1;j<=n;j++){
                    if(i%j==0){
                            count++;
                    }
            }
            if(count==2){
                    printf("%d ",i);

                    }}


    return EXIT_SUCCESS;
}
```

Output:-

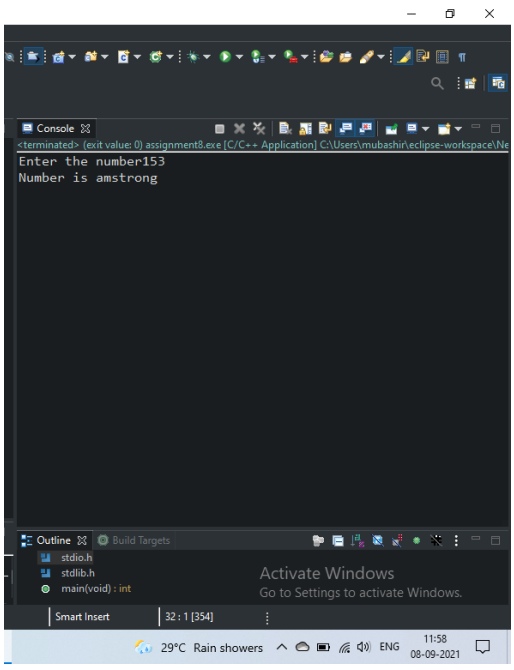


8. Create a program to check whether the given number is an Armstrong Number

Code of the program & screenshot of the output.

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

```
int main(void) {
	int num,temp,sum=0,rem;
	setbuf(stdout,NULL);
	printf("Enter the number");
	scanf("%d",&num);
	temp=num;
	while(temp!=0){
		rem=temp%10;
		sum=sum+rem*rem*rem;
		temp=temp/10;
	}
	if(num==sum){
		printf("Number is amstrong");}
	else{
		printf("number is not amstrong");}

	return EXIT_SUCCESS;
}
```

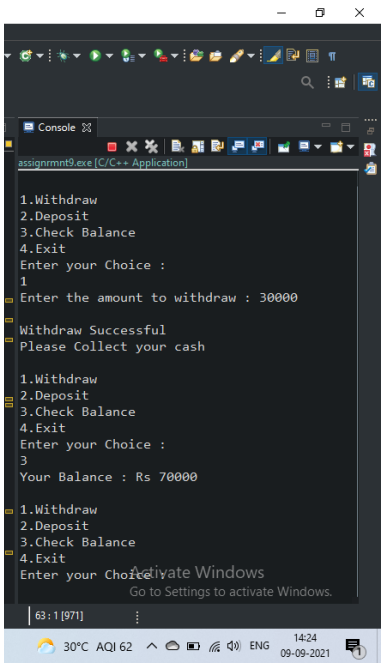


9. Create the functionality of ATM
    a. To withdraw the money, we simply get the withdrawal amount from the user and remove that amount from the total balance and print the successful message.
    b. To deposit the money, we simply get the deposit amount from the user, add it to the total balance and print the successful message.
    c. To check balance, we simply print the total balance of the user.
    d. Exit

Code of the program & screenshot of the output.

```
#include <stdio.h>
#include <stdlib.h>
int total=100000,w_amount,d_amount;
int main(void) {
setbuf(stdout,NULL);
int choice;
do{
printf("\n\n1.Withdraw\n2.Deposit\n3.Check Balance\n4.Exit\n"
"Enter your Choice :\n");
scanf("%d",&choice);
 switch(choice){
 case 1:
 withdraw();
 break;
 case 2:
 deposit();
 break;
 case 3:
 checkBalance();
 break;
 case 4:
 exit(0);
 break;
 }
 }
```

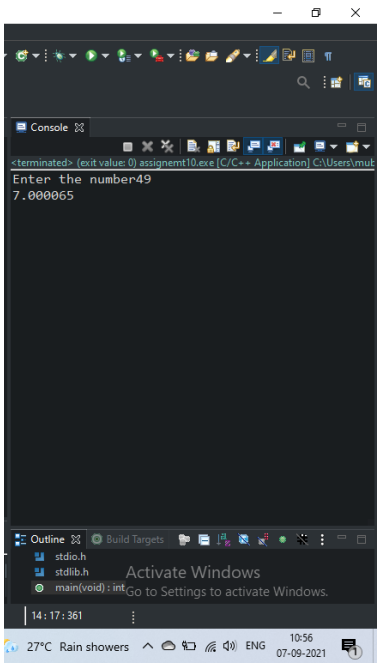
```
 while (1);
 }
  void withdraw(){
  int flag=0;
  printf("Enter the amount to withdraw : ");
  scanf("%d",&w_amount);
  if(w_amount%500!=0){
 printf("Please enter the in multiples of 500\n");
  }else if (w_amount>(total-1000))
  {
  printf("\nInsufficent Balance!!!\n");
  }
  else
  {
  total=total-w_amount;
printf("\nWithdraw Successful ");
printf("\nPlease Collect your cash");
}
}
    void deposit(){
    printf("Enter Amount : ");
   scanf("%d",&d_amount);
  total=total+d_amount;
  printf("\nDeposited Successfully");
  }
void checkBalance(){
printf("Your Balance : Rs %d",total);
}
```



10. Write a program to Find Square Root of a Number

Code of the program & screenshot of the output.

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

int main(void) {
    float i,n;
    setbuf(stdout,NULL);
    printf("Enter the number");
    scanf("%f",&n);
    for(i=0.01;i*i<n;i=i+0.01);


    printf("%f",i);
    return EXIT_SUCCESS;
}
```



11. Write a program with different functions for the following operations in array
    a. Find Smallest element
    b. Find Largest element

c. Sum of all elements
d. Number of elements

Code of the program & screenshot of the output.

