

Unidade V:

Estruturas de Dados Básicas

com Alocação Flexível - Pilha

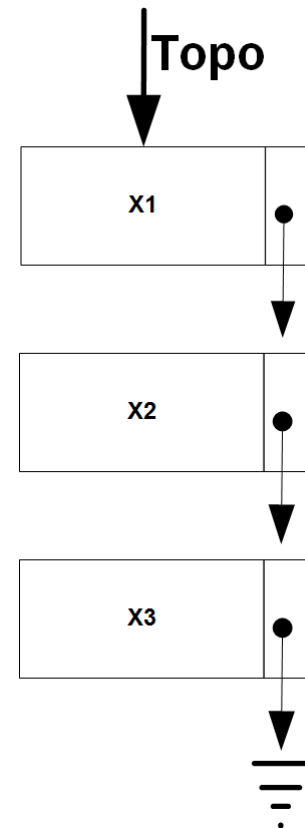
Prof. Max do Val Machado



PUC Minas

Instituto de Ciências Exatas e Informática
Curso de Ciência da Computação

- [PrincipalPilha.java](#), igual ao da estrutura sequencial
- [Pilha.java](#), criará instâncias como:

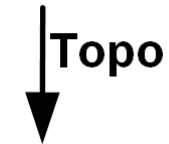


Classe Pilha

```
class Pilha {  
    private Celula topo;  
    public Pilha () {  
        topo = null;  
    }  
    public void inserir(int x) { ... }  
    public int remover() { ... }  
    public void mostrar() { ... }  
}
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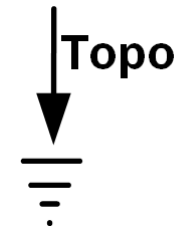
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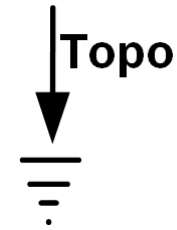
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Inserir (ou Empilhar)

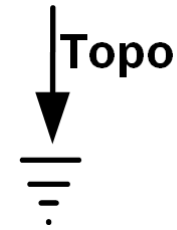
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```
public void inserir(int x) {  
    Celula tmp = new Celula(x);  
    tmp.prox = topo;  
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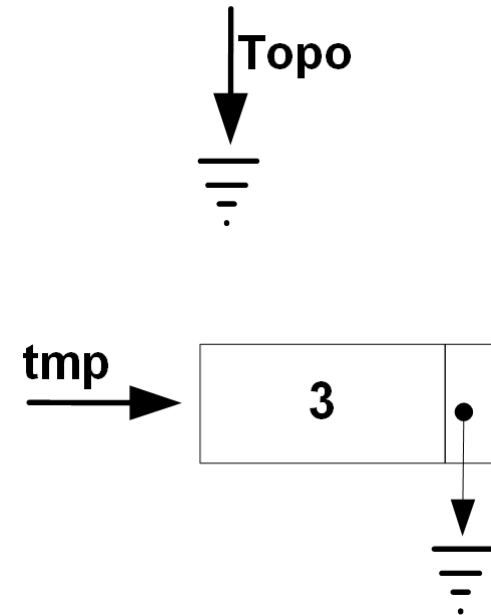


```
public void inserir(int x) { //Inserir(3)  
    Celula tmp = new Celula(x);  
    tmp.prox = topo;  
    topo = tmp;  
    tmp = null;  
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```

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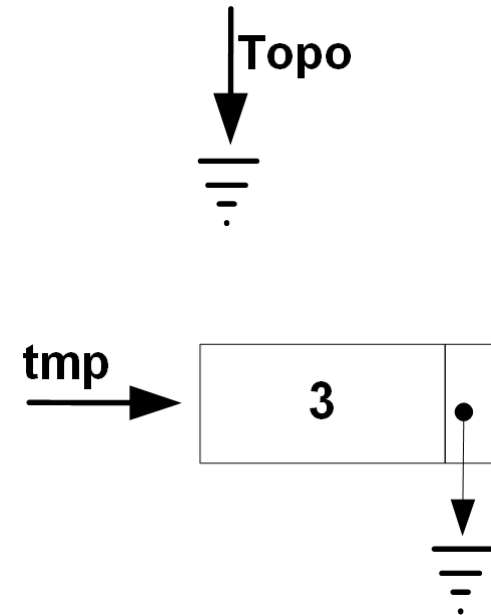
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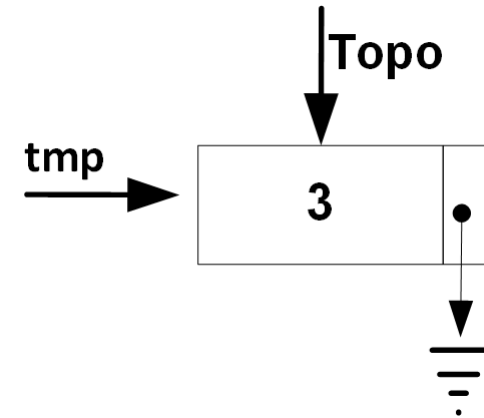


Como topo aponta para null, tmp.prox continua apontando para null

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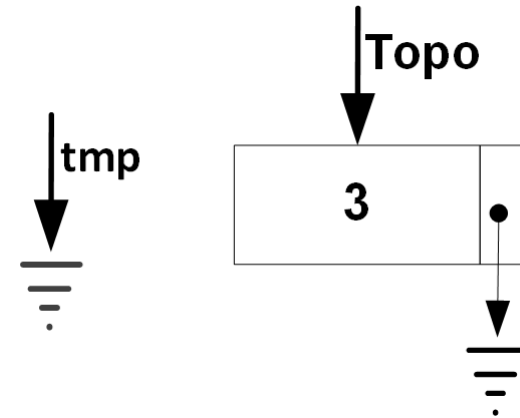
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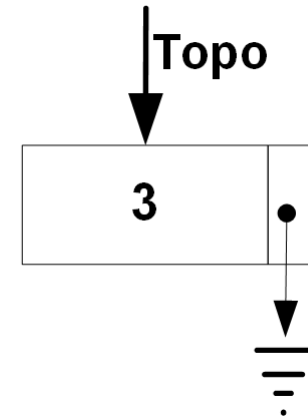
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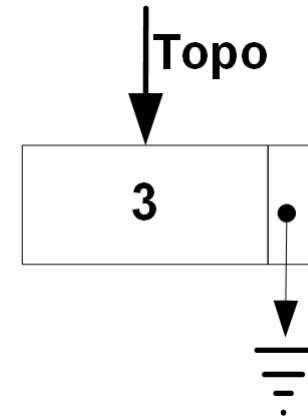
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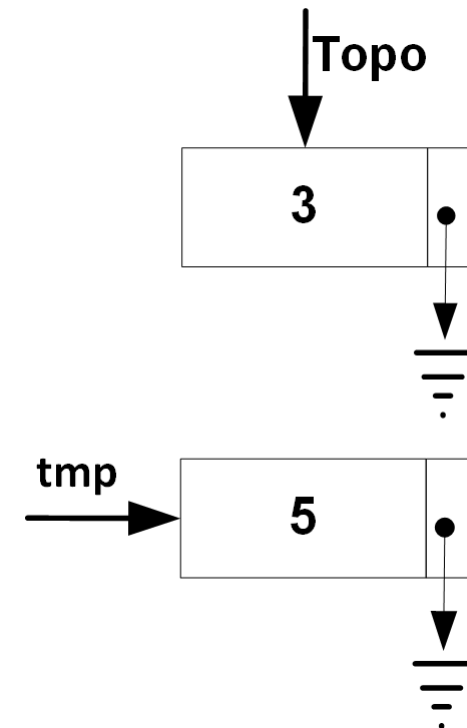


