

FCT/Unesp – Presidente Prudente
Departamento de Matemática e Computação

Programação Orientada a Objetos

Classes e Objetos

Vetores

Prof. Dr. Danilo Medeiros Eler
danilo.eler@unesp.br

Programação Orientada a Objetos

- Classes
 - Atributos
 - Métodos
- Objetos
 - Instancia de uma classe
- Encapsulamento
 - Limitar o acesso a dados e ações à classe

Exemplos Desenvolvidos

Aluno
nome:String; RA:String; t1:float; t2:float; p1:float; p2:float;
float calcularMedia(); Boolean aprovado();

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    public Aluno(){
    }
    public Aluno(String nome, String ra,
float t1,float t2, float n1, float n2) {
        this.ra = ra;.....
    }
}
```

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
if (media() >= 5) {
    return true;
}
return false;
}
.....
}
```

Aluno
nome:String; RA:String; t1:float; t2:float; p1:float; p2:float;
float calcularMedia(); Boolean aprovado();

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

t2:float;

p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

a1 → null

Aluno
nome:String; RA:String; t1:float; t2:float; p1:float; p2:float;
float calcularMedia(); Boolean aprovado();

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno
nome:String; RA:String; t1:float; t2:float; p1:float; p2:float;
float calcularMedia(); Boolean aprovado();

a1 → null

<u>Aluno</u>
“”
“”
0
0
0
0

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno
nome:String;
RA:String;
t1:float;
t2:float;
p1:float;
p2:float;
float calcularMedia();
Boolean aprovado();

a1 → null

<u>Aluno</u>
"Aluno 3"
"123456"
0
0
0
0

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public Aluno(String nome, String ra) {
        this.ra = ra;
        this.nome = nome;
    }
    .....
```

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
}
```

<u>Aluno</u>
“”
“”
0
0
0
0

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public Aluno(String nome, String ra) {
        this.ra = ra;
        this.nome = nome;
    }
    .....
```

```
nome = "Aluno 3"
ra = "123456"
```

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
}
```

<u>Aluno</u>	
	“”
	“”
	0
	0
	0
	0

10

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public Aluno(String nome, String ra) {
        this.ra = ra;
        this.nome = nome;
    }
    .....
```

```
nome = "Aluno 3"
ra = "123456"
```

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
}
```

```
Aluno
""
"123456"
0
0
0
0
```

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public Aluno(String nome, String ra) {
        this.ra = ra;
        this.nome = nome;
    }
    .....
```

```
nome = "Aluno 3"
ra = "123456"
```

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
}
```

```
Aluno
"Aluno 3"
"123456"
0
0
0
0
```

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno
nome:String; RA:String; t1:float; t2:float; p1:float; p2:float;
float calcularMedia(); Boolean aprovado();

a1 → null

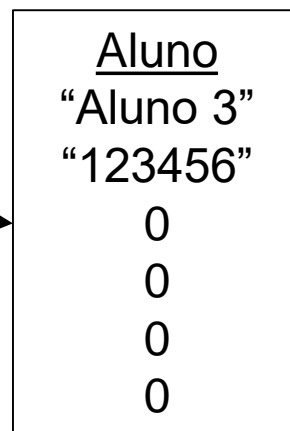
<u>Aluno</u>
"Aluno 3"
"123456"
0
0
0
0

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno
nome:String;
RA:String;
t1:float;
t2:float;
p1:float;
p2:float;
float calcularMedia();
Boolean aprovado();

a1



Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t1 = 7

.....

```
public void setT1(float t1) {  
    this.t1 = t1;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

.....

```
}
```

```
Aluno  
"Aluno 3"  
"123456"  
0  
0  
0  
0
```

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
```

t1 = 7

.....

```
public void setT1(float t1) {
    this.t1 = t1;
}
```

.....

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}
```

```
public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
```

.....

```
}
```

```
Aluno
"Aluno 3"
"123456"
7
0
0
0
```


Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

t2:float;

p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();

a1

Aluno

"Aluno 3"

"123456"

7

0

0

0

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

.....

```
}
```

```
Aluno  
"Aluno 3"  
"123456"  
7  
0  
0  
0
```

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

.....

```
}
```

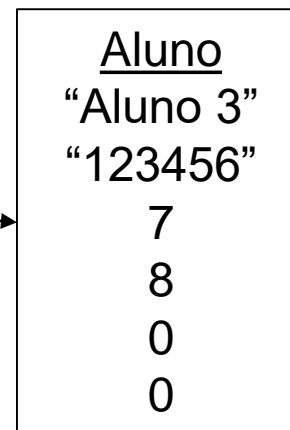
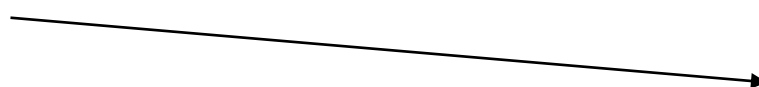
```
Aluno  
"Aluno 3"  
"123456"  
7  
8  
0  
0
```

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno
nome:String; RA:String; t1:float; t2:float; p1:float; p2:float;
float calcularMedia(); Boolean aprovado();

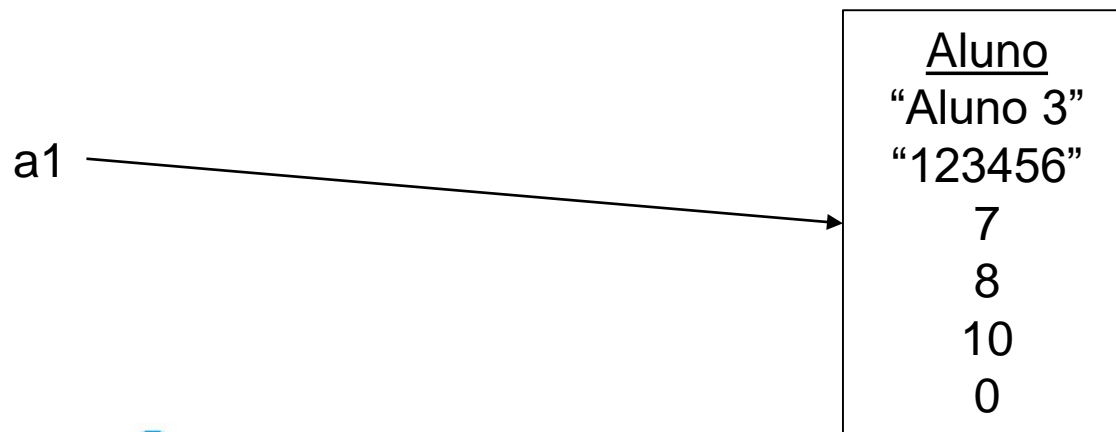
a1



Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno
nome:String; RA:String; t1:float; t2:float; p1:float; p2:float;
float calcularMedia(); Boolean aprovado();



Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

t2:float;

p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();

a1

Aluno

"Aluno 3"

"123456"

7

8

10

7

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

t2:float;

p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();

a1
m = 0

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public void setT2(float t2) {
        this.t2 = t2;
    }
    .....
```

t2 = 8

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {
    this.t2 = t2;
}
```

.....

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}
```

(7+8+10+7)/4.0

```
public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
```

.....
}

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

(32)/4.0

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

.....

```
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {
    this.t2 = t2;
}
```

.....

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}
```

8

```
public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
```

.....
}

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

media = 8

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

.....

```
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

t2:float;

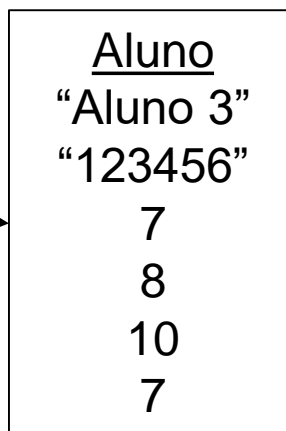
p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();

a1
m = 8



Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

t2:float;

p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();

a1
m = 8

b = false

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String RA;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public void setT2(float t2) {
        this.t2 = t2;
    }
    .....
```

t2 = 8

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public void setT2(float t2) {
        this.t2 = t2;
    }
    .....
```

t2 = 8

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
}
```

(media() >=5)

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

(7+8+10+7)/4.0

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

(media() >=5)

```
.....  
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

(32)/4.0

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

(media() >=5)

```
.....  
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

8

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

(media() >=5)

```
.....  
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{  
    private String nome;  
    private String ra;  
    private float t1;  
    private float t2;  
    private float p1;  
    private float p2;
```

t2 = 8

.....

```
public void setT2(float t2) {  
    this.t2 = t2;  
}
```

.....

```
public float media() {  
    float media = (t1 + t2 + n1 + n2) / 4.0f;  
    return media;  
}
```

media = 8

```
public boolean aprovado(){  
    if (media() >= 5) {  
        return true;  
    }  
    return false;  
}
```

(media() >=5)

```
.....  
}
```

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public void setT2(float t2) {
        this.t2 = t2;
    }
    .....
```

t2 = 8

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
```

(8 >=5)

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
public class Aluno{
    private String nome;
    private String ra;
    private float t1;
    private float t2;
    private float p1;
    private float p2;
    .....
    public void setT2(float t2) {
        this.t2 = t2;
    }
    .....
```

t2 = 8

```
public float media() {
    float media = (t1 + t2 + n1 + n2) / 4.0f;
    return media;
}

public boolean aprovado(){
    if (media() >= 5) {
        return true;
    }
    return false;
}
.....
```

(true)

Aluno
"Aluno 3"
"123456"
7
8
10
7

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

t2:float;

p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();

a1

m = 8

b = false

Aluno

"Aluno 3"

"123456"