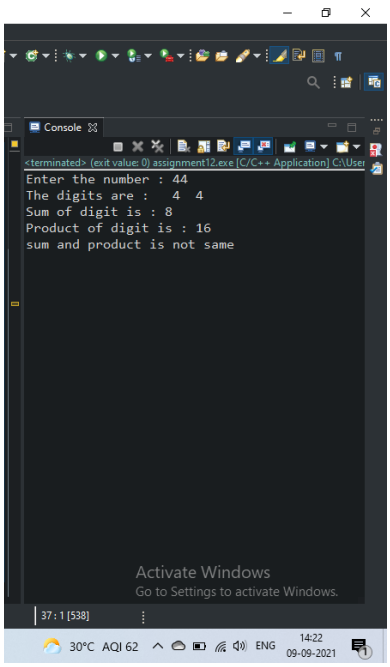
12. Write a program to check weather the sum of digits and product of digits of a number is same

Code of the program & screenshot of the output.

```
#include <stdio.h>
#include <stdlib.h>
int main(void) {
int digit,num,i,sum=0,product=1;
int array[10];
setbuf(stdout,NULL);
printf("Enter the number : ");
scanf("%d",&num);
printf("The digits are : ");
while(num!=0){
digit=num%10;
num=num/10;
i=0;
printf("%3d",digit);
array[i]=digit;
sum=sum+digit;
product=product*digit;
i++;
}
printf("\nSum of digit is : %d",sum);
printf("\nProduct of digit is : %d",product);
if(sum==product)
printf("\nsum and product is same");
else
printf("\nsum and product is not same");
```

return EXIT_SUCCESS;

}



13. Write a program that consists a class named ‘student’, it should have following characteristics

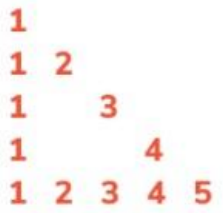
a. Name
b. School (same for all students - thus create as static)
c. Grade
d. Mark
e. A function to check if student is passed or not

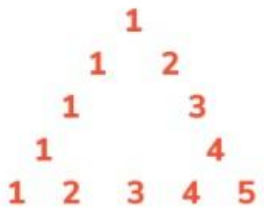
The program should ask for

a. Add student
b. Search student - it should show details including pass status
c. Display all students
d. Exit

Code of the program & screenshot of the output.

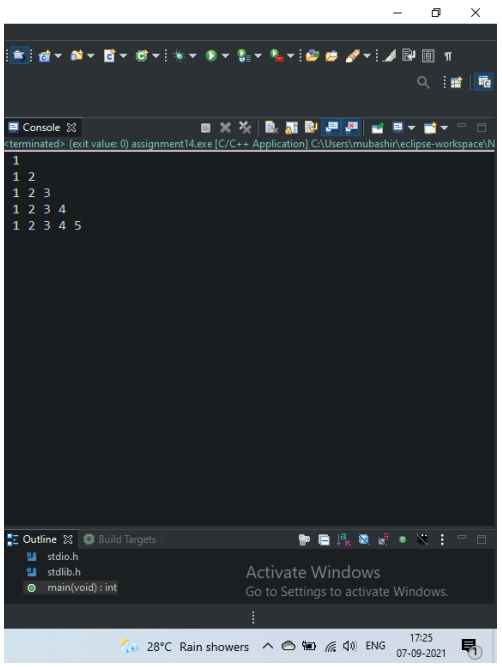
14. Create the following patterns:



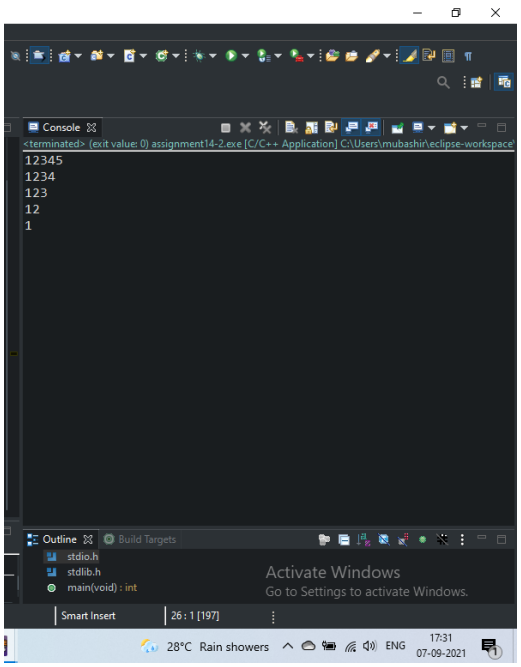


Code of the program & screenshot of the output.