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public void inserir(int x) { //Inserir(5)  
    Celula tmp = new Celula(x);  
    tmp.prox = topo;  
    topo = tmp;  
    tmp = null;  
}
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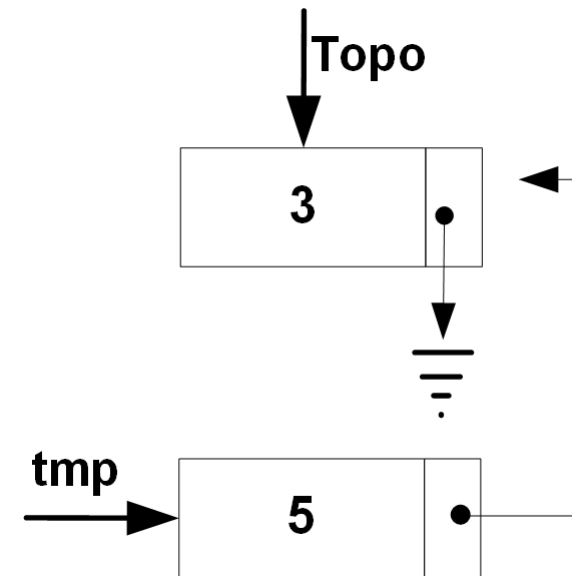
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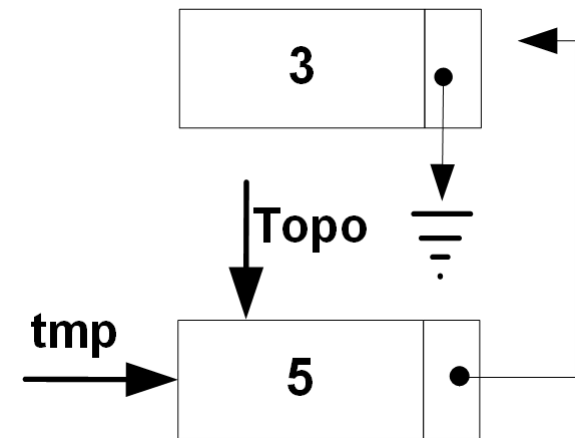
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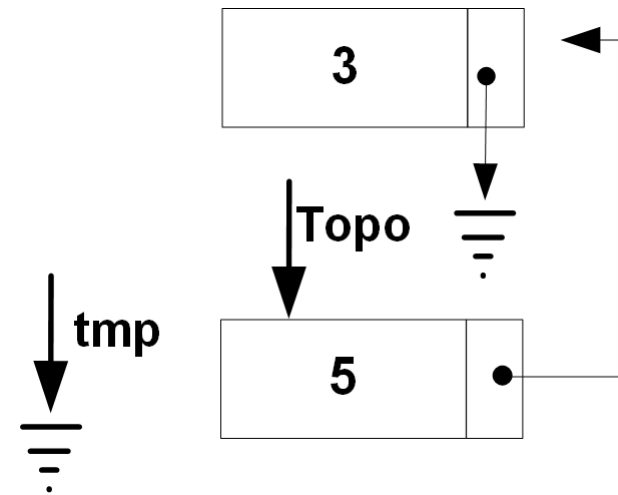
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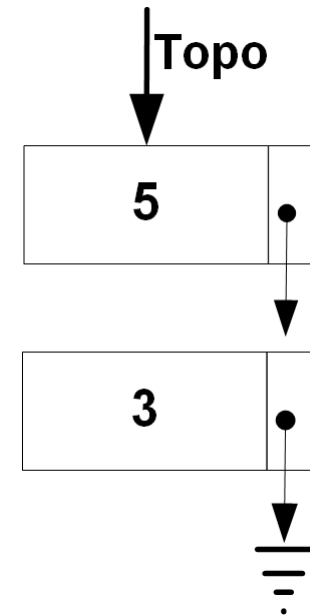