7

8

10

7

Exemplos Desenvolvidos

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);  
a1.setT2(8);  
a1.setN1(10);  
a1.setN2(7);  
float m = a1.calcularMedia();  
boolean b = a1.aprovado();
```

Aluno

nome:String;

RA:String;

t1:float;

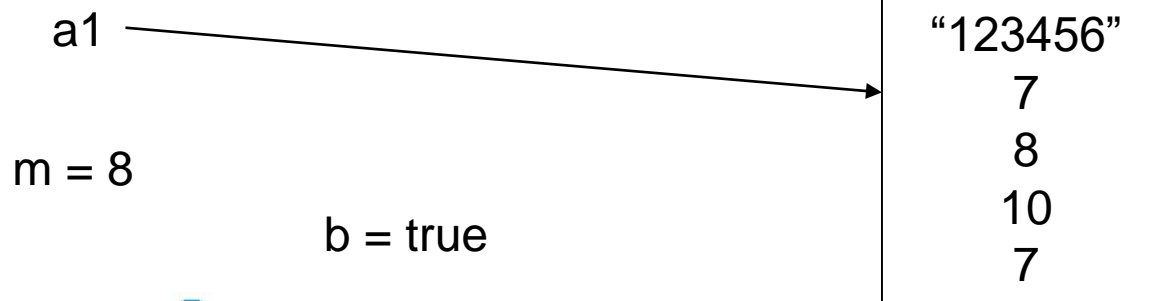
t2:float;

p1:float;

p2:float;

float calcularMedia();

Boolean aprovado();



Exemplos Desenvolvidos

- As instanciações estavam fixas no código e eram limitadas
- Se precisarmos fazer um cadastro conforme a necessidade do usuário?
 - Teremos que usar vetores para armazenar os objetos

Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

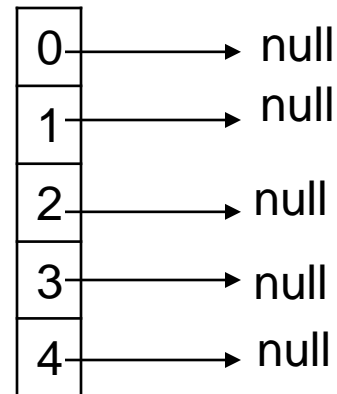
vetor \longrightarrow null

Vetor de Objetos

```
Aluno vetor[];
```

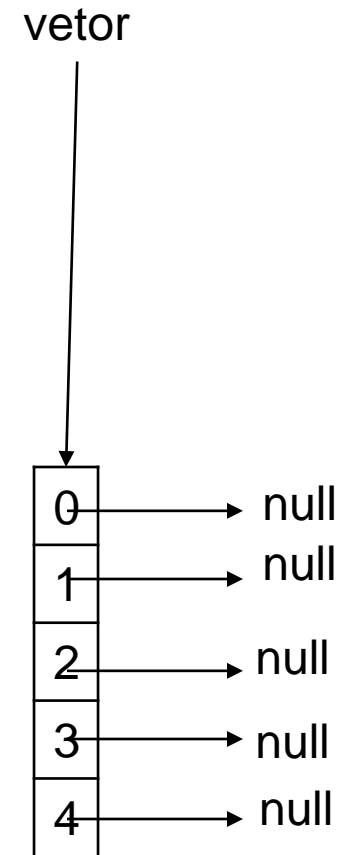
```
vetor = new Aluno[5];
```

vetor → null



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0].setT1(9);
```

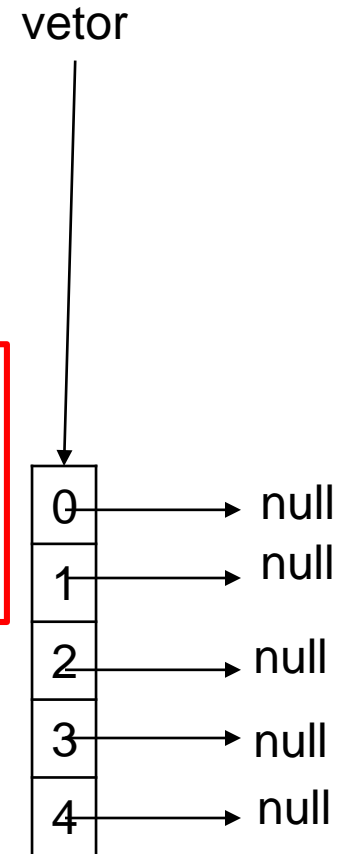


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0].setT1(9);
```

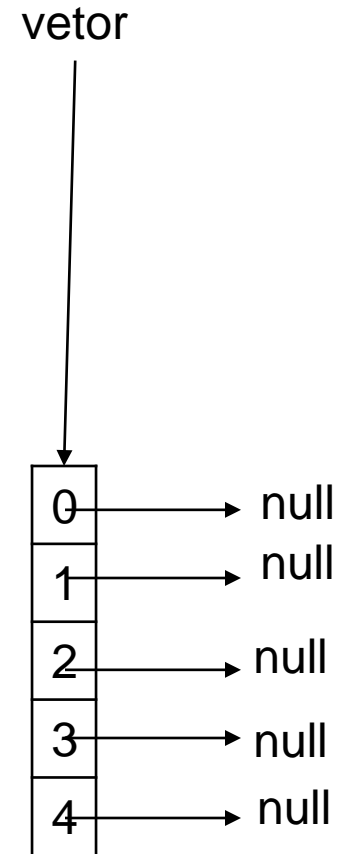
```
Exception in thread "main" java.lang.NullPointerException  
    at exer01.ExemploAula04.main(ExemploAula04.java:15)
```

```
.....  
BUILD FAILED (total time: 0 seconds)
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);
```

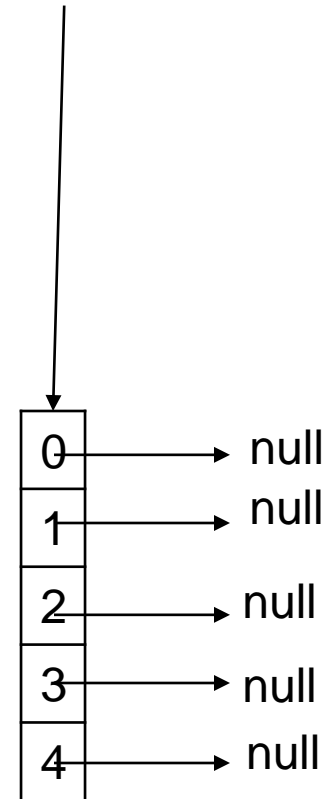
Exemplo Anterior

```
Aluno a1 = new Aluno("Aluno 3", "123456");  
a1.setT1(7);
```

a1

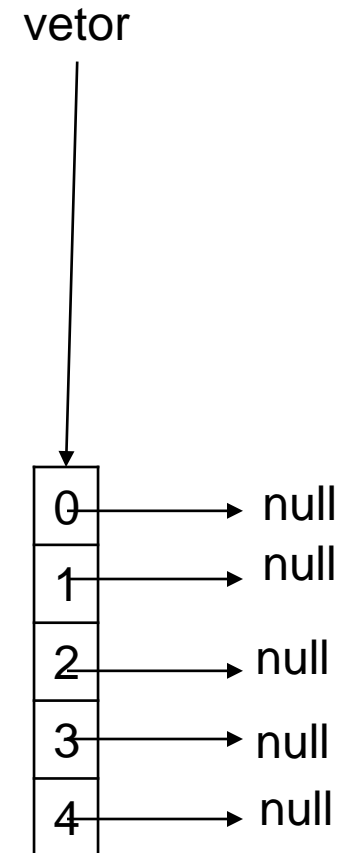
Aluno
"Aluno 3"
"123456"
0
0
0
0

vetor



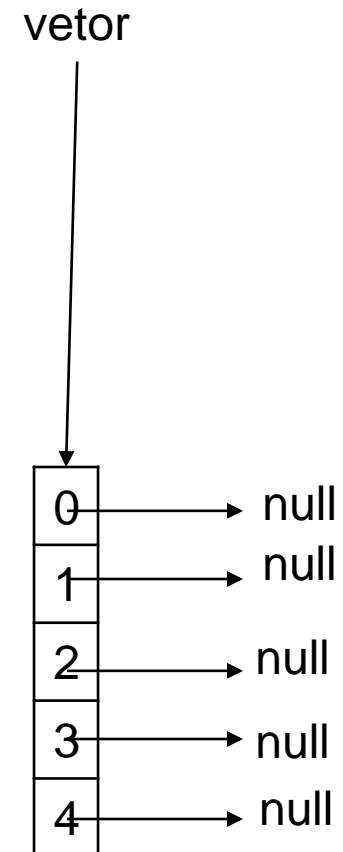
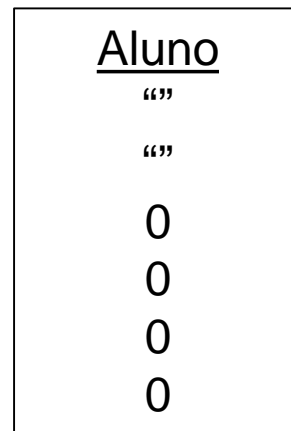
Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);
```



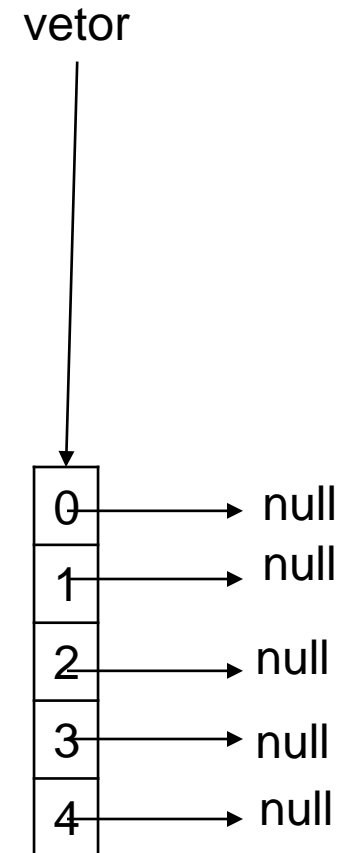
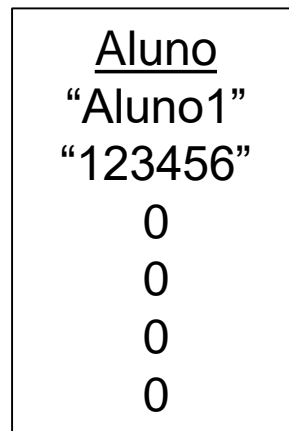
Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);
```



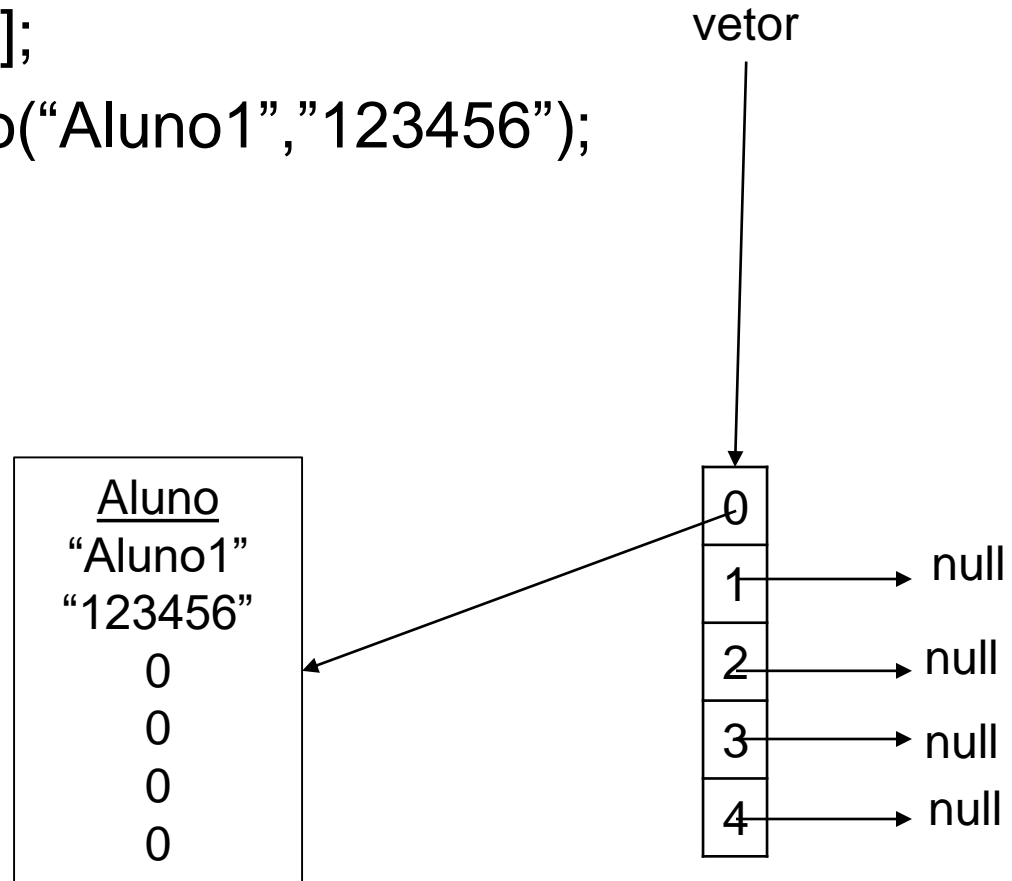
Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