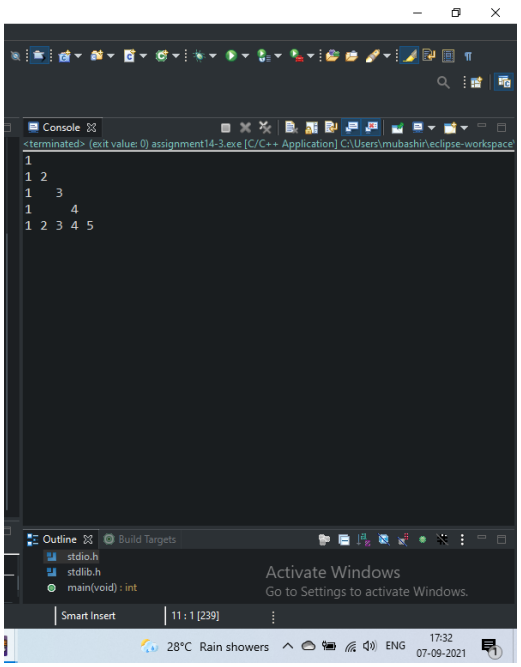
```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    int i,j;
    for(i=1;i<=5;i++){
            for(j=1;j<=i;j++){
                    printf(" %d",j);
            }
            printf("\n");
    }
    return EXIT_SUCCESS;
}
```




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

int main(void) {
	int i,j;
	setbuf(stdout,NULL);
	for(i=5;i>=1;i--){
		for(j=1;j<=i;j++){
			printf("%d",j);

		}
		printf("\n");
	}
	return EXIT_SUCCESS;
}
```

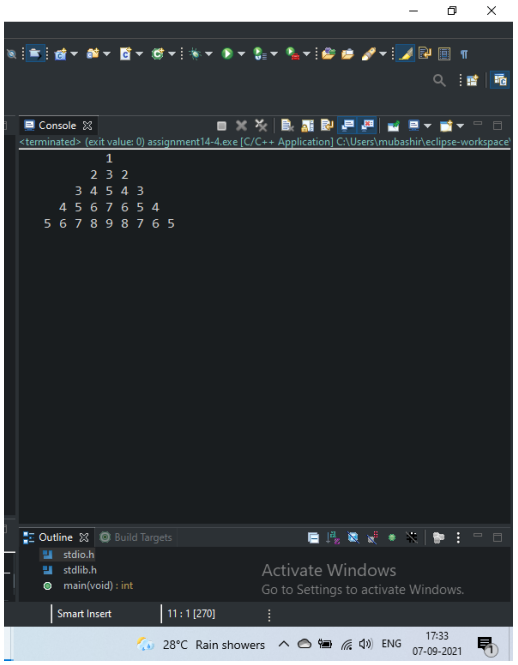



```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
	int i,j;
	for(i=1;i<=5;i++){
		for(j=1;j<=i;j++){
			if(j==1||i==j||i==5){
				printf("%d ",j);
			}
			else{
				printf("  ");
			}
		}
		printf("\n");


	}
	return EXIT_SUCCESS;
}
```



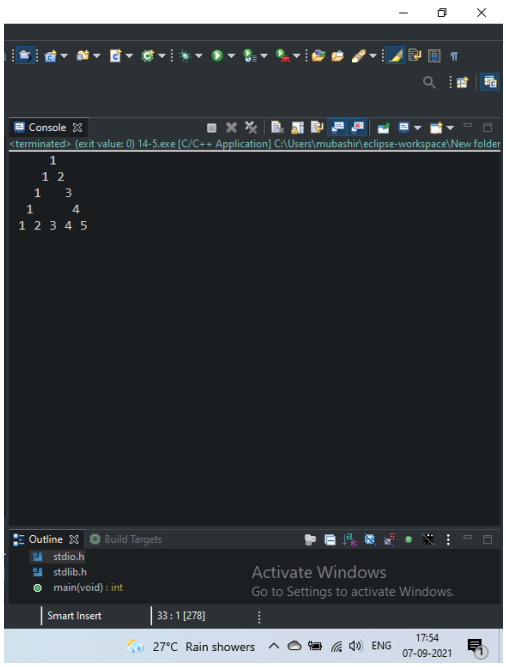

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    int i,j,k;
for(i=1;i<=5;i++){
    for(j=i;j<=5;j++){
            printf("  ");

    }
    k=i;
    for(j=1;j<=i;j++){
            printf(" %d",k++);
    }
    k=k-2;
    for(j=1;j<i;j++){
            printf(" %d",k--);

    }
    printf("\n");
```

```
}
    return EXIT_SUCCESS;
}
```



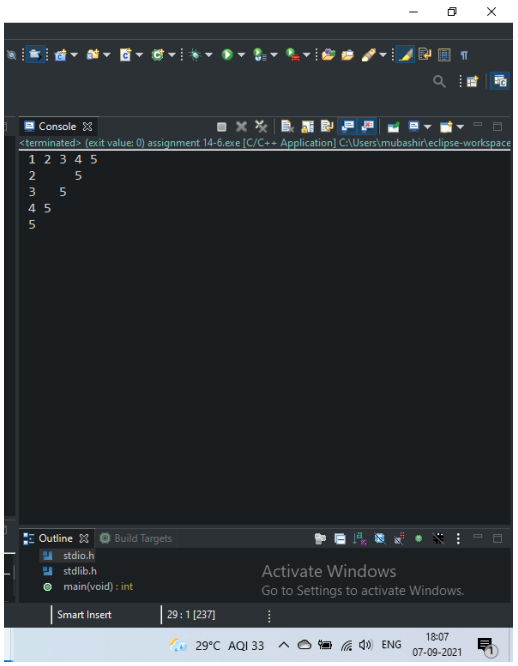

```
#include <stdio.h>
#include <stdlib.h>

int main(void) {
    int i,j,k;
    for(i=1;i<=5;i++){
            for(j=i;j<5;j++){
                    printf(" ");
            }
            for(k=1;k<=i;k++){
                    if(k==1||i==5||i==k){
                            printf(" %d",k);}
                            else{
                                    printf("  ");}

                    }
```

```
            printf("\n");
        }
        return EXIT_SUCCESS;
}
```