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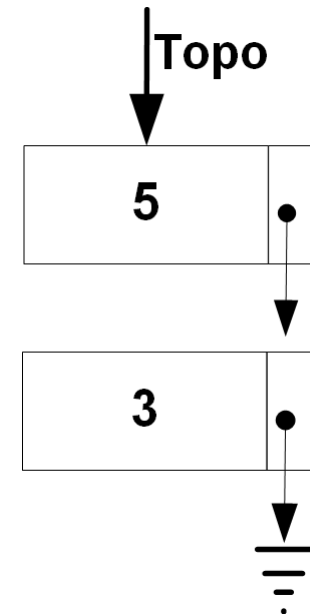
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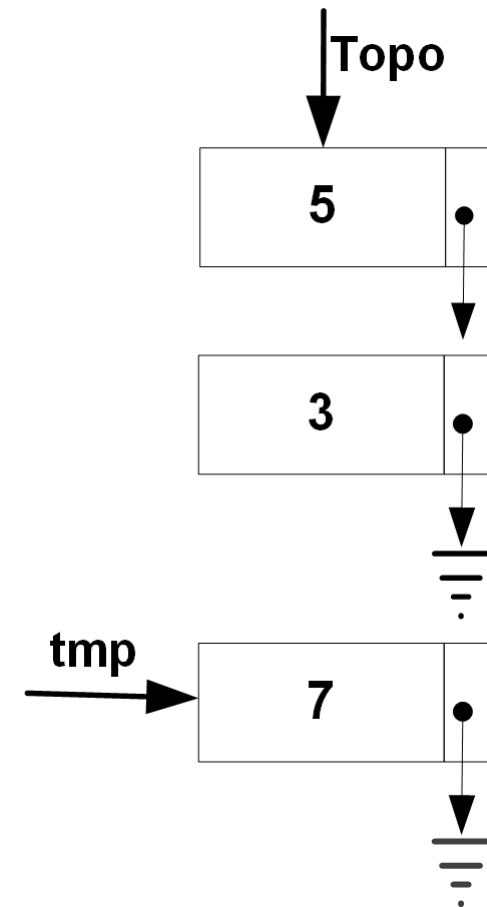
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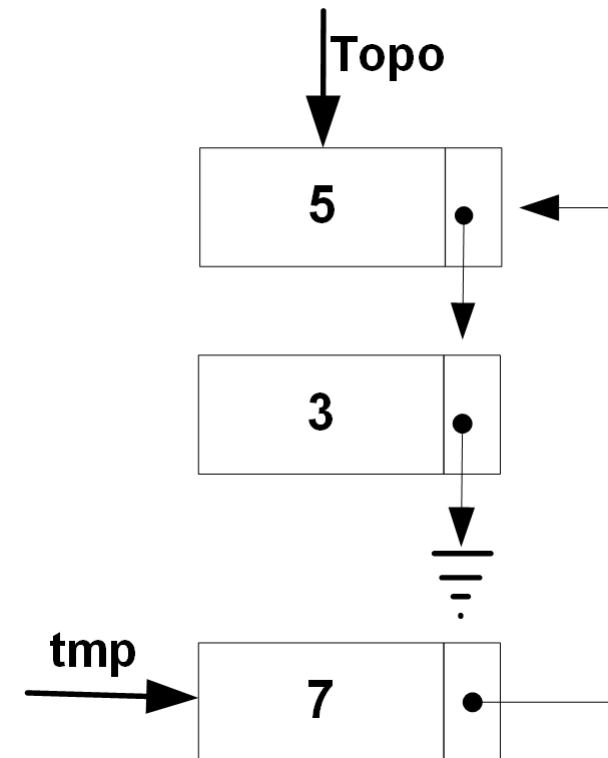
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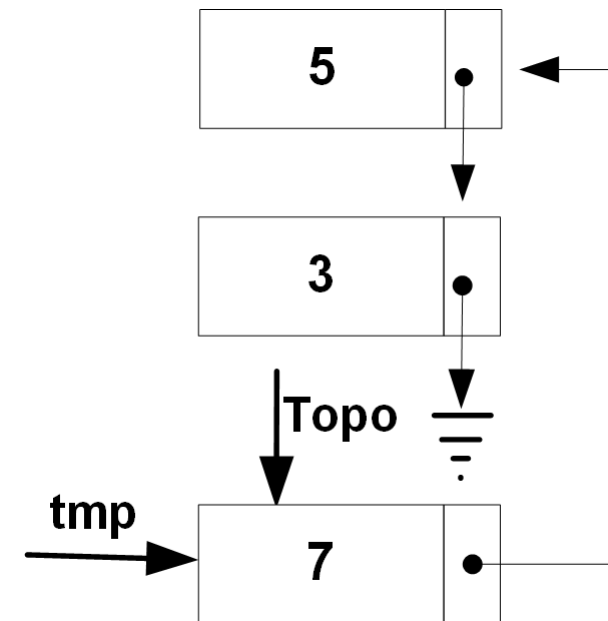
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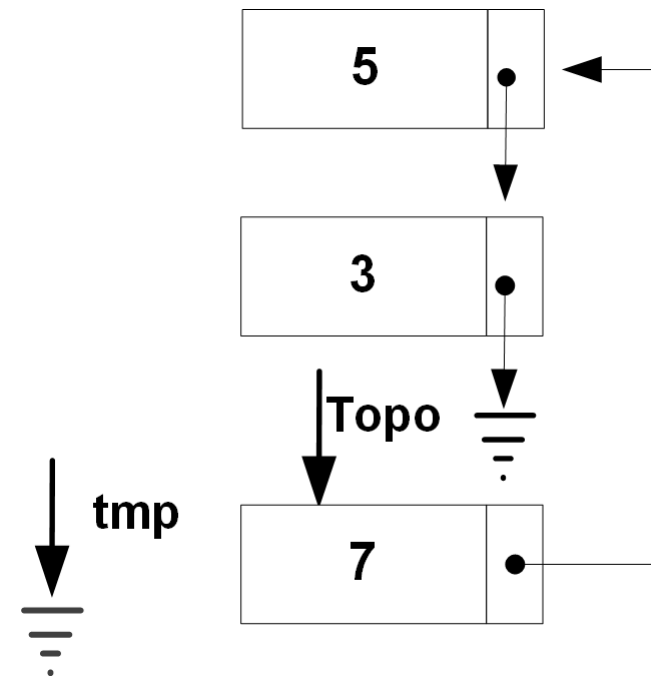
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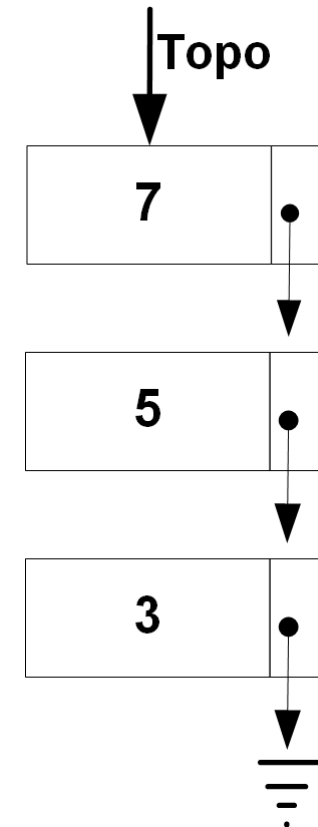
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Classe Pilha