```
vetor[0] = new Aluno("Aluno1", "123456");
```

```
vetor[0].setT1(9);
```



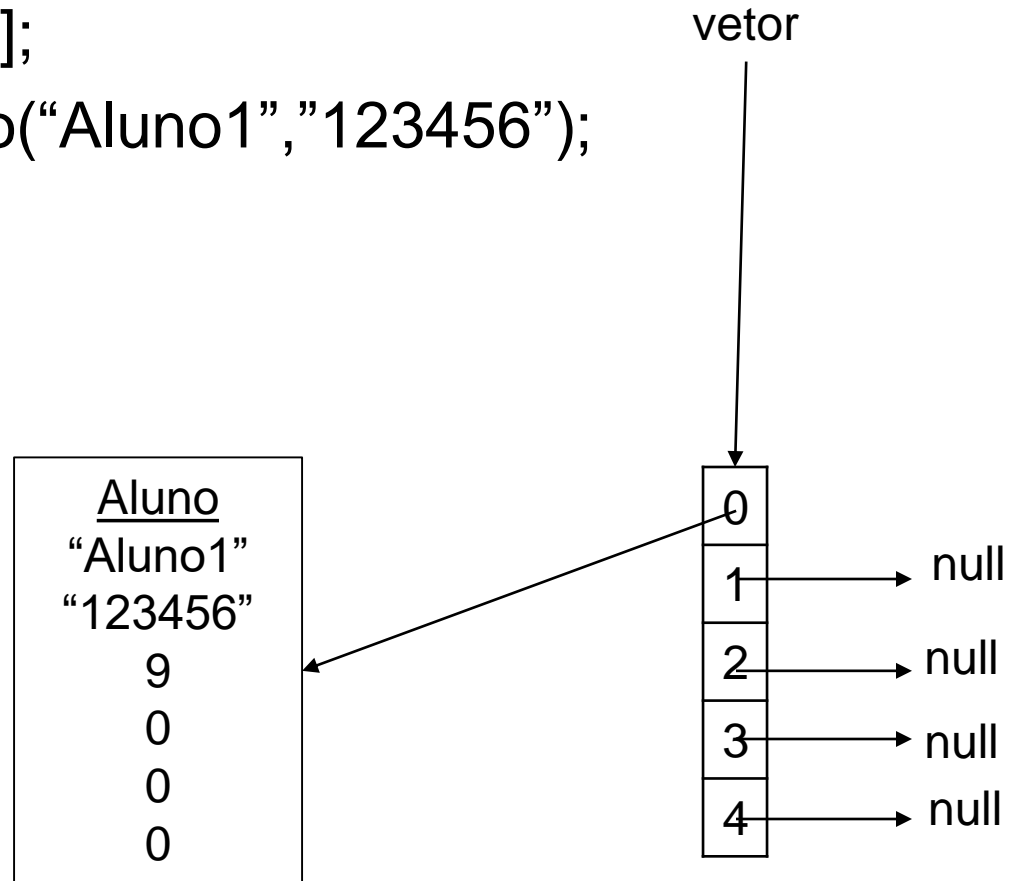
Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

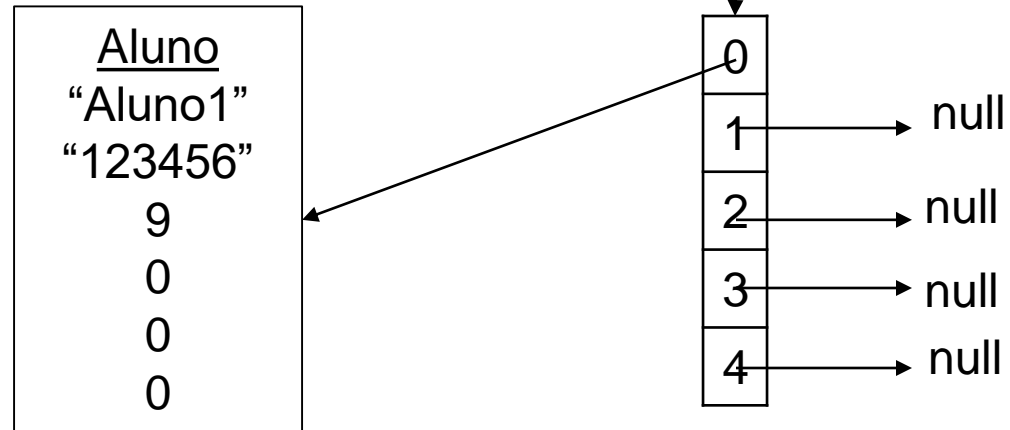
```
vetor[0] = new Aluno("Aluno1", "123456");
```

```
vetor[0].setT1(9);
```



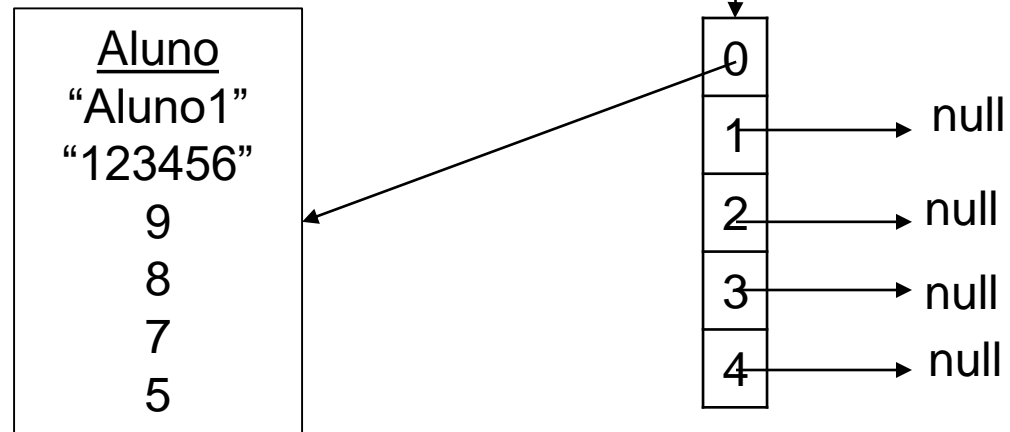
Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);  
vetor[0].setT2(8);  
vetor[0].setN1(7);  
vetor[0].setT2(5);
```



