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Estructura de Datos

Grupo:1360(2025-1)

# Tarea 11.- Ejercicios de recursión.

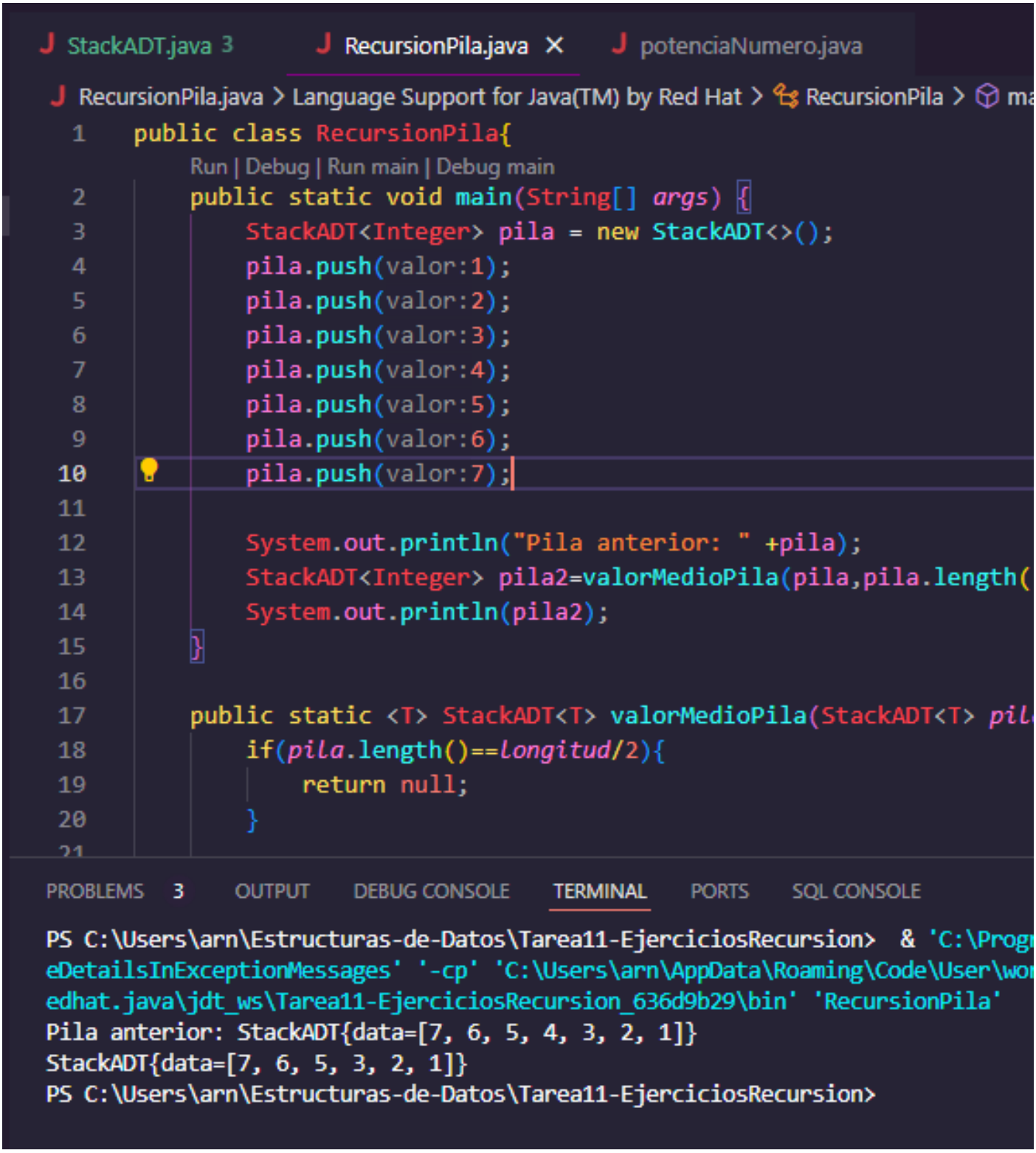
21 de octubre de 2024

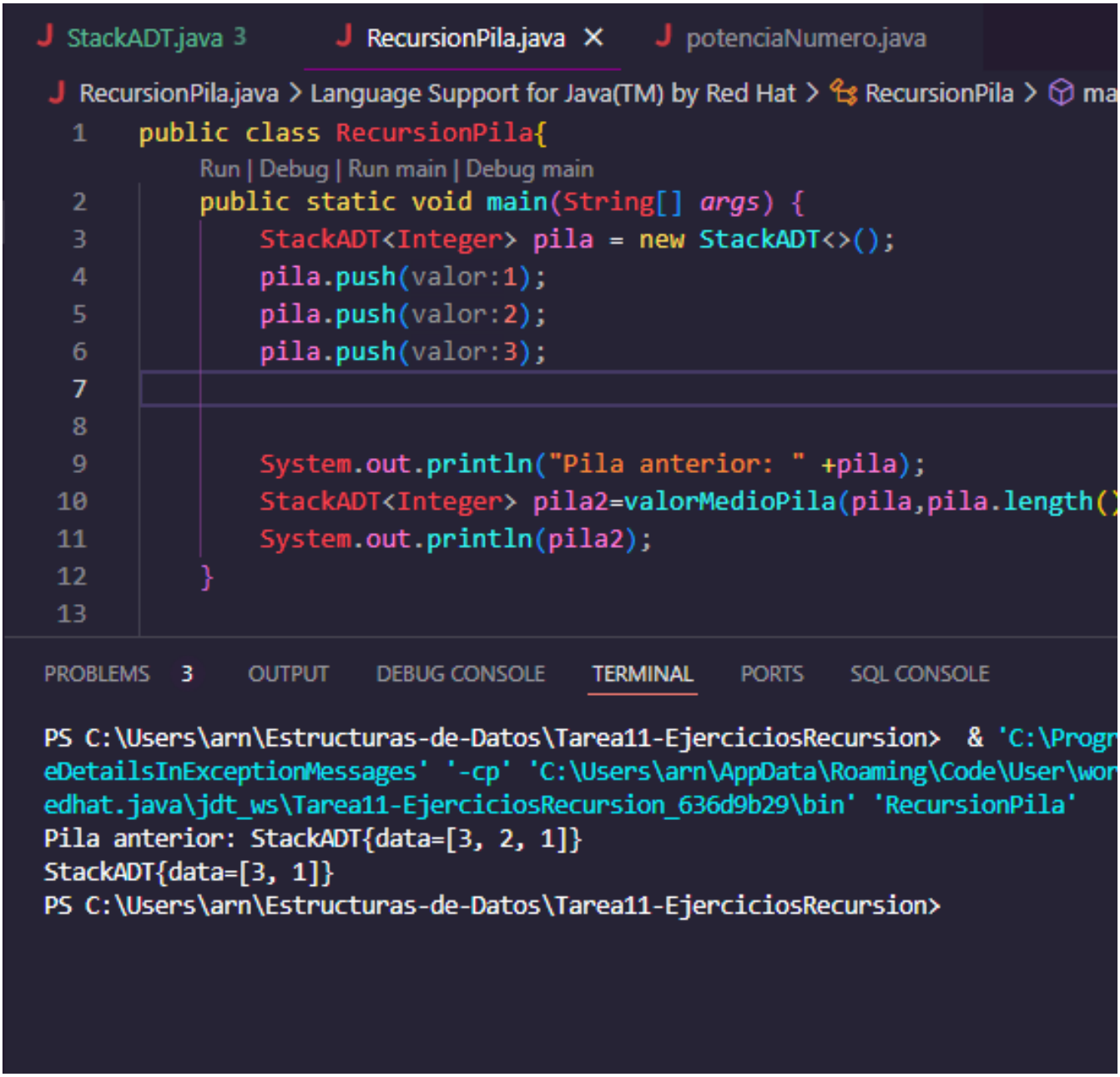
```java
public class RecursionPila{
    public static void main(String[] args) {
        StackADT<Integer> pila = new StackADT<>();
        pila.push(1);
        pila.push(2);
        pila.push(3);
        pila.push(4);
        pila.push(5);
        pila.push(6);
        pila.push(7);
        StackADT<Integer> pila2=valorMedioPila(pila,pila.length());
        System.out.println(pila2);
    }

    public static <T> StackADT<T> valorMedioPila(StackADT<T> pila, int longitud){
        if(pila.length()==longitud/2){
            return null;
        }

        T valor = pila.pop();

        if(valorMedioPila(pila,longitud)!=null){
            pila.push(valor);
        }

        return pila;
    }
}
```

```java
import java.util.LinkedList;

public class StackADT<T> {
    private LinkedList<T> data;
    private long maxLength=Integer.MAX_VALUE;

    public StackADT(){
        this.data=new LinkedList<>();
    }
    public StackADT(int x){
        this.data=new LinkedList<>();
        this.maxLength=x;
    }


    public boolean isEmpty(){
        boolean res = false;
        if (this.data.size() == 0){
            res = true;
        }
```

```
        return res;
    }

    public int length(){
        return this.data.size();
    }

    public T pop(){
        if(this.length()==0){
            System.out.println("No hay elementos para sacar");
            return null;
        }

        return data.removeFirst();


    }

    public T peek(){
        if(this.length()==0){
            System.out.println("Ya no hay elementos");
            return null;
        }
        return data.peekFirst();


    }

    public void push(T valor){
        if(this.length()==this.maxLength){
            System.out.println("Maxima longitud alcanzada, no se pueden almacenar mas
elementos");
        }else{
            data.addFirst(valor);
        }
    }

    public boolean isFull(){
        if(this.length()==this.maxLength){
            return false;
        }
        return true;
    }

    @Override
    public String toString() {
        return "StackADT{" +
                "data=" + data +
                '}';
```

```
    }
}
```