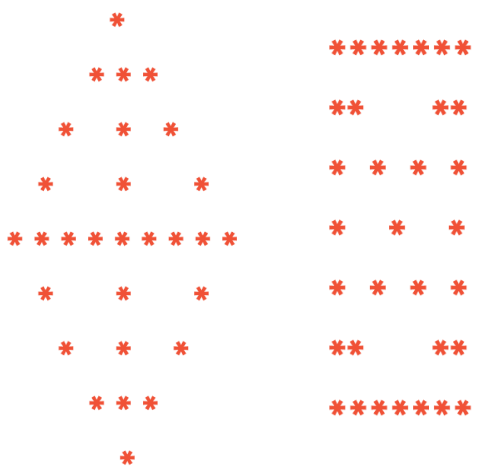



```
#include <stdio.h>
#include <stdlib.h>

int main(void){
    int i,j;
    for(i=1;i<=5;i++){
            for(j=i;j<=5;j++){
                    if(j==5||i==1||j==i){
                            printf(" %d",j);
                    }
                    else{
                            printf("  ");
                    }
            }
```

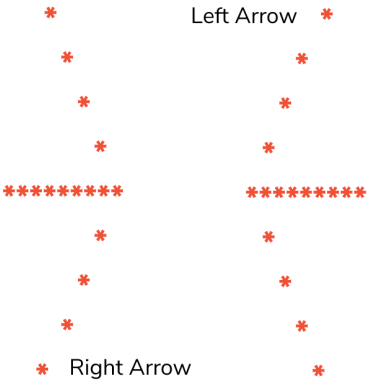
```
            printf("\n");
        }
        return EXIT_SUCCESS;
}
```



15. Create the following patterns:



```
3          1          1          *
44         2*2        2*3        * 1 *
555        3*3*3      4*5*6      * 1  2  1 *
6666       4*4*4*4    7*8*9*10   * 1  2  3  2  1 *
555        4*4*4*4    7*8*9*10   * 1  2  1  *
44         3*3*3      4*5*6      * 1 *
3          2*2        2*3        *
           1          1
```



Code of the program & screenshot of the output.

```
#include <stdio.h>
   int main(){
      int i,j,k;
      int temp=3,n=4;
      for(i=1;i<=n;i++){
         for(j=1;j<=i;j++){
            printf("%d ",temp);
         }
         temp++;
         printf("\n");
      }
       temp=temp-2;
```

```
for(i=4;i>=1;i--){

    for(j=1; j<=i-1;j++){
        printf("%d ",temp);
    }
    temp--;

    printf("\n");
}
printf("\n");

for(i=1;i<=n;i++){
    for(j=1;j<=2*i-1;j++){
        if(j%2==0){
            printf("* ");
        }else{
            printf("%d ",i);
        }


    }
    printf("\n");
}
for(i=n;i>=1;i--){
    for(j=1;j<=2*i-1;j++){
        if(j%2==0){
            printf("* ");
        }else{
            printf("%d ",i);
        }
    }
    printf("\n");
}
```

```
printf("\n");
n=9;
for(i=0;i<n;i++){
   for(j=0;j<n;j++){
      if(i==n/2||j==n/2||i+j==n/2||i-j==n/2||j-i==n/2 || j+i==(n/2)*3){
         printf("* ");
      }else{
         printf("  ");
      }

   }
   printf("\n");
}
 printf("\n");
for(i=1;i<=n;i++){
   for(j=1;j<=n;j++){
      if(i==1||j==1||j==n||i==n|| i==j|| i==n+1-j){
          printf("* ");
      }else{
         printf("  ");
      }

   }
   printf("\n");
}
for(i=0;i<n;i++){
   for(j=0;j<n;j++){
      if(i==n/2||j-i==n/2 || j+i==(n/2)*3){
         printf("* ");
      }else{
         printf("  ");
      }
```