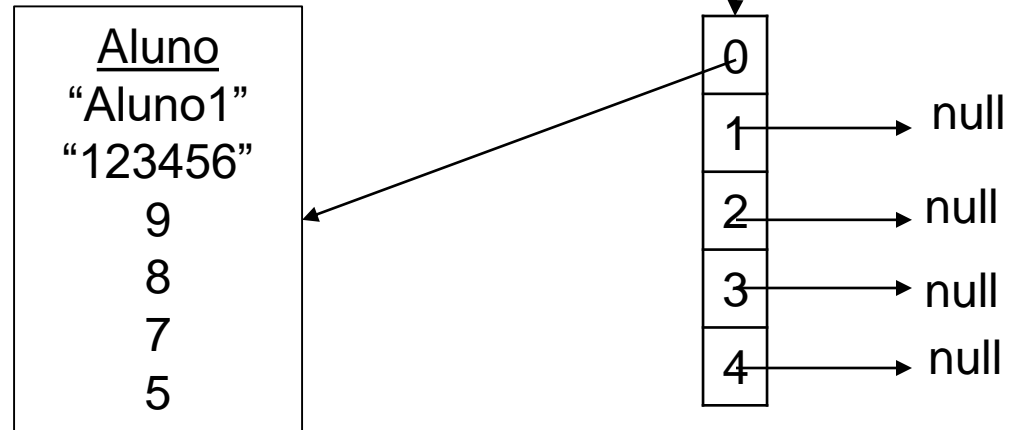
Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);  
vetor[0].setT2(8);  
vetor[0].setN1(7);  
vetor[0].setT2(5);
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[0].setT1(9);  
vetor[0].setT2(8);  
vetor[0].setN1(7);  
vetor[0].setT2(5);  
vetor[0].media();  
vetor[0].aprovado();
```

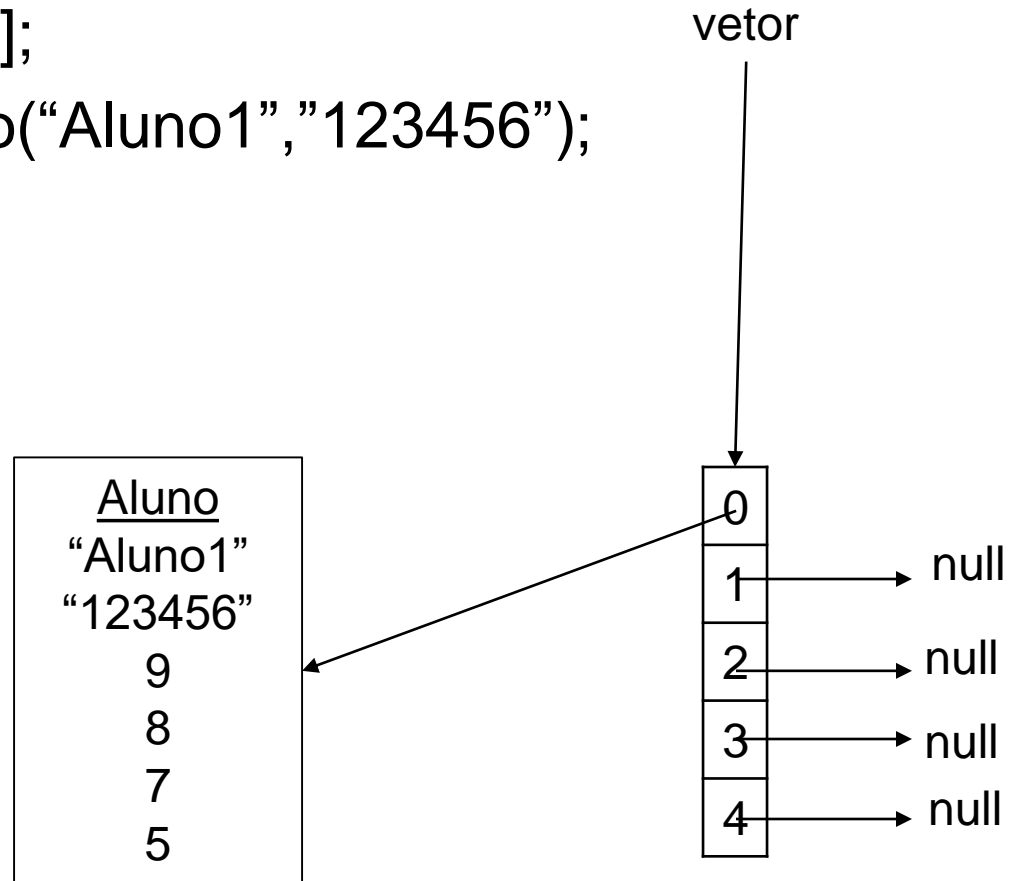


Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

```
vetor[0] = new Aluno("Aluno1", "123456");
```



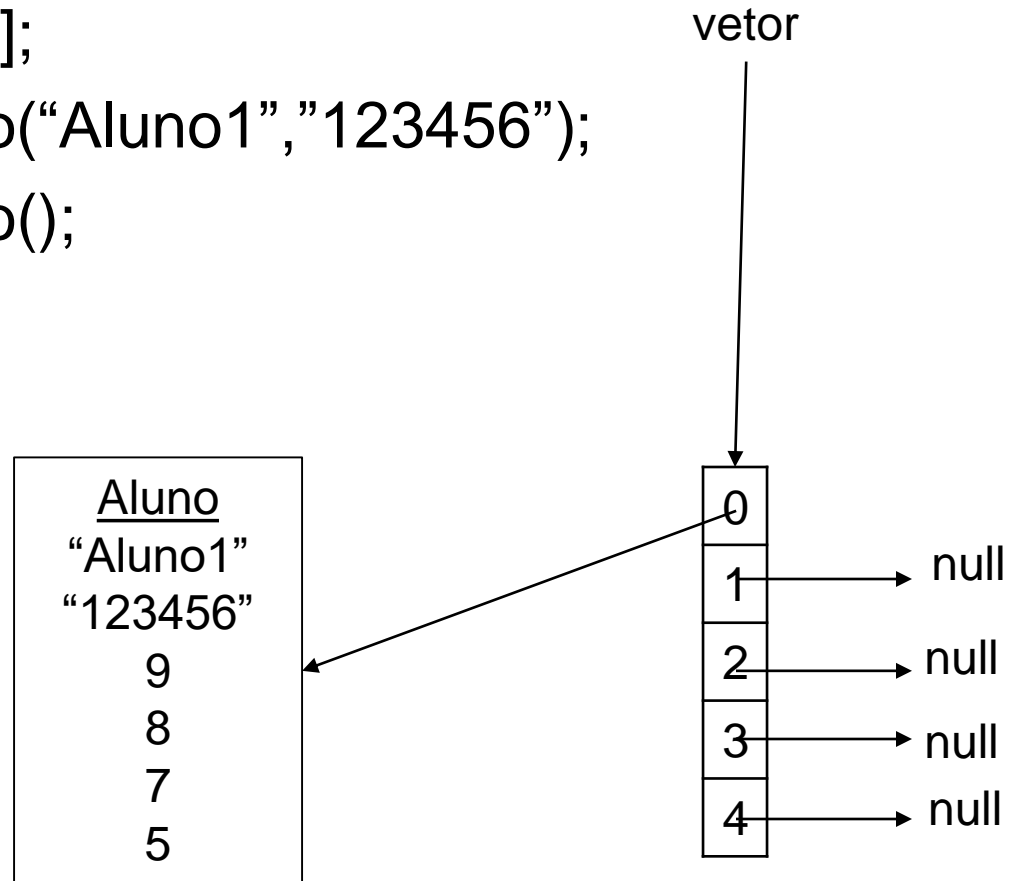
Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

```
vetor[0] = new Aluno("Aluno1", "123456");
```

```
vetor[1] = new Aluno();
```



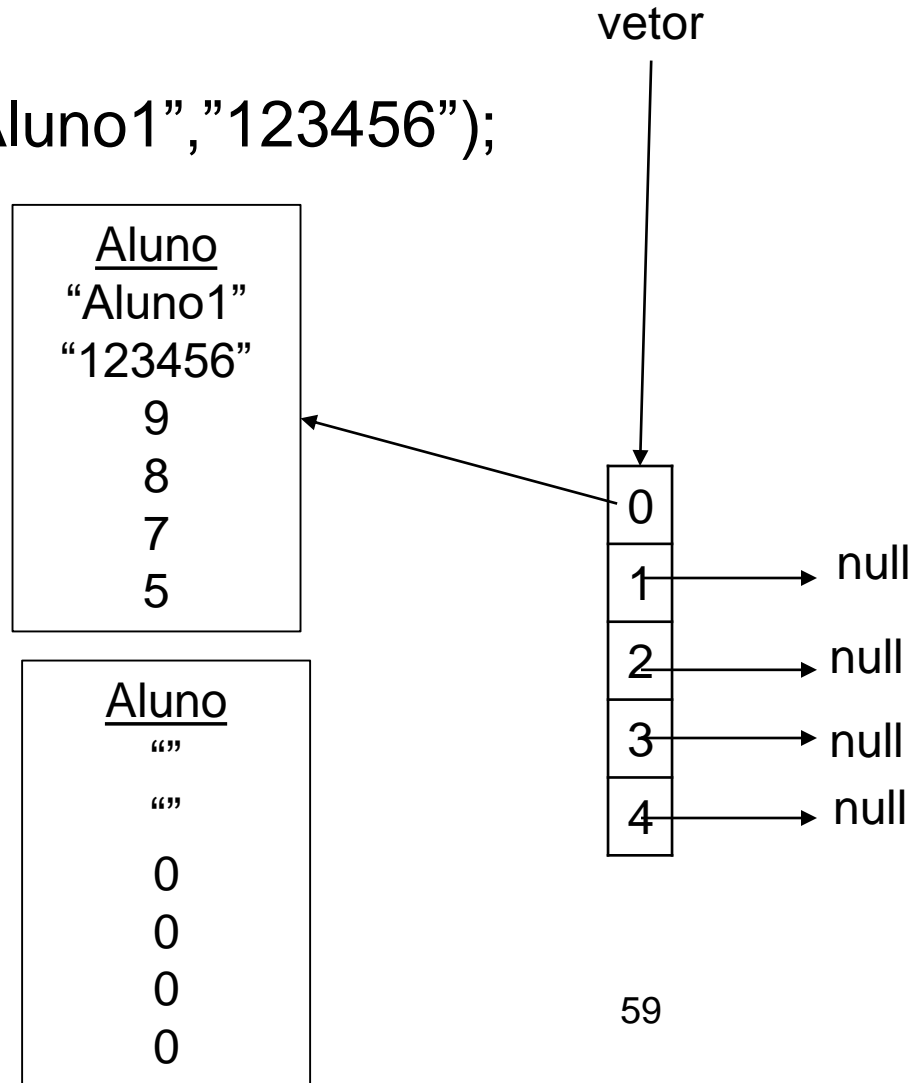
Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

```
vetor[0] = new Aluno("Aluno1", "123456");
```

```
vetor[1] = new Aluno();
```



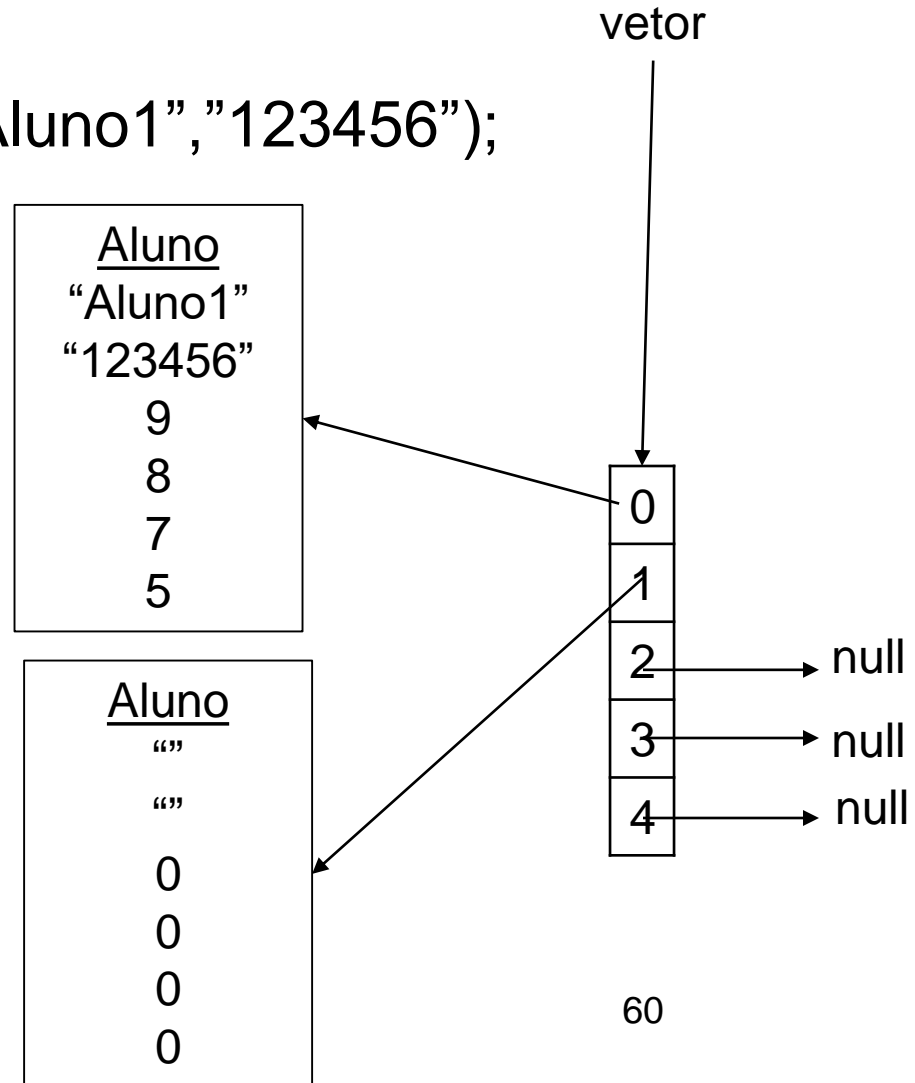
Vetor de Objetos

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