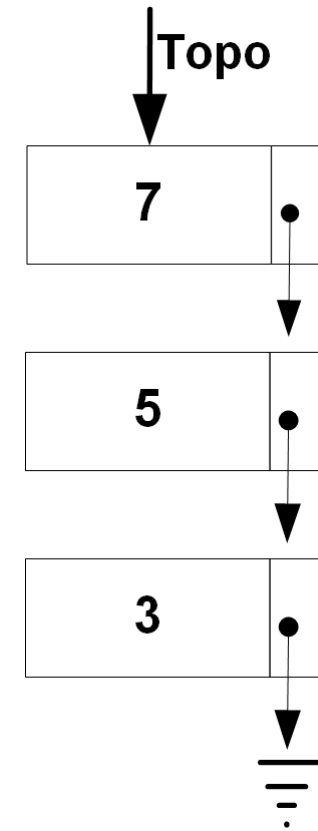
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Remover (ou Desempilhar)

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public int remover() throws Exception {  
    if (topo == null)  
        throw new Exception("Erro!");  
    int elemento = topo.elemento;  
    Celula tmp = topo;  
    topo = topo.prox;  
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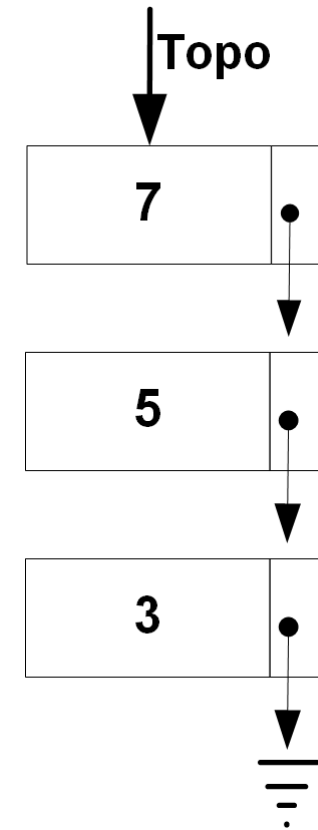
```
    tmp.prox = null;
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```
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```
    return elemento;
```

```
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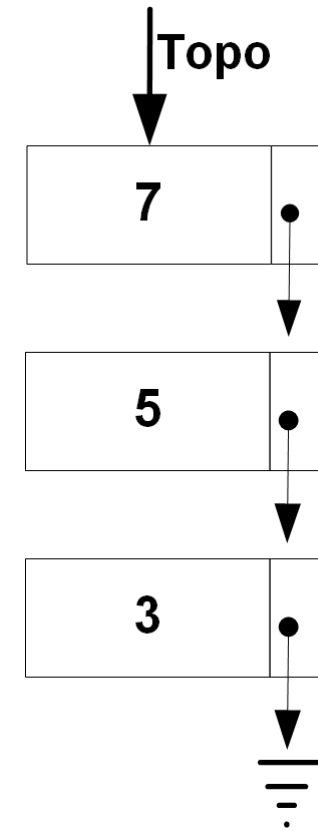
false



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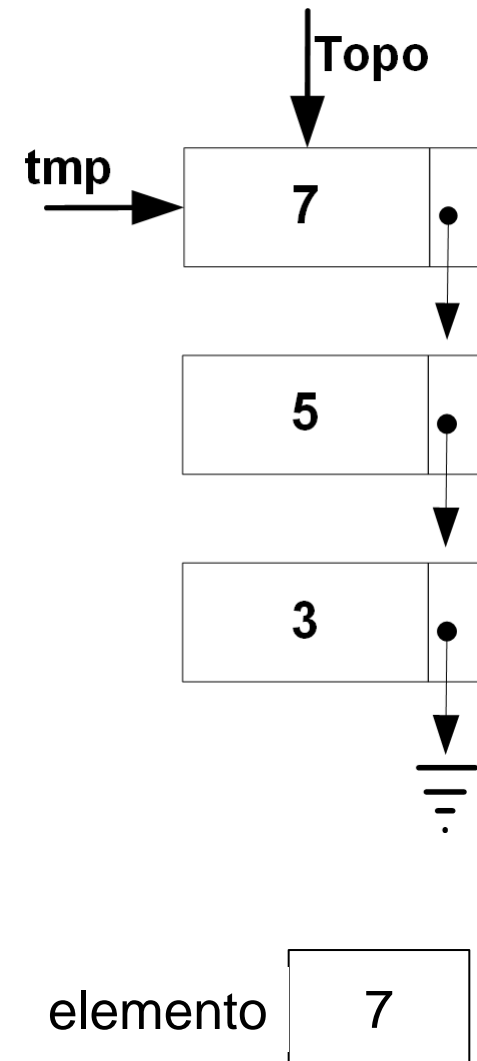
elemento

7