StackADT.java 3
RecursionPila.java
potenciaNumero.java
RecursionPila.java > Language Support for Java(TM) by Red Hat > RecursionPila > ma
public class RecursionPila{
Run | Debug | Run main | Debug main
public static void main(String[] args) {
StackADT<Integer> pila = new StackADT<>();
pila.push(valor:1);
pila.push(valor:2);
pila.push(valor:3);
pila.push(valor:4);
pila.push(valor:5);
pila.push(valor:6);
pila.push(valor:7);
System.out.println("Pila anterior: " +pila);
StackADT<Integer> pila2=valorMedioPila(pila,pila.length(
System.out.println(pila2);
}
public static <T> StackADT<T> valorMedioPila(StackADT<T> pil
if(pila.length()==longitud/2){
return null;
}
PROBLEMS 3
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
SQL CONSOLE
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion> & 'C:\Progr
eDetailsInExceptionMessages' '-cp' 'C:\Users\arn\AppData\Roaming\Code\User\wor
edhat.java\jdt_ws\Tarea11-EjerciciosRecursion_636d9b29\bin' 'RecursionPila'
Pila anterior: StackADT{data=[7, 6, 5, 4, 3, 2, 1]}
StackADT{data=[7, 6, 5, 3, 2, 1]}
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion>


StackADT.java 3
RecursionPila.java
potenciaNumero.java
RecursionPila.java > Language Support for Java(TM) by Red Hat > RecursionPila > ma
public class RecursionPila{
Run | Debug | Run main | Debug main
public static void main(String[] args) {
StackADT<Integer> pila = new StackADT<>();
pila.push(valor:1);
pila.push(valor:2);
pila.push(valor:3);
System.out.println("Pila anterior: " +pila);
StackADT<Integer> pila2=valorMedioPila(pila,pila.length(
System.out.println(pila2);
}
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SQL CONSOLE
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edhat.java\jdt_ws\Tarea11-EjerciciosRecursion_636d9b29\bin' 'RecursionPila'
Pila anterior: StackADT{data=[3, 2, 1]}
StackADT{data=[3, 1]}
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion>

StackADT.java 3 | RecursionPila.java | potenciaNumero.java

RecursionPila.java > Language Support for Java(TM) by Red Hat > RecursionP

```
1   public class RecursionPila{
2       public static void main(String[] args) {
5           pila.push(valor:2);
6           pila.push(valor:3);
7           pila.push(valor:4);
8           pila.push(valor:5);
9           pila.push(valor:6);
10
11
12          System.out.println("Pila anterior: " +pila);
13          StackADT<Integer> pila2=valorMedioPila(pila,pila
14          System.out.println(pila2);
15      }
16
```

PROBLEMS 3 | OUTPUT | DEBUG CONSOLE | TERMINAL | PORTS | SQL CONSOLE

```
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion>  &
eDetailsInExceptionMessages' '-cp' 'C:\Users\arn\AppData\Roaming\Cod
edhat.java\jdt_ws\Tarea11-EjerciciosRecursion_636d9b29\bin' 'Recursi
Pila anterior: StackADT{data=[6, 5, 4, 3, 2, 1]}
StackADT{data=[6, 5, 3, 2, 1]}
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion>
```

```java
public class potenciaNumero {
    public static void main(String[] args) {
        System.out.println(potencia(3, 4));
    }

    public static int potencia(int numero,int exponente){
        if(exponente==0){
            return 1;
        }

        return numero*potencia(numero, exponente-1);
    }
}
```

StackADT.java 3 | RecursionPila.java | potenciaNumero.java

potenciaNumero.java > Language Support for Java(TM) by Red Hat > potenciaNumero > potencia(int, int)

```java
public class potenciaNumero {
    Run | Debug | Run main | Debug main
    public static void main(String[] args) {
        System.out.println(x:"3 a la 4:"  );
        System.out.println(potencia(numero:3, exponente:4));
    }

    public static int potencia(int numero,int exponente){
        if(exponente==0){
            return 1;
        }

        return numero*potencia(numero, exponente-1);
    }
}

```

PROBLEMS 3 OUTPUT DEBUG CONSOLE TERMINAL PORTS SQL CONSOLE

```
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion>  & 'C:\Program Files\Java\jdk-2
eDetailsInExceptionMessages' '-cp' 'C:\Users\arn\AppData\Roaming\Code\User\workspaceStorage\dcf3c
edhat.java\jdt_ws\Tarea11-EjerciciosRecursion_636d9b29\bin' 'potenciaNumero'
3 a la 4:
81
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion>
```


StackADT.java 3
RecursionPila.java
potenciaNumero.java
potenciaNumero.java > Language Support for Java(TM) by Red Hat > potencia
public class potenciaNumero {
Run | Debug | Run main | Debug main
public static void main(String[] args) {
System.out.println(x:"7 a la 3:" );
System.out.println(potencia(numero:7,exponente:3)
}
public static int potencia(int numero,int exponente){
if(exponente==0){
return 1;
}
return numero*potencia(numero, exponente-1);
}
}
PROBLEMS 3
OUTPUT
DEBUG CONSOLE
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PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion> &
eDetailsInExceptionMessages' '-cp' 'C:\Users\arn\AppData\Roaming\Code
edhat.java\jdt_ws\Tarea11-EjerciciosRecursion_636d9b29\bin' 'potencia
7 a la 3:
343
PS C:\Users\arn\Estructuras-de-Datos\Tarea11-EjerciciosRecursion>