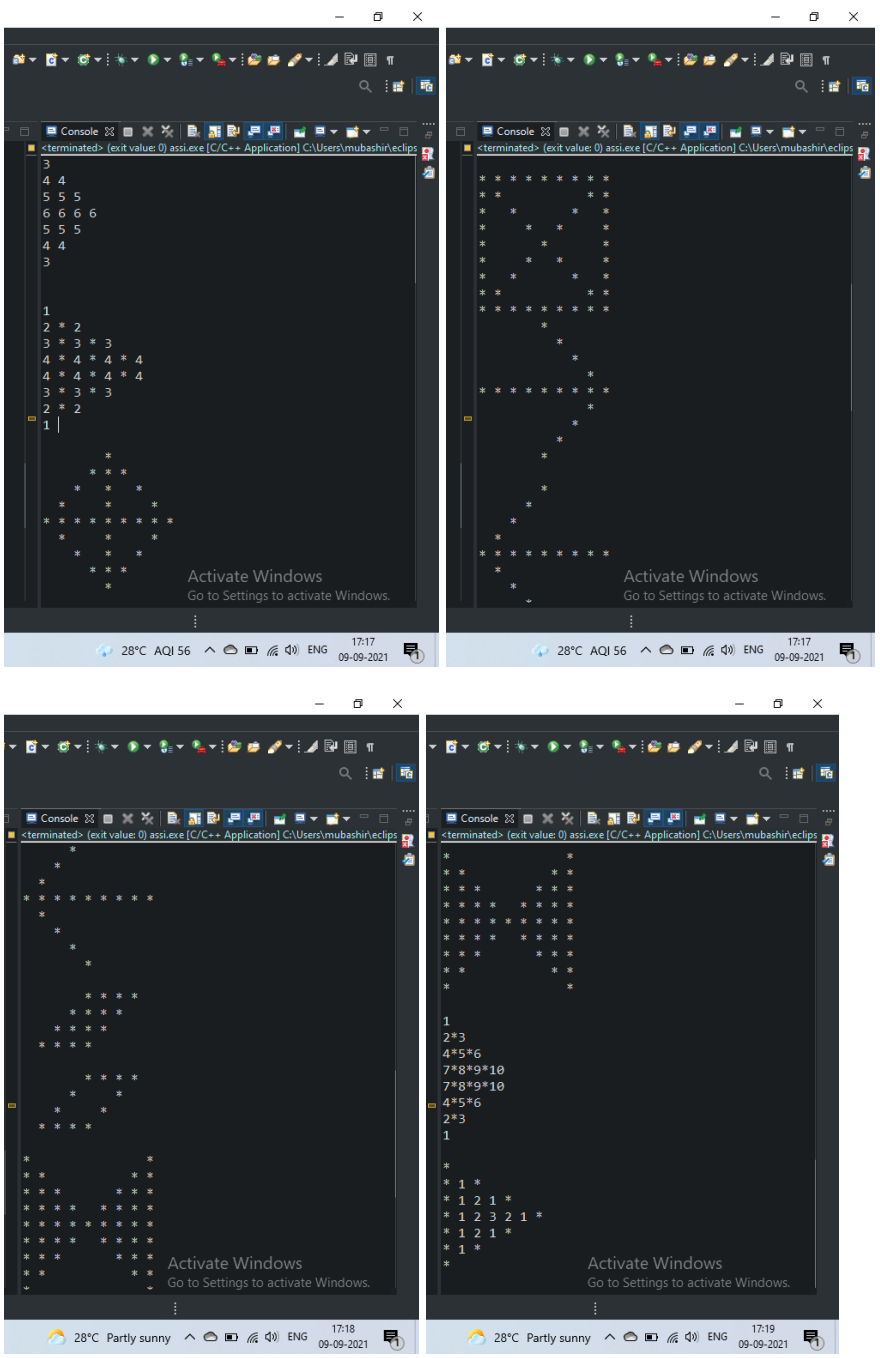
```
    }
    printf("\n");
  }
  printf("\n");
  for(i=0;i<n;i++){
    for(j=0;j<n;j++){
      if(i==n/2||i+j==n/2 ||i-j==n/2 ){
        printf("* ");
      }else{
        printf("  ");
      }

    }
    printf("\n");
  }
  printf("\n");
  for(i=1;i<=4;i++){
    for(k=4;k>=i;k--){
      printf("  ");
    }
    for(j=1;j<=4;j++){
      printf("* ");
    }
    printf("\n");
  }
   printf("\n");
  for(i=1;i<=4;i++){
    for(k=4;k>=i;k--){
      printf("  ");
    }
    for(j=1;j<=4;j++){
      if(i==1||i==4||j==1||j==4){
```

```
            printf("* ");
        }else{
            printf("  ");
        }

    }
    printf("\n");
}
printf("\n");
for(i=1;i<=n;i++){
    for(j=1;j<=n;j++){
        if(j==1||j==n|| i>=j && i<=n+1-j || i<=j && i>=n+1-j){
            printf("* ");
        }else{
            printf("  ");
        }

    }
    printf("\n");
}
printf("\n");
temp =1;
for(i=1;i<=4;i++){
    for(j=1;j<=2*i-1;j++){
        if(j%2==0){
            printf("*");
        }else{
            printf("%d",temp++);
        }

    }
    printf("\n");
}
```

```
int tem;
for(i=4;i>=1;i--){
    temp=temp-i;
    tem=temp;
    for(j=1;j<=i*2-1;j++){
        if(j%2==0){
            printf("*");
        }else{
             printf("%d",tem++);
        }


    }
    printf("\n");
}
printf("\n");
for(i=0;i<=3;i++){
    for(j=0;j<=i;j++){
        if(j==0){
            printf("* ");
        }else{
            printf("%d ",j);
        }

    }
    for(k=i-1;k>=0;k--){
        if(k==0){
            printf("* ");
        }else{
            printf("%d ",k);
        }
    }
    printf("\n");
```

```
        }
        for(i=2;i>=0;i--){
           for(j=0;j<=i;j++){
              if(j==0){
                 printf("* ");
              }else{
                 printf("%d ",j);
              }
           }
           for(k=i-1;k>=0;k--){
              if(k==0){
                 printf("* ");
              }else{
                 printf("%d ",k);
              }
           }
           printf("\n");
        }
     }
```