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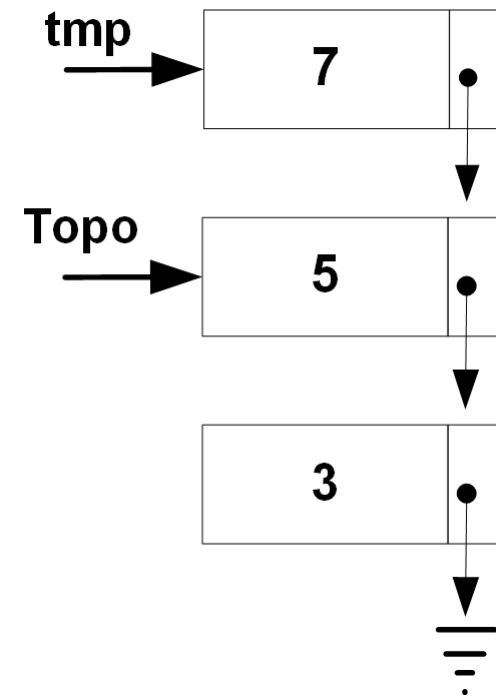
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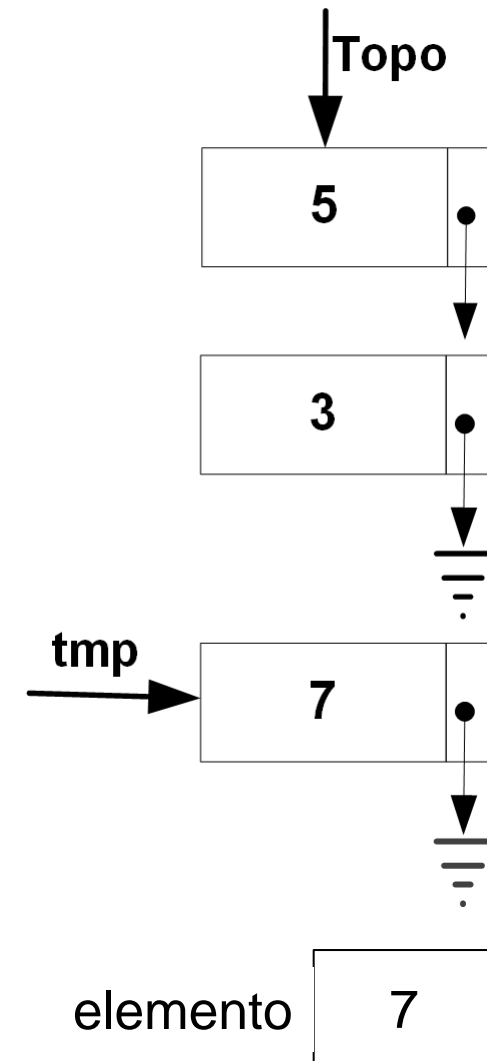
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7

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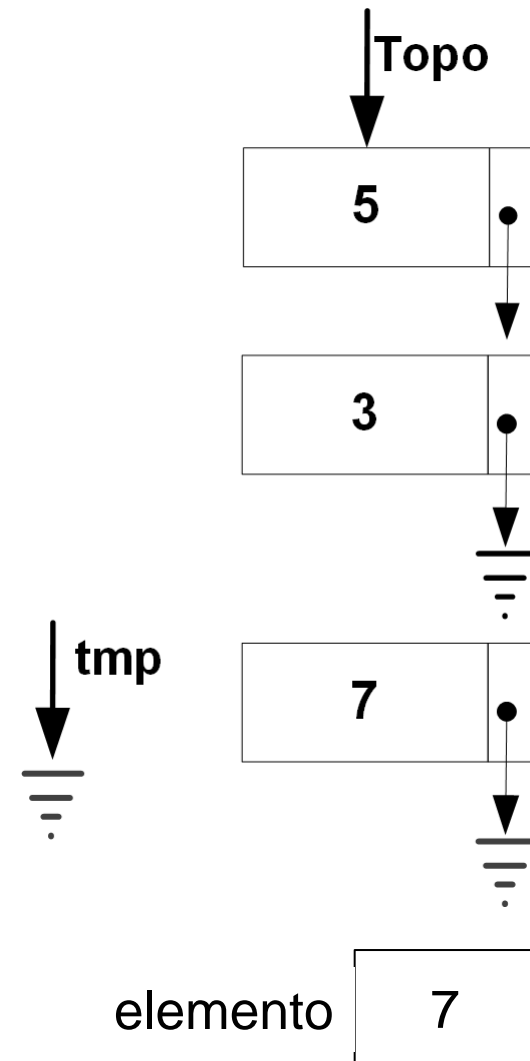
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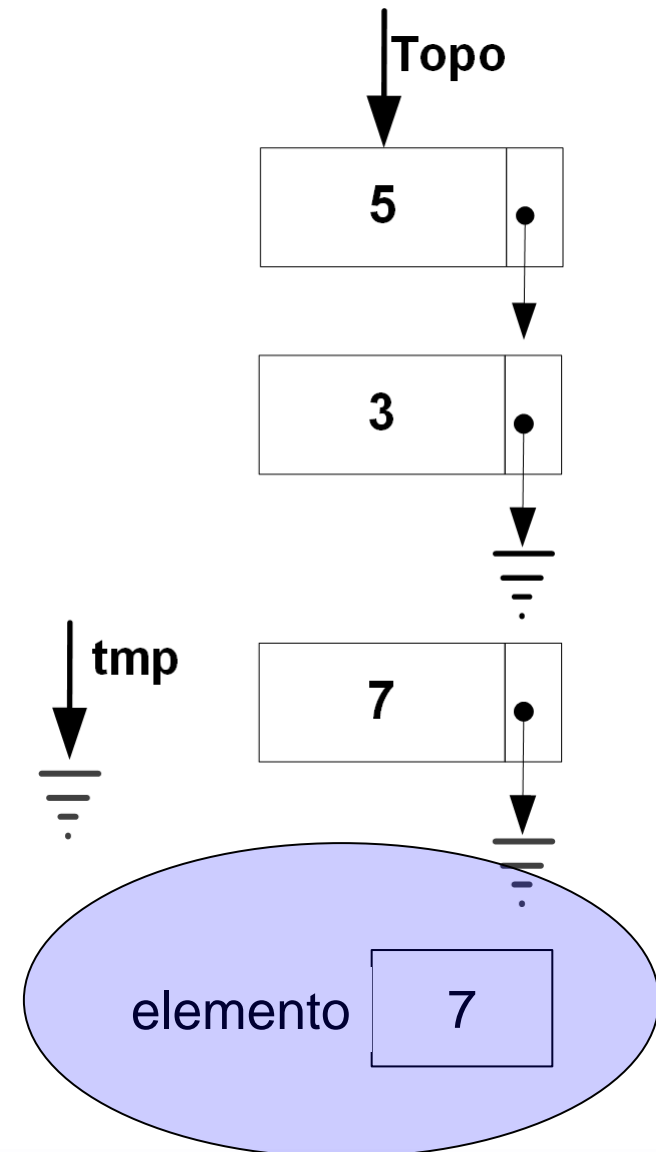
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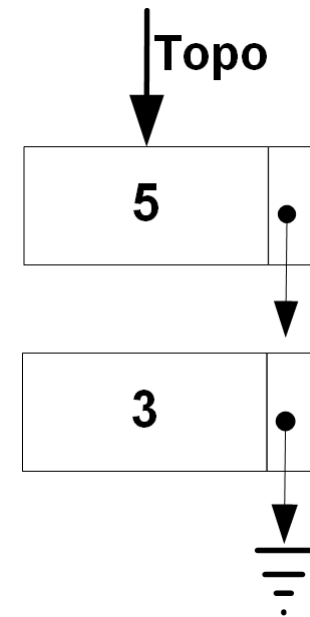
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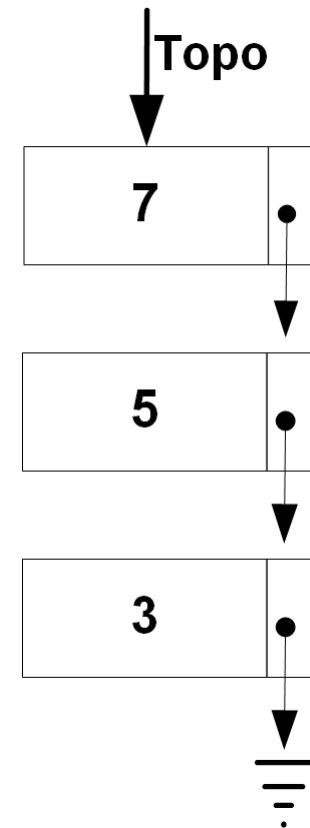
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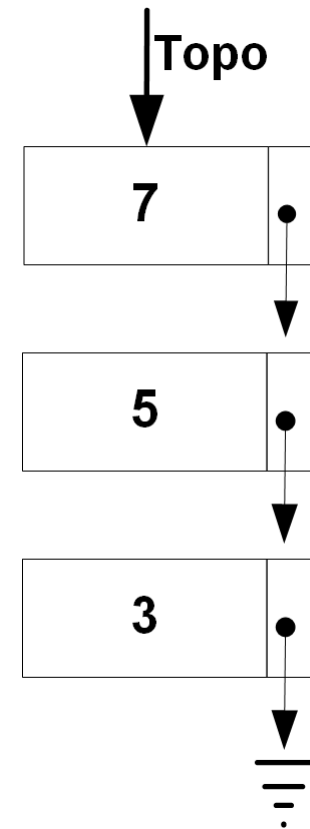
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    public int remover() { ... }  
    public void mostrar() { ... }  
}
```