```
vetor[0] = new Aluno("Aluno1", "123456");
```

```
vetor[1] = new Aluno();
```



Vetor de Objetos

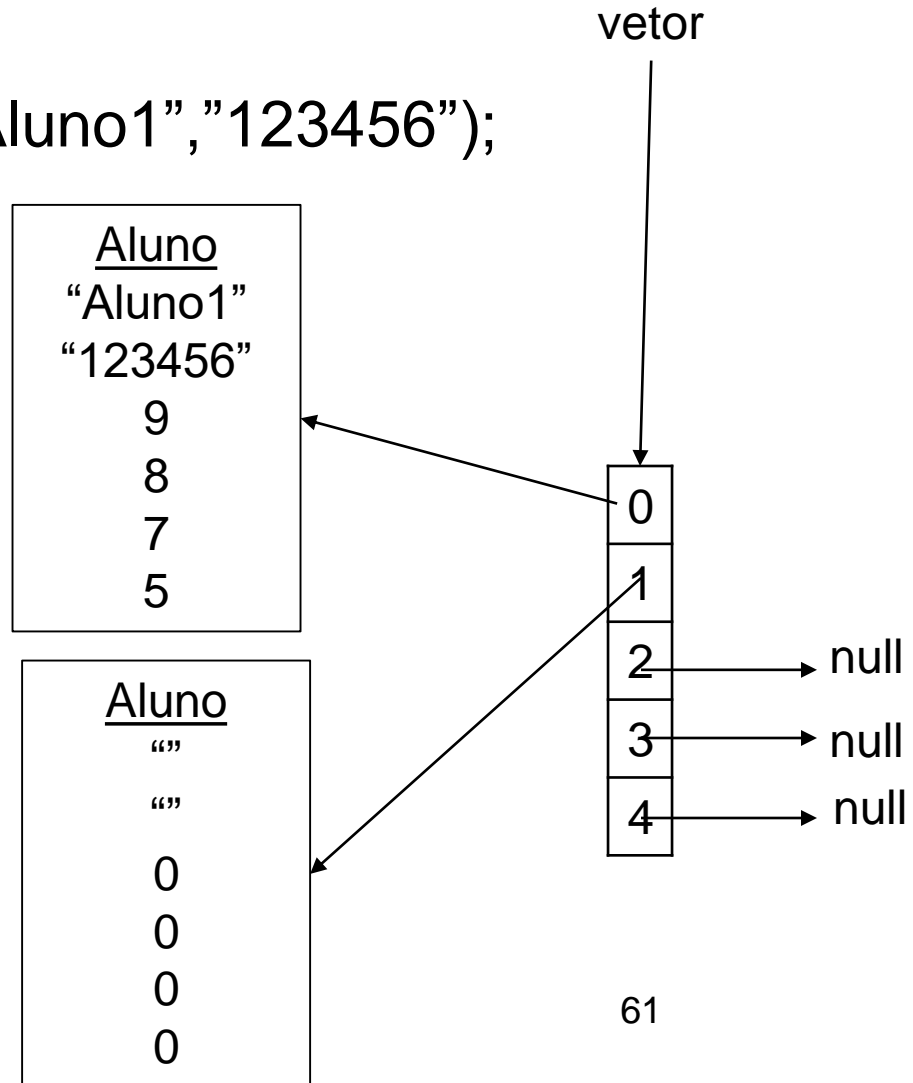
```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

```
vetor[0] = new Aluno("Aluno1", "123456");
```

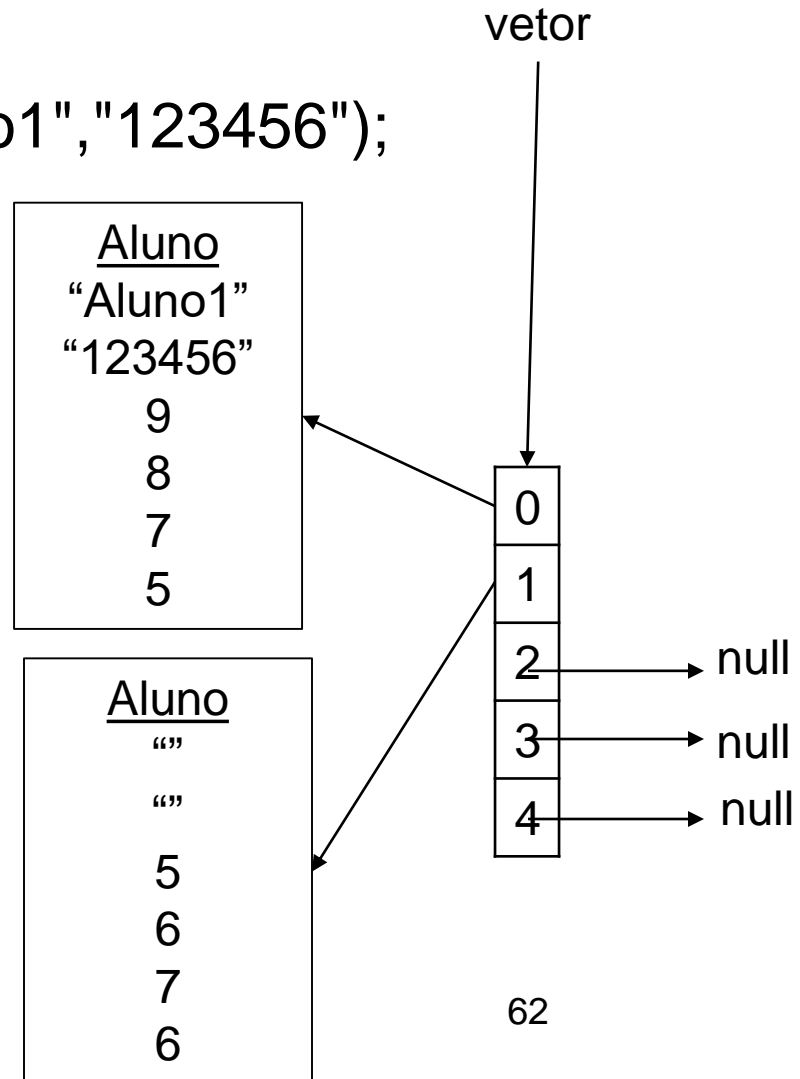
```
vetor[1] = new Aluno();
```

Como acessar os objetos?



Vetor de Objetos

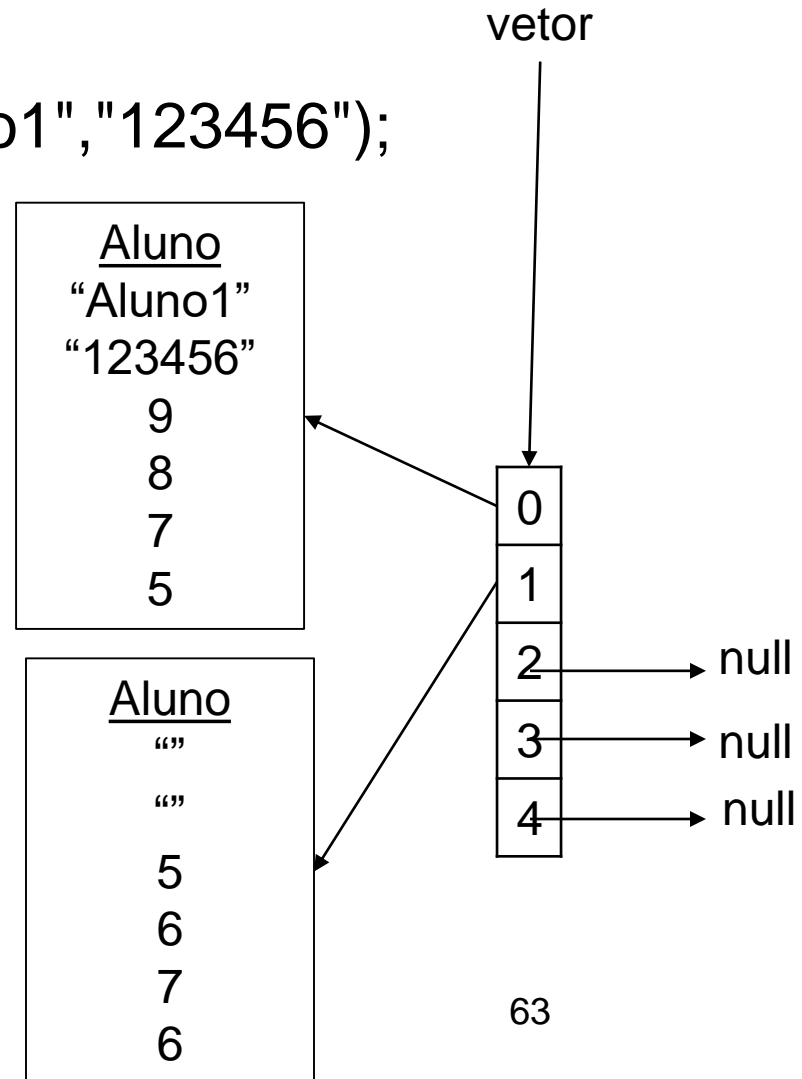
```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