Output:-



16. Given a string, S of size N, and a number of rows R, the task is to print the given string in a vertical zigzag fashion with respect to the given number of rows as shown in the examples.

a. Input:
S="123456789ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz", R = 9

Output:

```
1       H       X       n
2      GI      WY      mo
3     F J     V Z     l p
4    E K     U a     k q
5   D  L   T  b   j  r   z
6  C   M  S   c  i   s  y
7 B    N R    d h    t x
8A     OQ     eg     uw
9      P      f      v
```

b. Input: S = “AttentionReaders!Don’tStopLearning!HappyLearning!”, R = 12

Output:

```
A          S          n
t         tt         ri
t        ' o        a n
e       n  p       e  g
n      o   L      L   !
t     D    e     y
i    !     a    p
o   s      r   p
n  r       n  a
R e        i H
ed         n!
a          g
```

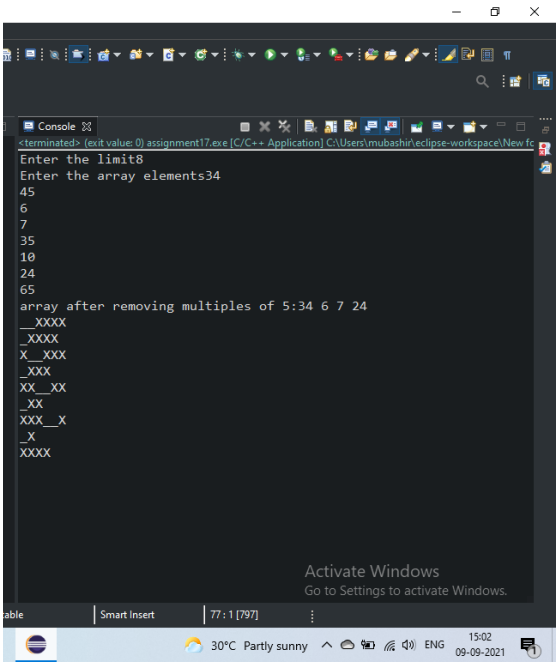
Code of the program & screenshot of the output.

17. Write a program to delete all the multiples of 5 in an array. Print the array elements in the following pattern.

```
_ _ X X X X
_ X X X X
X
_ _ X X X
_ X X X
X
X
_ _ X X
_ X X
X
X
X
_ _ X
_ X
X
X
X
X
```

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

int main(void) {
	int i,j,n,arr[30],k,z,x,p=6,a=5,c=1;
	setbuf(stdout,NULL);
	printf("Enter the limit");
	scanf("%d",&n);
	printf("Enter the array elements");
	for(i=0;i<n;i++){
		scanf("%d",&arr[i]);
	}
	for(j=0;j<n;j++){

			if(arr[j]%5==0){
				for(k=j;k<=n;k++){
				arr[k]=arr[k+1];}
				n--;
				j--;
			}
			}
printf("array after removing multiples of 5:");
for(j=0;j<n;j++){
	printf("%d ",arr[j]);}


printf("\n");


	for(z=1;z<=4;z++){
		for(x=1;x<=p;x++){
			if(x>2){
			printf("X");
			}


			else{
				printf("_");
			}}


		printf("\n");
		p--;
		for(x=1;x<=a;x++){
		if(x>1){
		printf("X");


		}
```

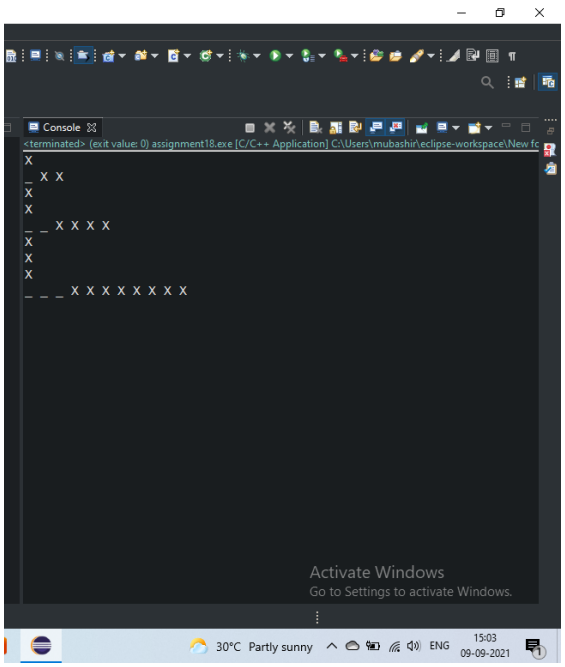
```
                else{
                printf("_");
                }

                }
                printf("\n");
                                        a--;

for(x=1;x<=c;x++){
        printf("X");
}
c=c+1;
        }

        return EXIT_SUCCESS;
}
```



18. Write a C program to draw the following pattern

```
X
_ X X
X
X
_ _ X X X X
X
X
X
_ _ _ X X X X X X X X
```

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

int main(void) {
    int i,j,k,b,n=1,l=1,c=2;
    for(i=1;i<=3;i++){
            for(j=1;j<=n;j++){
                    printf("X\n");
            }
            n=n+1;
            for(k=1;k<=l;k++){
                    printf("_ ");
            }
            l=l+1;
            for(b=1;b<=c;b++){
                    printf("X ");
            }
            c=c*2;
            printf("\n");
    }
    return EXIT_SUCCESS;
}
```



