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//1. Write a java program to create a generic stack and perform the operations.

import java.util.Scanner;
import java.lang.*;
class Stack <Y>
{
	int maxsize=10;
	int top=-1;
	Y[] array;
	Y i;
	Stack(Y[] a)
	{
		array=a;
	}
	public void display()
	{
		for(int j=0;j<=top;j++)
			System.out.println("E:" +array[j]);
	}
	public boolean isFull()
	{
		if(top+1==maxsize)
			return true;
		else
			return false;
	}
	public boolean isEmpty()
	{
		if(top==-1)
			return true;
		else
			return false;
	}
	public void push(Y element)
	{
		if(isFull())
			System.out.println("the stack is full");
		else
			array[++top]=element;
	}
	public void pop()
	{
		if(isEmpty())
		{
			System.out.println("the stack is empty");
		}
		else
		{
			i=array[top];
			top--;
			System.out.println("the popped element is "+i);
		}
	}
}
class Generics
{
	public static void main(String arg[])
	{

		int ch,ele,n;
		boolean wh=true;
		Scanner in=new Scanner(System.in);
		Integer[] a=new Integer[6];
```

```
            Stack<Integer> s=new Stack<Integer>(a);
            wh=true;
            System.out.println("Integer stack");
            while(wh)
            {
                  System.out.println("enter choice 1.push 2.pop 3.display
4.exit");
                  ch=in.nextInt();
                  switch(ch)
                  {
                        case 1:System.out.println("Enter element");
                                    ele=in.nextInt();
                                    s.push(ele);
                                    break;
                        case 2:s.pop();

                                    break;
                        case 3:s.display();
                              break;
                        case 4:wh=false;
                                    break;
                  }
            }
            System.out.println("enter strings for stacks");
            wh=true;
            String e;
            String[] sa=new String[6];
            System.out.println("String stack");
            Stack<String> s1=new Stack<String>(sa);
            wh=true;
            while(wh)
            {
                  System.out.println("enter choice 1.push 2.pop 3.display
4.exit");
                  ch=in.nextInt();
                  in.nextLine();
                  switch(ch)
                  {
                        case 1:System.out.println("Enter element");
                                    e=in.nextLine();
                                    s1.push(e);
                                    break;
                        case 2:s1.pop();

                                    break;
                        case 3:s1.display();
                              break;
                        case 4:wh=false;
                                    break;
                  }
            }
}
}


/*SAMPLE INPUT/OUTPUT
cs1050@wtl10:~/Desktop$ java Generics
Integer stack
enter choice 1.push 2.pop 3.display 4.exit
1
Enter element
1
enter choice 1.push 2.pop 3.display 4.exit
1
```

```
Enter element
2
enter choice 1.push 2.pop 3.display 4.exit
1
Enter element
3
enter choice 1.push 2.pop 3.display 4.exit
3
E:1
E:2
E:3
enter choice 1.push 2.pop 3.display 4.exit
2
the popped element is 3
enter choice 1.push 2.pop 3.display 4.exit
4
enter strings for stacks
String stack
enter choice 1.push 2.pop 3.display 4.exit
1
Enter element
hii
enter choice 1.push 2.pop 3.display 4.exit
1
Enter element
nice
enter choice 1.push 2.pop 3.display 4.exit
1
Enter element
meeting
enter choice 1.push 2.pop 3.display 4.exit
3
E:hii
E:nice
E:meeting
enter choice 1.push 2.pop 3.display 4.exit
4

*/



//2. Write a java program to find the maximum value from the given type of
elements using a generic function.

import java.util.Scanner;
import java.lang.*;
class Max
{

      <T extends Comparable> T findMax(T[] a,int n)
      {
            T max=a[0];
            for(int i=0;i<n;i++)
            {
                  if(a[i].compareTo(max)>0)
                        max=a[i];
            }
            return max;
      }
}
class Gen2
{
public static void main(String arg[])
```

```
{
System.out.println("Integer array");
Scanner in=new Scanner(System.in);
System.out.println("enter no of elements");
int n=in.nextInt();
int ele,j;
Integer[] array=new Integer[n];
System.out.println("enter elements ");
for(j=0;j<n;j++)
{
      ele=in.nextInt();
      array[j]=ele;
}
Max m=new Max();
System.out.println("the max value is "+m.findMax(array,n));


System.out.println("\nstring array");
System.out.println("enter no of elements");
n=in.nextInt();
in.nextLine();
String e;
String[] arr=new String[n];
System.out.println("enter strings ");
for(j=0;j<n;j++)
{
      e=in.nextLine();
      arr[j]=e;
}
Max m1=new Max();
System.out.println("the max value is "+m1.findMax(arr,n));}
}

/*SAMPLE INPUT/OUTPUT
cs1050@wtl10:~/Desktop$ java Gen2
Integer array
enter no of elements
5
enter elements
2
4
6
9
0
the max value is 9

string array
enter no of elements
4
enter strings
hii
hiii
hey
good
the max value is hiii
*/


//3. Perform a sorting operation on various types of elements using generic
method.
import java.util.Scanner;
import java.lang.*;
class Max
{
```

```
      <T extends Comparable> void findMax(T[] a,int n)
      {
            T t;
            for(int i=0;i<n-1;i++)
                  for(int j=i+1;j<n;j++)
            {
                  if(a[i].compareTo(a[j])>0)
                        {
                              t=a[i];
                              a[i]=a[j];
                              a[j]=t;
                        }
            }
            System.out.println("the sorted array is");
            for(int k=0;k<n;k++)
                  System.out.println(a[k]);
      }
}
class Gen2
{
public static void main(String arg[])
{
System.out.println("Integer array");
Scanner in=new Scanner(System.in);
System.out.println("enter no of elements");
int n=in.nextInt();
int ele,j;
Integer[] array=new Integer[n];
System.out.println("enter elements ");
for(j=0;j<n;j++)
{
      ele=in.nextInt();
      array[j]=ele;
}
Max m=new Max();
m.findMax(array,n);


System.out.println("\nstring array");
System.out.println("enter no of elements");
n=in.nextInt();
in.nextLine();
String e;
String[] arr=new String[n];
System.out.println("enter strings ");
for(j=0;j<n;j++)
{
      e=in.nextLine();
      arr[j]=e;
}
Max m1=new Max();
m1.findMax(arr,n);}
}

/*SAMPLE INPUT/OUTPUT
C:\Users\gayathri\Desktop>java Gen2
Integer array
enter no of elements
5
enter elements
5
4
3
```

```
2
1
the sorted array is
1
2
3
4
5

string array
enter no of elements
5
enter strings
h
hii
hiii
hiii
hello
the sorted array is
h
hello
hii
hiii
hiii

*/
```