```
s = 0  
i = 0
```

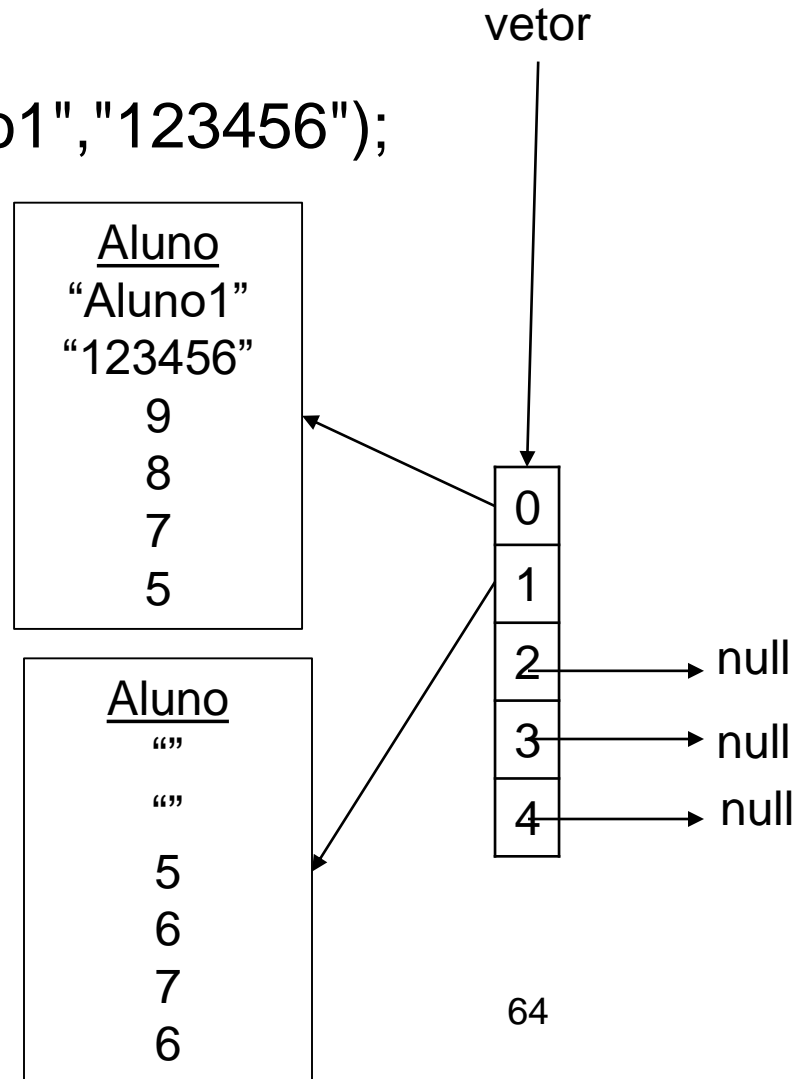


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

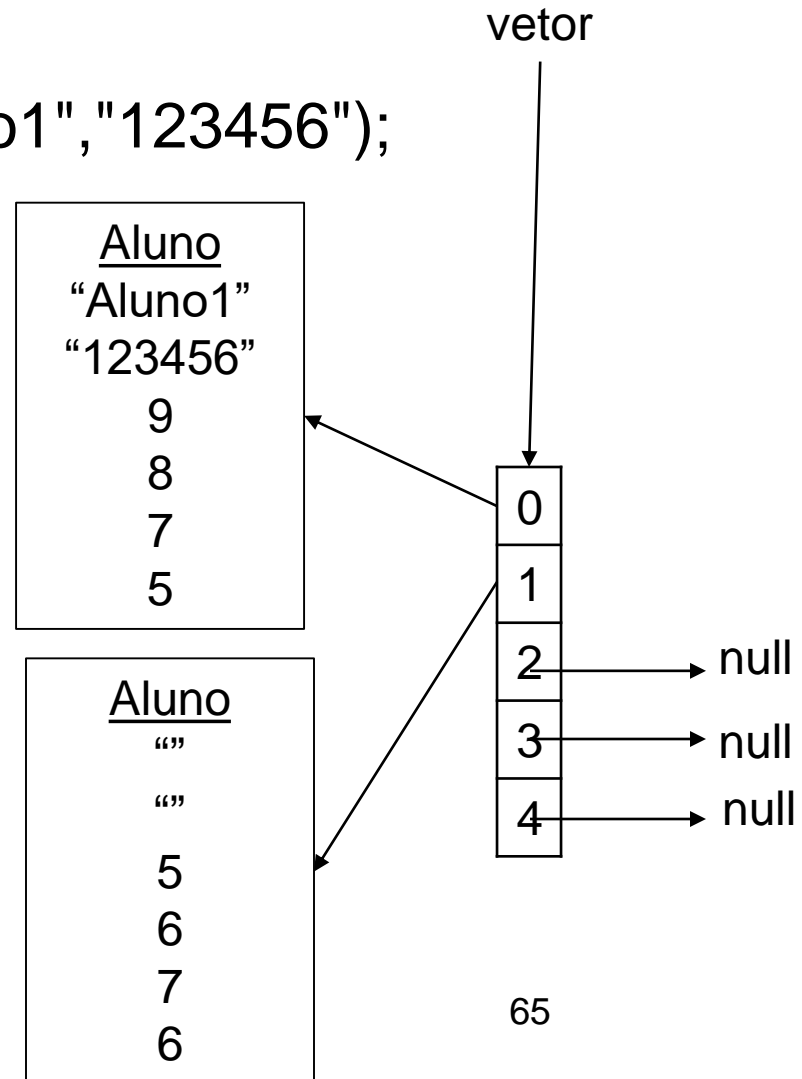
0 + 7.25
s = 0
i = 0



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

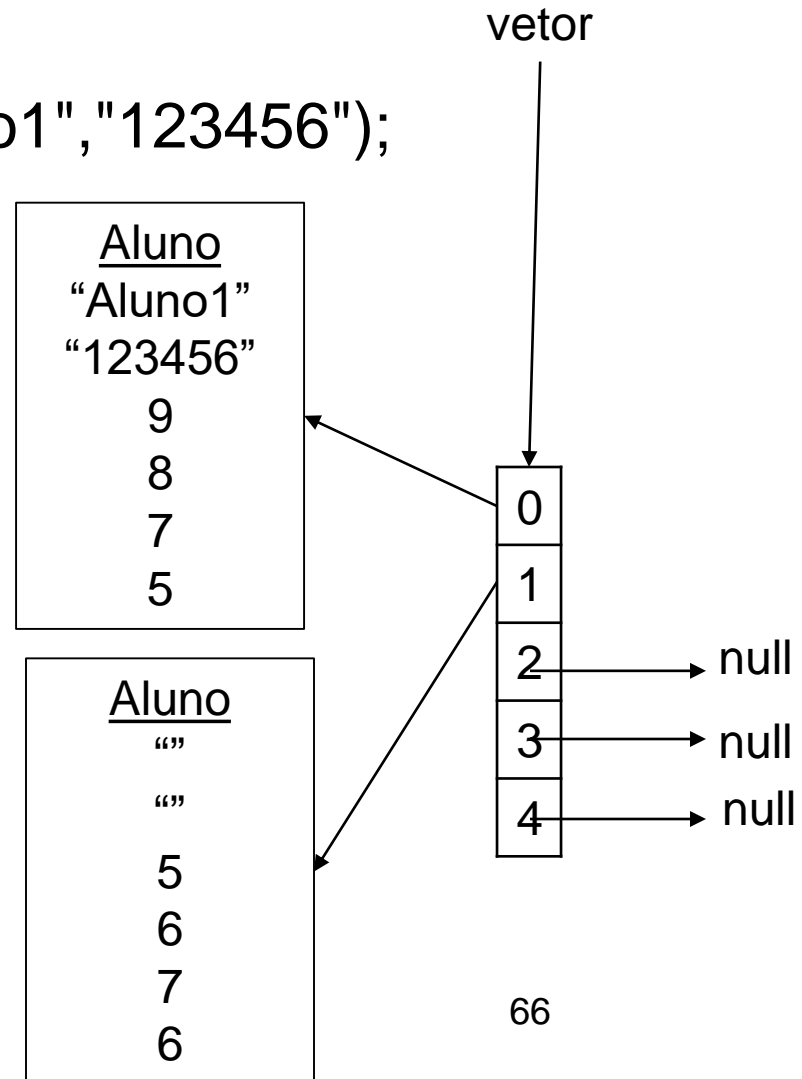
s = 7.25
i = 0



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

