

ASSIGNMENT 8

```
// assignment 8 program 1
```

```
/*
```

"Declare a template class called exam having an array of generic type as a data member, named elements[10].

Define following generic (template) member functions:

- sort to arrange elements in ascending order
- find_max to find and return maximum from the array

Define main to illustrate usage of these functions to process two different types of data."

```
*/
```

```
#include<iostream>
```

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

```
using namespace std;
```

```
template <class T>
```

```
class exam{
```

```
    public:
```

```
        T elements[1000];
```

```
        int size;
```

```
        void get(int size){
```

```
            for(int i=0;i<size;i++){
```

```
                cout << "\n Enter an element in the array : ";
```

```
                cin >> elements[i];
```

```
            }
```

```
        }
```

```
        T findmax(int size){
```

```
            T max=0;
```

```
            for(int i=0;i<size;i++){
```

```

        if(max<elements[i])
        {
            max=elements[i];
        }
    }
    return max;
}

void sort(int size){

    for(int i=0;i<size;i++)
    {

        for(int j=i+1;j<size;j++){

            if(elements[i]>elements[j])
            {
                T temp=elements[i];
                elements[i]=elements[j];
                elements[j]=temp;

            }

        }

    }

}

void display(int size){
    for(int i=0;i<size;i++){

```

```

        cout << elements[i] << endl;

    }

}

};

int main(){

    int n;

    cout << "\n Enter no of elements in the array : ";

    cin >> n;

    exam<int> i;

    i.get(n);

    int max;

    cout << "\n Integer maximum number is : ";

    max=i.findmax(n);

    cout << endl << max;

    cout << "\nsorted array is : " << endl;

    i.sort(n);

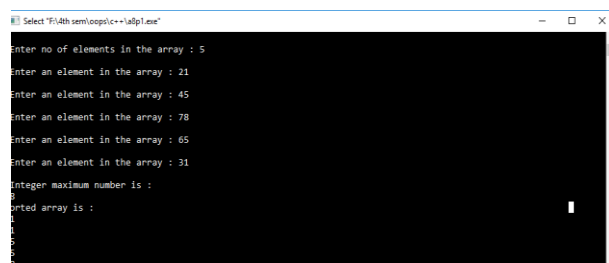
    i.display(n);

    getch();

    return 0;

}

```



The screenshot shows a Windows-style application window titled "Select 'F:\4th sem\oop\c++\alp1.exe'". The console output is as follows:

```

Enter no of elements in the array : 5
Enter an element in the array : 21
Enter an element in the array : 45
Enter an element in the array : 78
Enter an element in the array : 65
Enter an element in the array : 31
Integer maximum number is :
9
orted array is :
1
1
5
5
8

```

Note: There is a typo in the output "orted array is" which should be "sorted array is".

```

// assignment 8 program 2
/*
Write a function template for finding the minimum value contained in an array
*/
#include<iostream>
#include<conio.h>
using namespace std;
// template <class x>
// x fun_name(x ar1,x ar2.....)
template <class t>
t minimum(t a[],int n);
template <class t>
t minimum(t a[],int n)
{

    t min=a[0];
    for(int i=0;i<n;i++){
        if(a[i]<min){
            min=a[i];
        }
    }
    return min;

}

int main(){

```

```
int arr[1000];

int n;

cout << "\n Enter elements in the array : ";

cin >> n;

for(int i=0;i<n;i++){

    cout << "\n Enter an element in the array : ";

    cin >> arr[i];

}

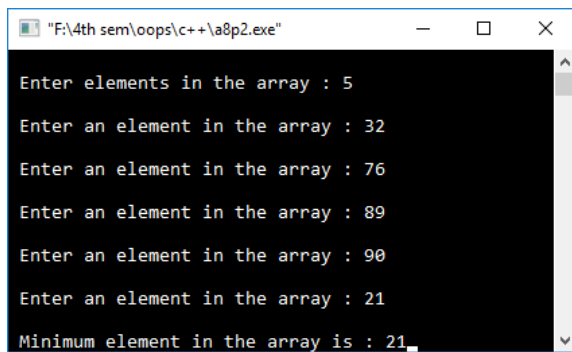
int min=minimum(arr,n);

cout << "\n Minimum element in the array is : " << min;

getch();

return 0;

}
```

A screenshot of a Windows command prompt window titled "F:\4th sem\oops\c++\a8p2.exe". The window has a black background with white text. It shows the execution of a C++ program. The first prompt is "Enter elements in the array : 5", where '5' is the user input. Then, there are five prompts "Enter an element in the array : " followed by inputs 32, 76, 89, 90, and 21. Finally, the program outputs "Minimum element in the array is : 21_".

```
"F:\4th sem\oops\c++\a8p2.exe"

Enter elements in the array : 5
Enter an element in the array : 32
Enter an element in the array : 76
Enter an element in the array : 89
Enter an element in the array : 90
Enter an element in the array : 21
Minimum element in the array is : 21_
```

// assignment 8 program 3

```
/*
```

```
Create a generic class stack using template and implement common Push and Pop operations  
for different data types.
```

```
*/
```

```
#include<iostream>
```