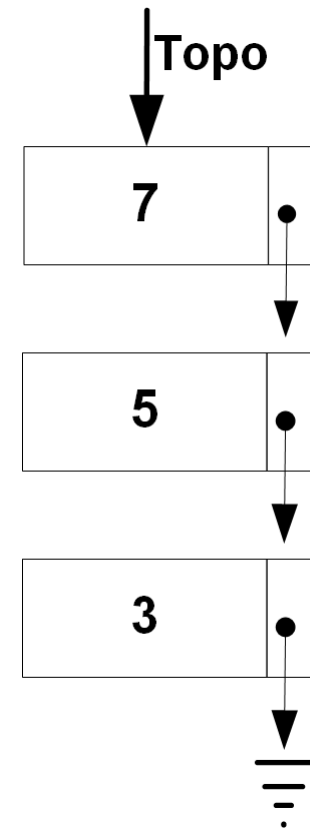
```
public void mostrar() {  
    System.out.print("[ ");  
    for (Celula i = topo; i != null; i = i.prox){  
        System.out.print(i.elemento + " ");  
    }  
    System.out.println("]");  
}
```



Saída
na tela

```
class Pilha {  
    private Celula topo;  
    public Pilha () {  
        topo = null;  
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    public void inserir(int x) { ... }  
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```

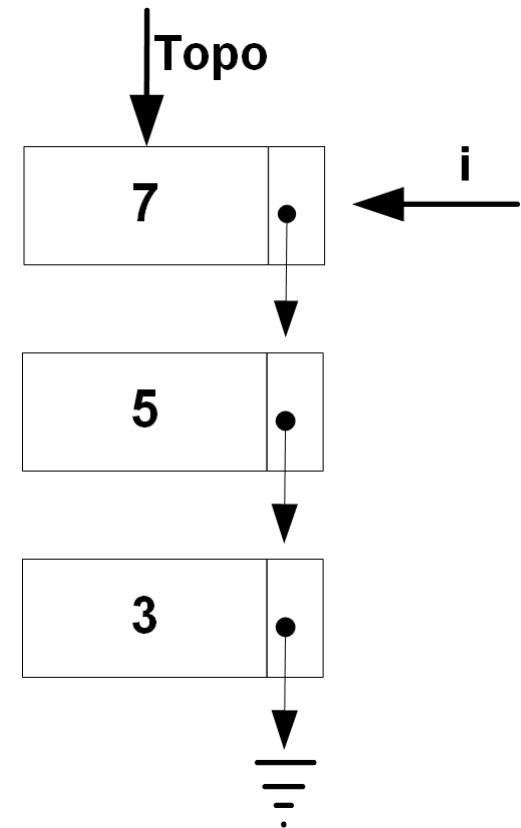


Saída
na tela

[

```
class Pilha {
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    public void inserir(int x) { ... }
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}
```



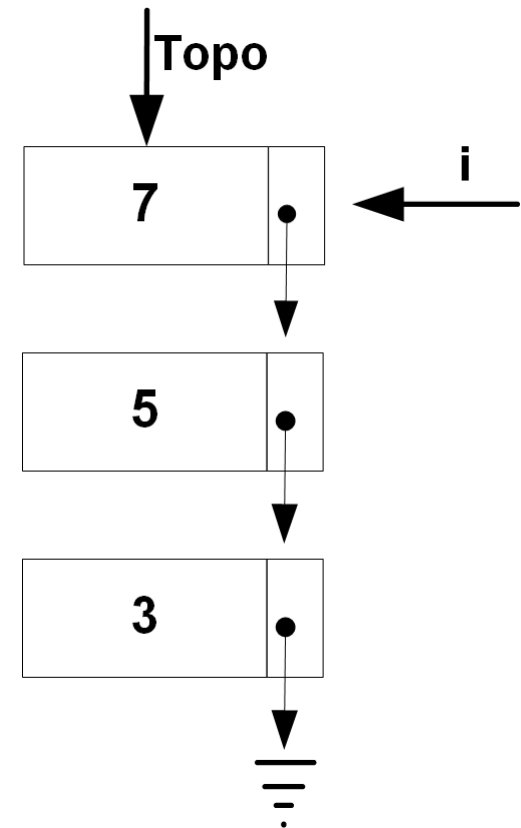
Saída
na tela

[

Mostrar

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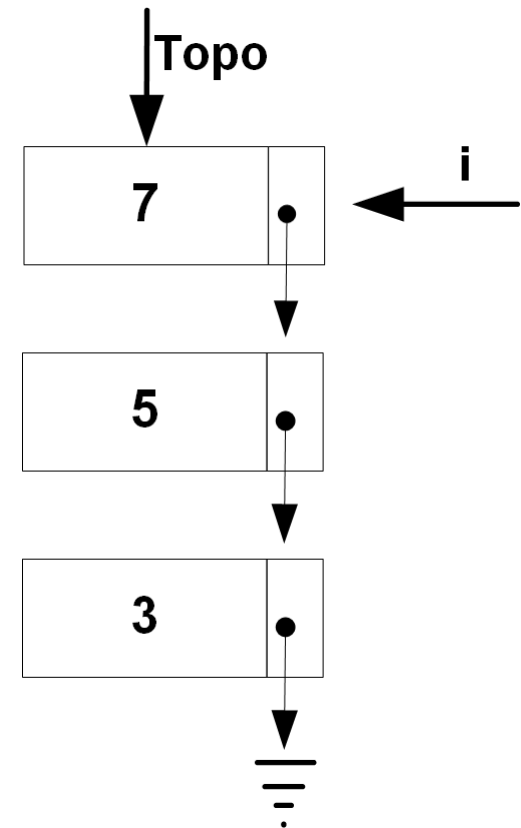


Saída
na tela

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    }  
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```

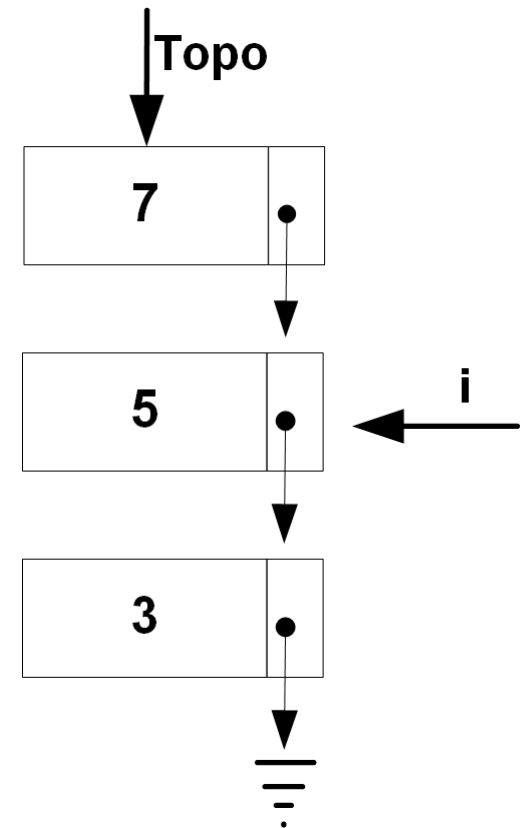


Saída
na tela

[7