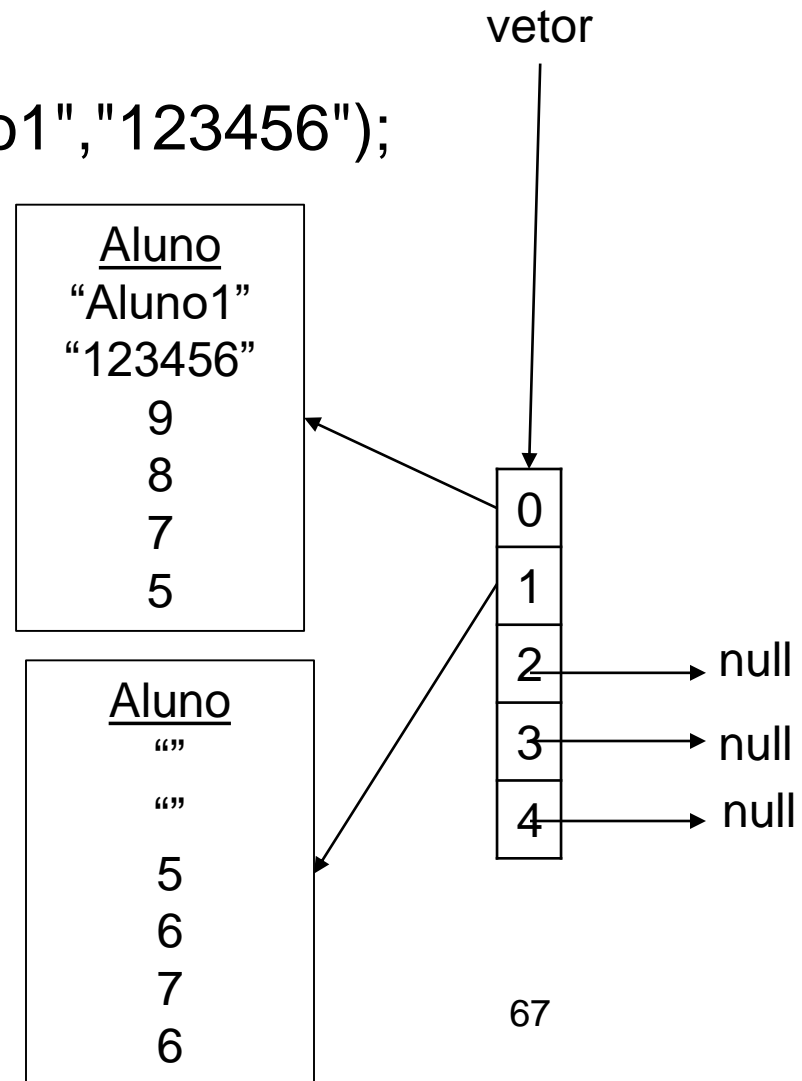
s = 7.25
i = 1



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

s = 7.25
i = 1

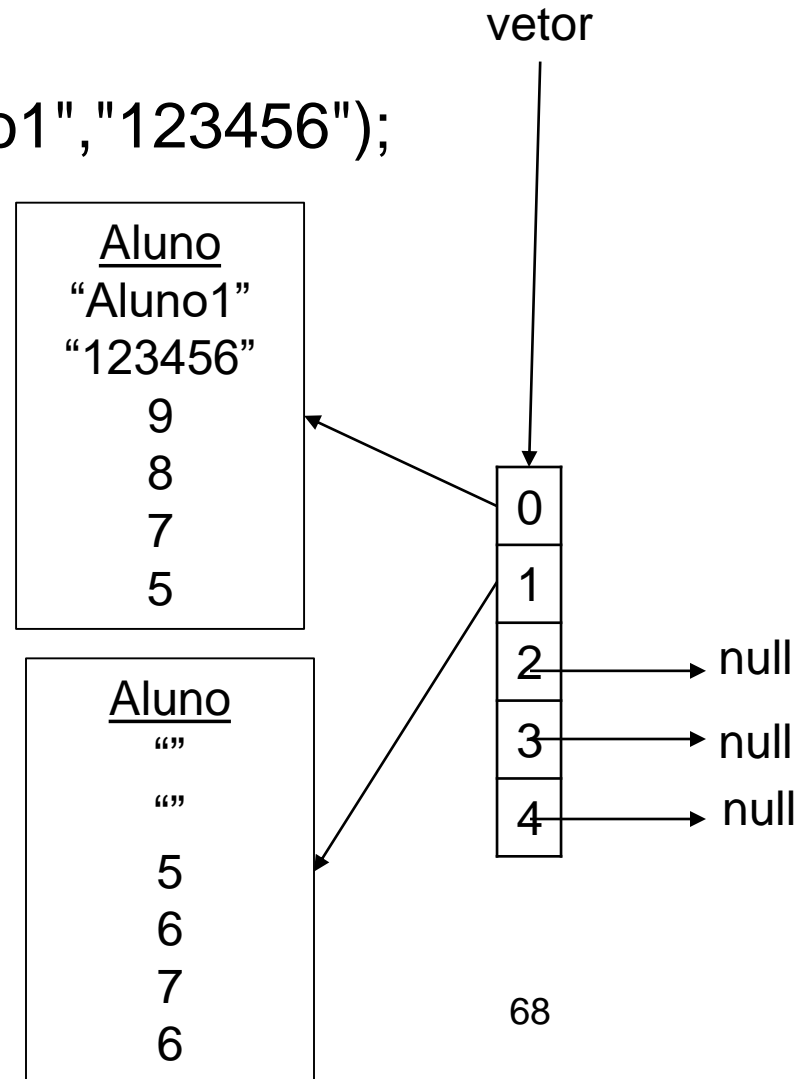


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

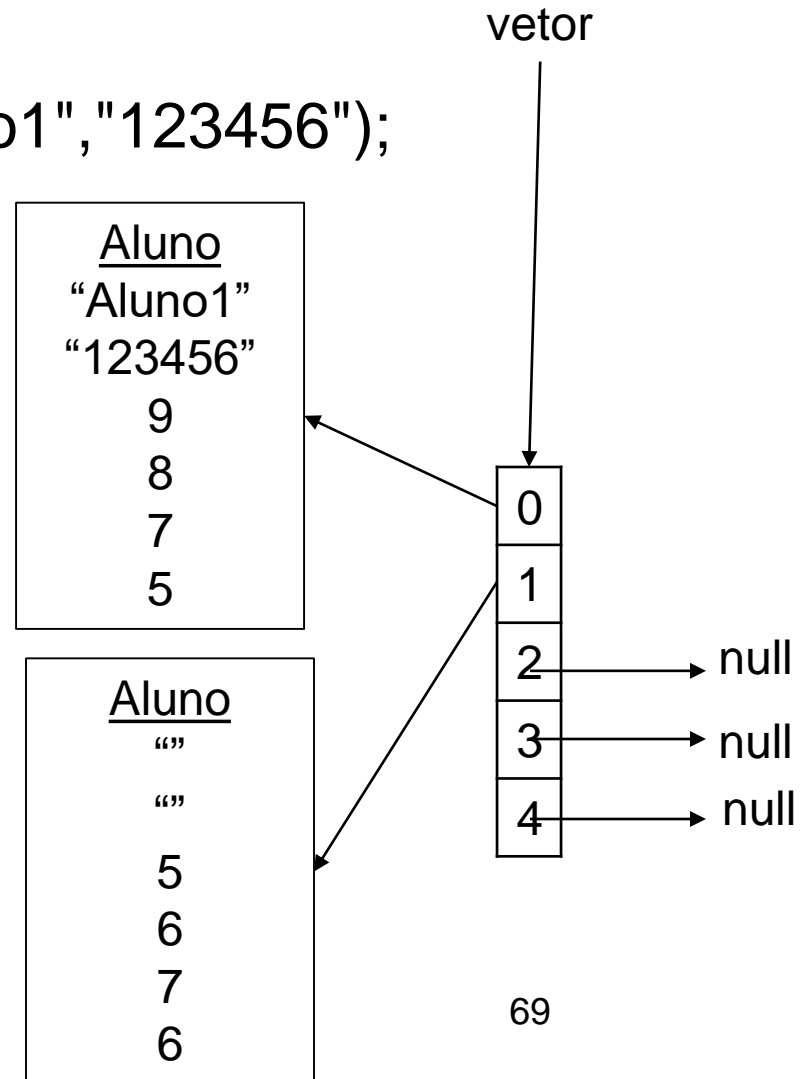
```
13.25  
s = 13.25  
i = 1
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