19. Merge two arrays & remove duplicate elements from the array. Print the array elements in the following pattern.

* * *

*

*

*

* * * * * *

*

*

*

*

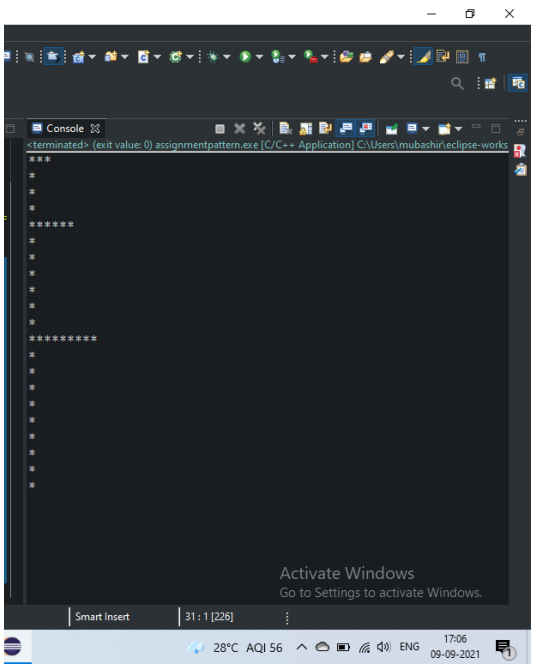
*

*

* * * * * * * * *

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

int main(void) {
```

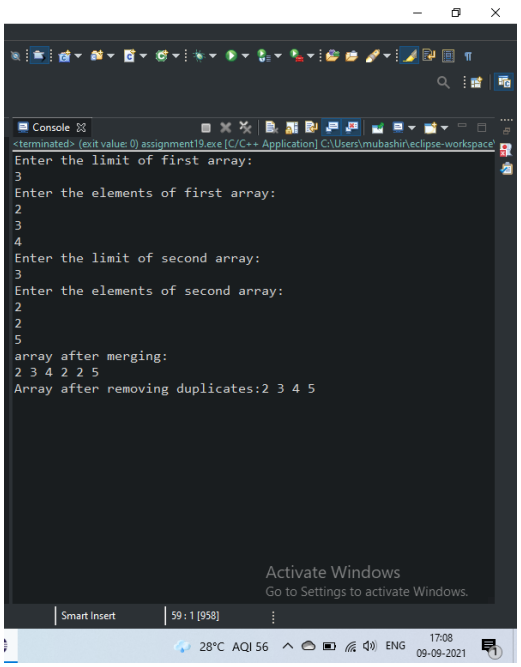
```
    int i,j,a=3;
    for(i=1;i<=3;i++){
            for(j=1;j<=a;j++){
                    printf("*");

            }
            printf("\n");

    for(j=1;j<=a;j++){
            printf("*\n");
    }

    a=a+3;
    }
    return EXIT_SUCCESS;
}
```




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

```
int main(void) {
    int i,j,limit,arr[40],brr[40],limit2,limit3,a=0,k,m,z;
    setbuf(stdout,NULL);
    printf("Enter the limit of first array:\n");
    scanf("%d",&limit);
    printf("Enter the elements of first array:\n");
    for(i=0;i<limit;i++){
            scanf("%d",&arr[i]);
    }
    printf("Enter the limit of second array:\n");
    scanf("%d",&limit2);
    printf("Enter the elements of second array:\n");
    for(i=0;i<limit2;i++){
            scanf("%d",&brr[i]);
    }
    for(j=0;j<=limit;j++){
            arr[limit+a]=brr[j];
            a++;

    }
    limit3=limit+limit2;
    printf("array after merging:\n");
    for(j=0;j<limit3;j++){
            printf("%d ",arr[j]);
    }
printf("\n");
    printf("Array after removing duplicates:");
        for(k=0;k<limit3;k++){
            for(j=k+1;j
            <limit3;j++){
                if(arr[k]==arr[j]){
                        for(z=j;z<limit3;z++){
```

```
                    arr[z]=arr[z+1];
                }
                limit3--;
                j--;
            }
        }}

    for(m=0;m<limit3;m++){
    printf("%d ",arr[m]);
    }

    return EXIT_SUCCESS;
}
```



20. Given a string. Find the length of the string. If the string length is odd print the following pattern

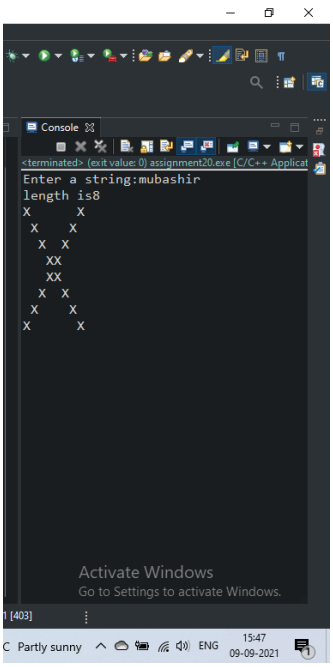
```
X   X
 X X
  X
```

```
 X  X
X    X
```

If the string length is even, print the following pattern

```
X        X
 X     X
   X  X
   X  X
 X     X
X        X
```

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

int main(void) {
int i,j,length;
char name[30];
setbuf(stdout,NULL);
printf("Enter a string:");
gets(name);
length=strlen(name);
printf("length is%d",length);
printf("\n");
for(i=1;i<=length;i++){
        for(j=1;j<=length;j++){
                if(i==j||j==length-i+1){
                        printf("X");
                }
                else{
                        printf(" ");
                }
        }
        printf("\n");
}


        return EXIT_SUCCESS;
}
```