```
class Pilha {  
    private Celula topo;  
    public Pilha () {  
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    }  
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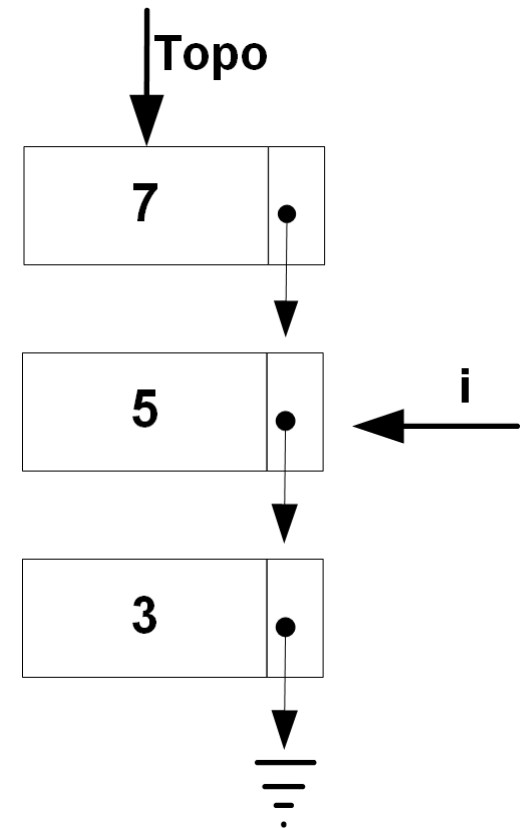
Saída
na tela

[7

Mostrar

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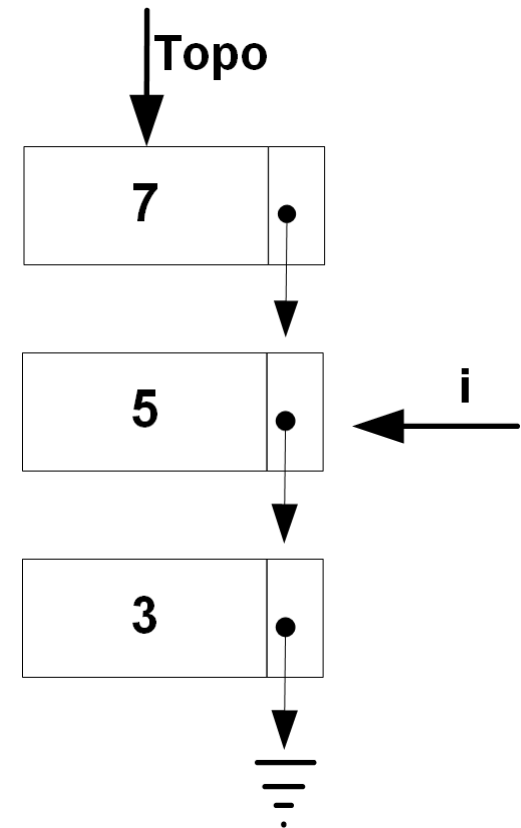


Saída
na tela

[7

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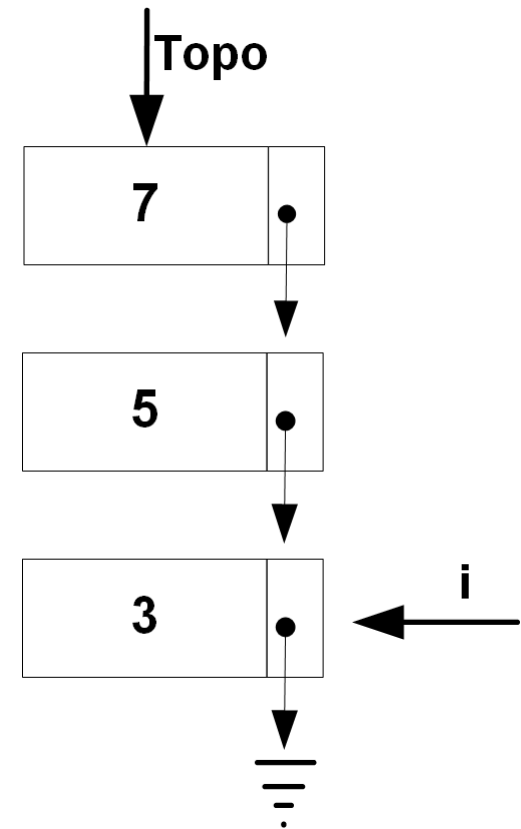


Saída
na tela

[7 5

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class Pilha {  
    private Celula topo;  
    public Pilha () {  
        topo = null;  
    }  
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    }  
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}
```



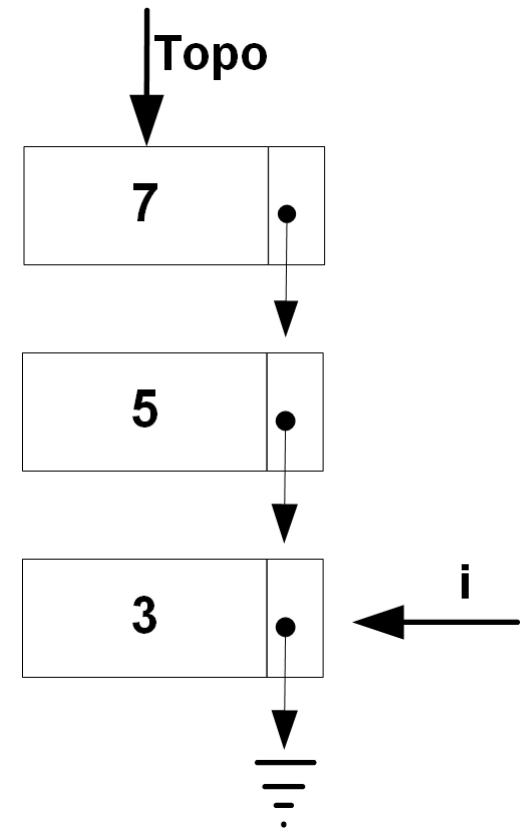
Saída
na tela

[7 5

Mostrar

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    }  
    System.out.println("]");  
}
```