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

```
using namespace std;
```

```
template <class T>
```

```
class stack{
```

```
public:
```

```
    T stack[1000];
```

```
    int top=-1;
```

```
    int size;
```

```
    void push(T val){
```

```
        if(top==size-1){
```

```
            cout << "\n Stack overflow : ";
```

```
        }
```

```
        else{
```

```
            top++;
```

```
            stack[top]=val;
```

```
        }
```

```
    }
```

```
    T pop(T val){
```

```
        if(top== -1){
```

```
        cout << "\n Stack underflow : ";
        return 0;
    }
    else{

        val=stack[top];
        top--;
        return val;

    }

}

void display(){

    for(int i=top;i>=0;i--){
        cout << stack[i] << endl;
    }

}

};

int main(){
```



```

int n,val;

cout << "\n Enter no of maximum elements in the stack : ";

cin >> n;

stack<int> i;

for(int j=0;j<n;j++){

    cout << "\n Enter a value in stack : ";

    cin >> val;

    i.push(val);

}

i.display();

for(int j=0;j<n;j++){

    int pop_val=i.pop(val);

    cout << "\n Poped value is : " << pop_val;

}

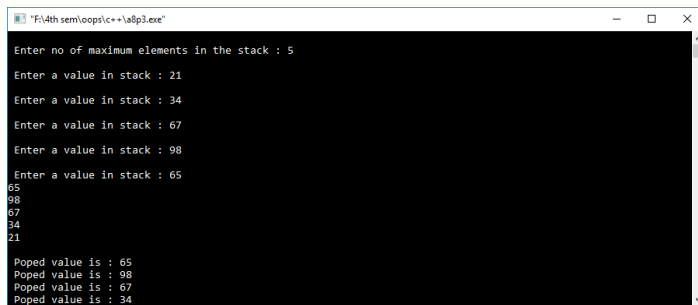
cout << endl ;

i.display();

return 0;

}

```



The screenshot shows a Windows command prompt window titled "F:\4th sem\oops\c++\a8p3.exe". The program's output is as follows:

```

Enter no of maximum elements in the stack : 5
Enter a value in stack : 21
Enter a value in stack : 34
Enter a value in stack : 67
Enter a value in stack : 98
Enter a value in stack : 65
65
98
67
34
21
Poped value is : 65
Poped value is : 98
Poped value is : 67
Poped value is : 34

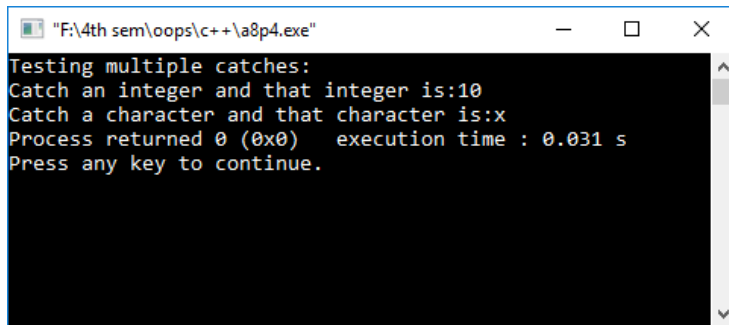
```

```
// assignment 8 program 4
```

```
/*
```

WAP that illustrates the application of multiple catch statements

```
*/
```



The screenshot shows a Windows command prompt window titled "F:\4th sem\oops\c++\a8p4.exe". The window has a black background with white text. The text displayed is as follows:

```
Testing multiple catches:  
Catch an integer and that integer is:10  
Catch a character and that character is:x  
Process returned 0 (0x0)   execution time : 0.031 s  
Press any key to continue.
```

```
// assignment 8 program 5
```

```
/*
```

W.A.P. that throws an arithmetic exception whenever the result of arithmetic computation becomes divisible by 3.

```
*/
```

```
#include<iostream>
```

```
using namespace std;
```

```
int main(){
```

```
int n1,n2;
```

```
int ans;
```

```
cout << "\n Enter two numbers :";
```

```
cin >> n1 >> n2;
```

```
try{
```

```
    if((n1-n2)%3==0){
```

```
        throw (n1-n2);
```

```
    }
```

```
    else{
```

```
        cout << "\n Answer is : " << n1/n2;
```

```
    }
```

```
}
```

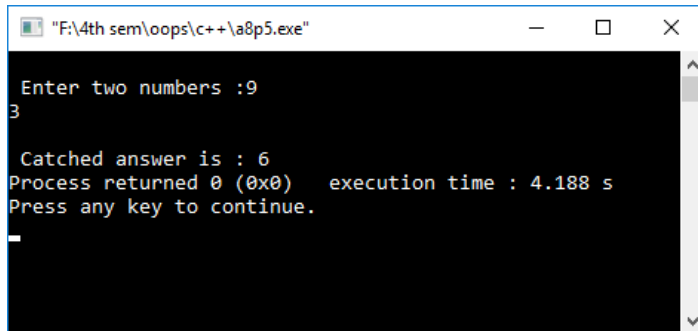
```
catch(int ans){
```

```
    cout << "\n Caught answer is : " << ans;
```

```
}
```

```
return 0;
```

```
}
```



```
"F:\4th sem\oops\c++\a8p5.exe"
Enter two numbers :9
3
Caught answer is : 6
Process returned 0 (0x0) execution time : 4.188 s
Press any key to continue.
```