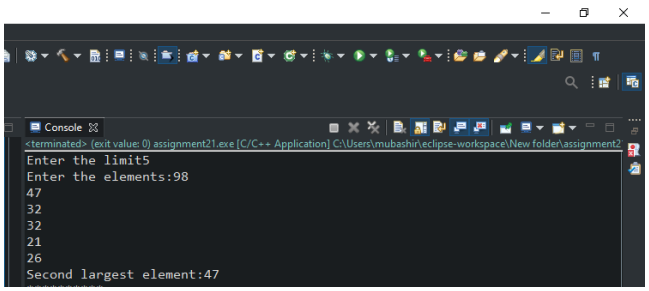


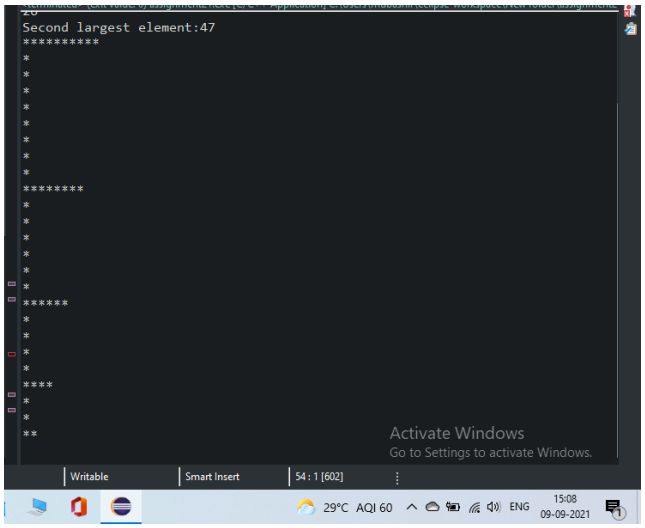
*21. Write a C program to find the second largest element of an array(Let it be 'n') and print 'n' number of * in the following pattern.*

```
* * * * * * * * * *
*
* * * * * * * *
*
*
* * * * * *
*
*
*
* * * *
*
*
*
*
* *
*
*
```

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

int main(void) {
    int arr[30],i,j,n,k,temp,m,u,a=10,b=1,s,count;
    setbuf(stdout,NULL);
    printf("Enter the limit");
    scanf("%d",&n);
    printf("Enter the elements:");
    for(i=0;i<=n;i++){
            scanf("%d",&arr[i]);
    }
    for(j=0;j<=n;j++){
            for(k=j+1;k<=n;k++){
                    if(arr[j]<arr[k]){
                            temp=arr[k];
                            arr[k]=arr[j];
                            arr[j]=temp;
                    }

            }
    }
    printf("Second largest element:%d",arr[1]);
printf("\n");

for(m=1;m<=5;m++){

    for(u=1;u<=a;u++){
            printf("*");
```

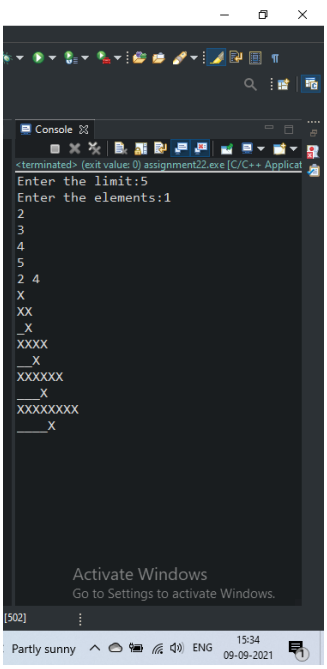
```
        }
        printf("\n");
        a=a-2;
        for(s=1;s<=a;s++){
                printf("*\n");

        }
        b=b+1;

}

        return EXIT_SUCCESS;
}
```





22. *Write a program in C to find even numbers in an array. Print the even integers in following pattern*

```
X
X X
 _ X
X X X X
_ _ X
X X X X X X
_ _ _ X
X X X X X X X X
_ _ _ _ X
#include <stdio.h>
#include <stdlib.h>

int main(void) {
int i,j,limit,arr[30],a=2,b=1;
setbuf(stdout,NULL);
printf("Enter the limit:");
scanf("%d",&limit);
printf("Enter the elements:");
for(i=0;i<limit;i++){
        scanf("%d",&arr[i]);
}
for(j=0;j<limit;j++){
        if(arr[j]%2==0){
                printf("%d ",arr[j]);
        }
}
printf("\n");

printf("X\n");
for(i=1;i<=4;i++){
for(j=1;j<=a;j++){
        printf("X");
}
a=a+2;
printf("\n");
for(j=1;j<=b;j++){
        printf("_");

}
b=b+1;
printf("X");
printf("\n");}
return EXIT_SUCCESS;
}
```


Console
<terminated> (exit value: 0) assignment22.exe [C/C++ Applicat
Enter the limit:5
Enter the elements:1
2
3
4
5
2 4
X
XX
_X
XXXX
__X
XXXXXX
___X
XXXXXXXX
____X
Activate Windows
Go to Settings to activate Windows.
[502]
Partly sunny
ENG
15:34
09-09-2021