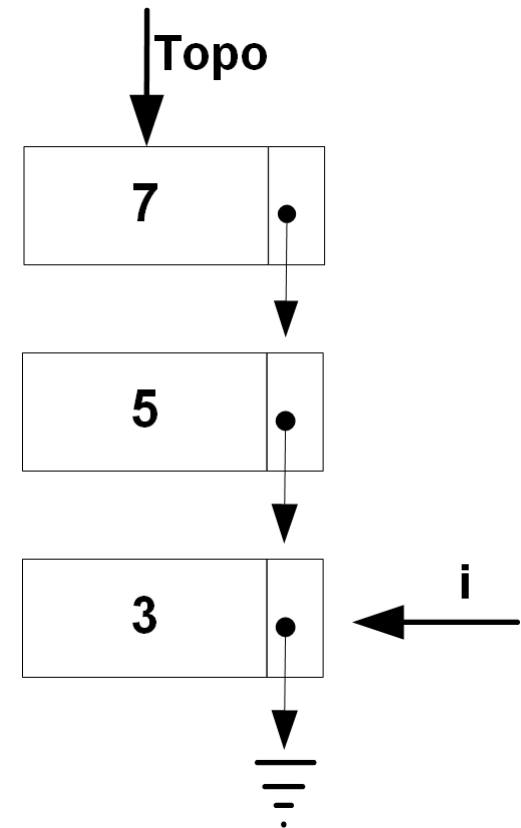


Saída
na tela

[7 5

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```

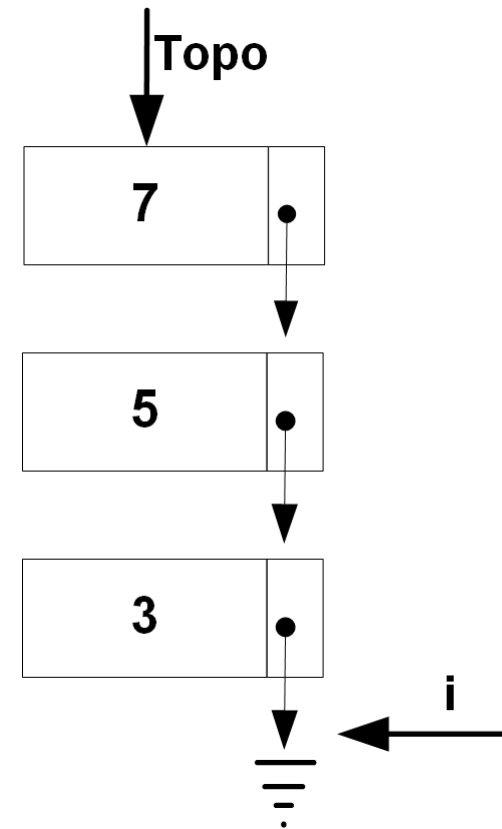


Saída
na tela

[7 5 3

```
class Pilha {  
    private Celula topo;  
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        topo = null;  
    }  
    public void inserir(int x) { ... }  
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    public void mostrar() { ... }  
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public void mostrar() {  
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        System.out.print(i.elemento + " ");  
    }  
    System.out.println("]");  
}
```



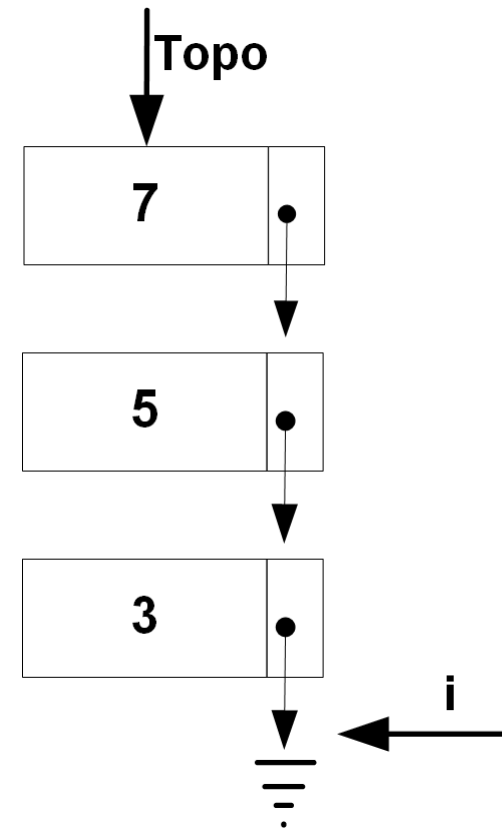
Saída
na tela

[7 5 3

Mostrar

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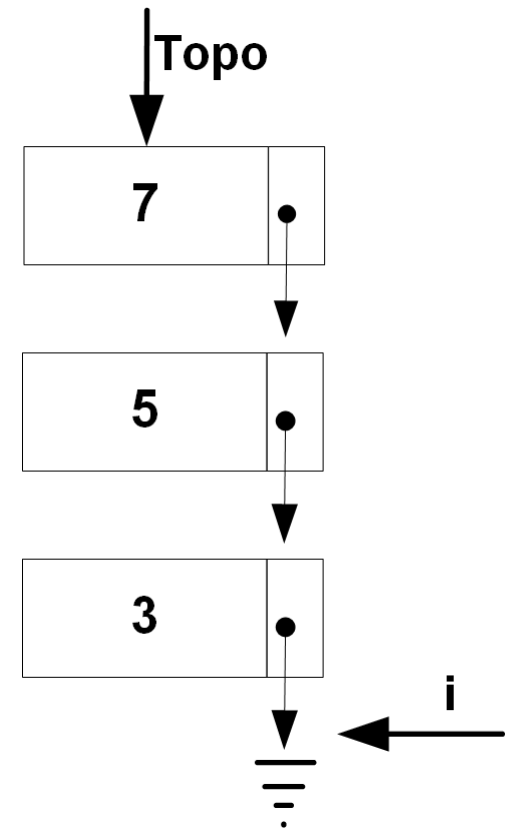


Saída
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[7 5 3

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Saída
na tela

[7 5 3]

Exercício

- Seja nossa Pilha, faça um método que soma o conteúdo dos elementos contidos na mesma

Exercício

- Seja nossa Pilha, faça um método que soma o conteúdo dos elementos contidos na mesma

```
int somar() {  
    int resp = 0;  
    for (Celula i = topo; i != null; i = i.prox) {  
        resp += i.elemento;  
    }  
    return resp;  
}
```