s = 13.25
i = 2

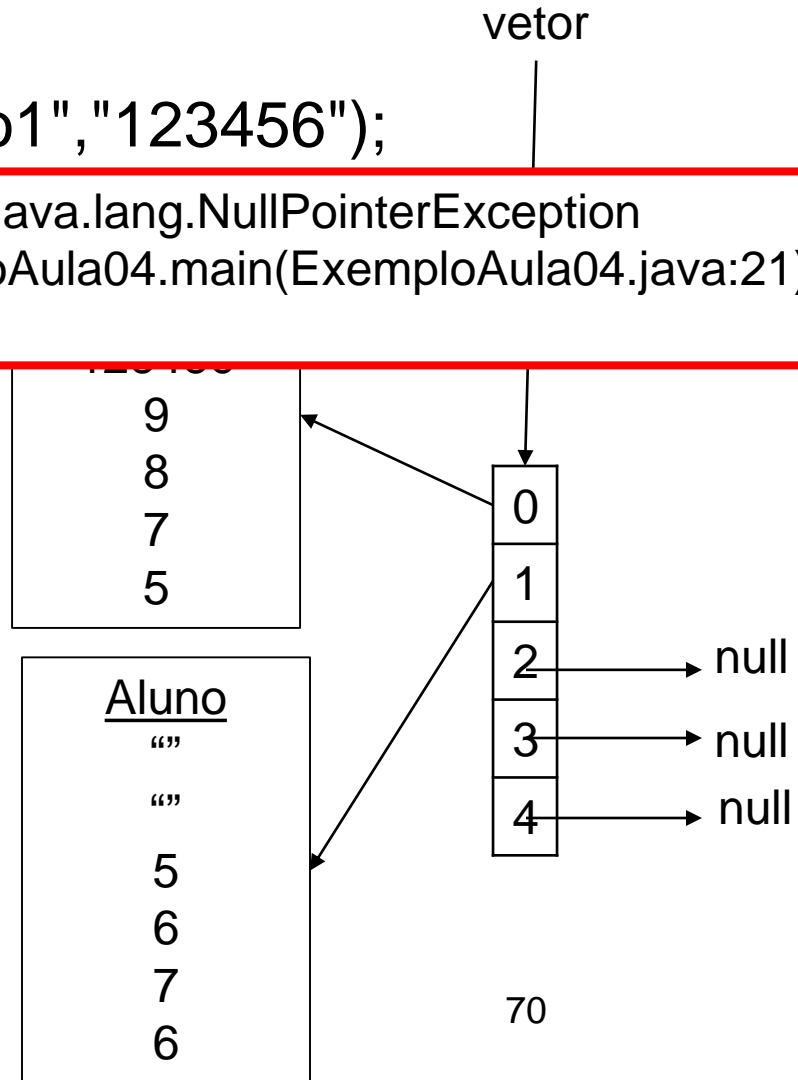


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno("Aluno2", "123456");  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    s = s + vetor[i].media();  
}
```

Exception in thread "main" java.lang.NullPointerException
at exer01.ExemploAula04.main(ExemploAula04.java:21)

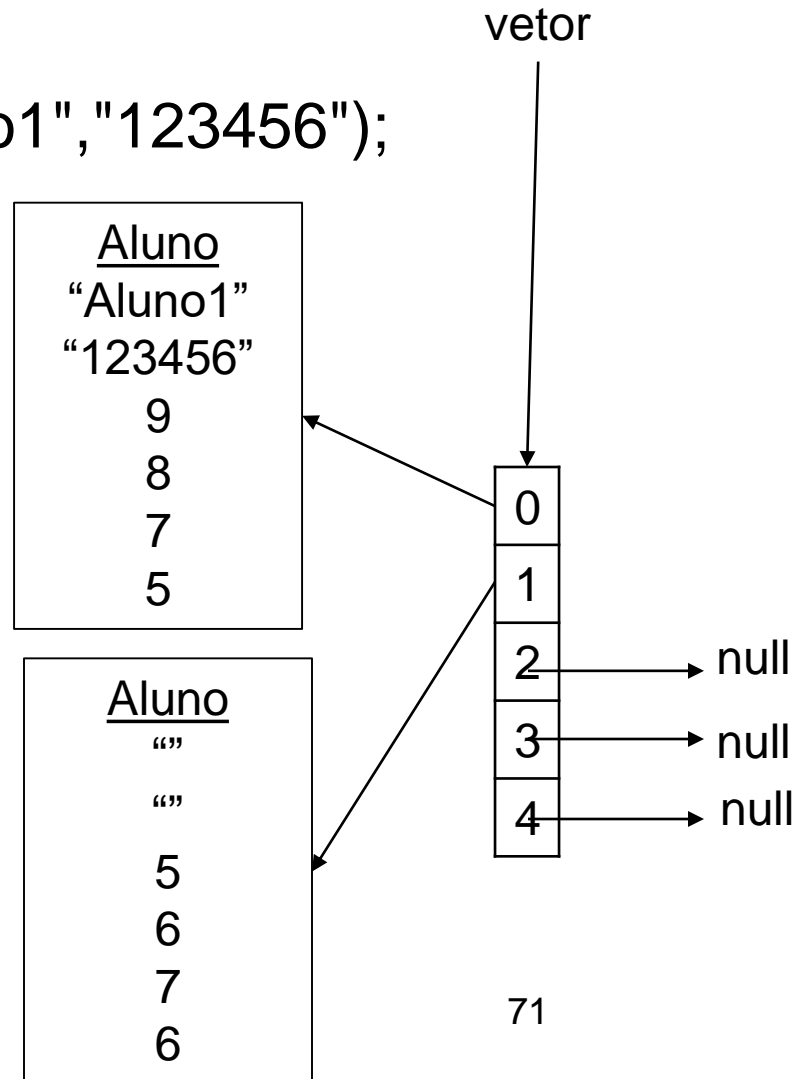
s = 13.25
i = 2



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

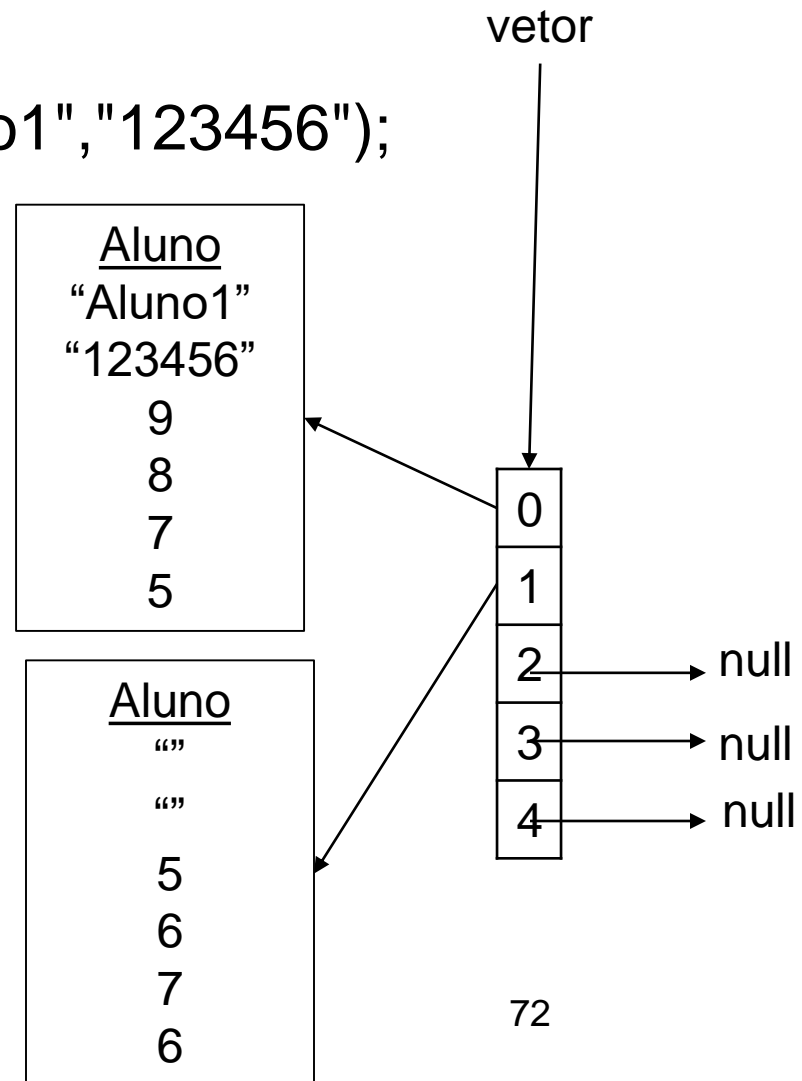
```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 13.25  
      i = 2
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

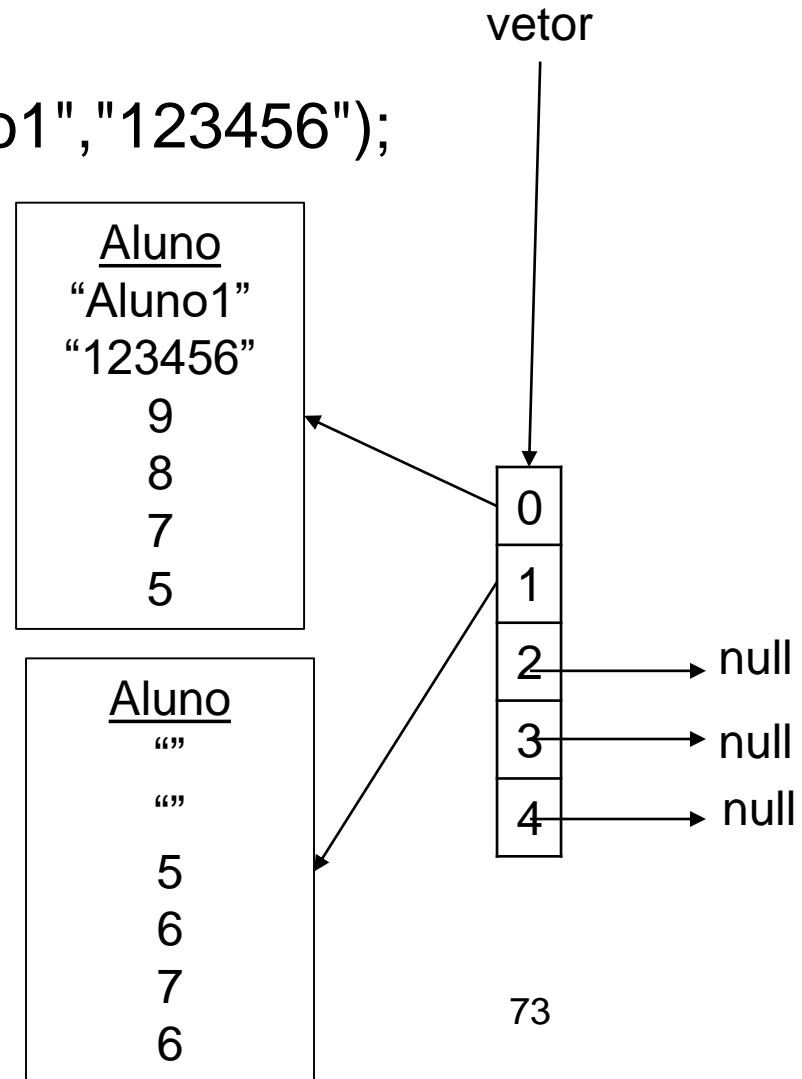
```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 0  
      i = 0
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

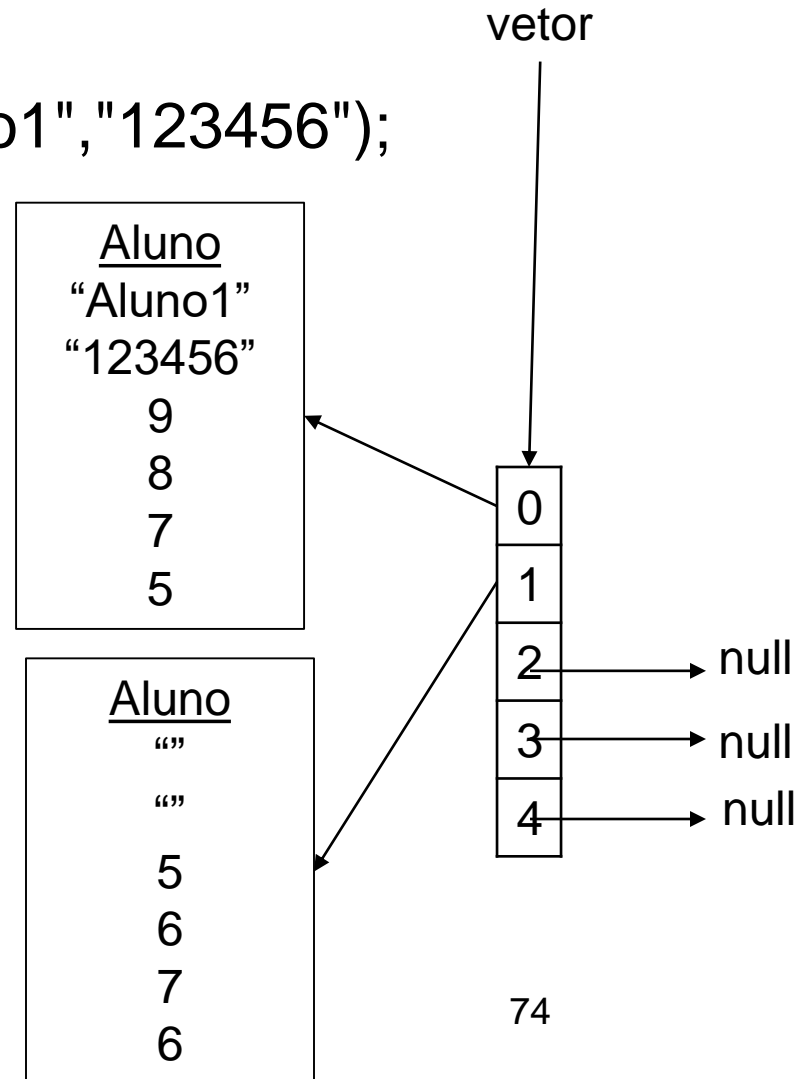
```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 7.25  
      i = 0
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

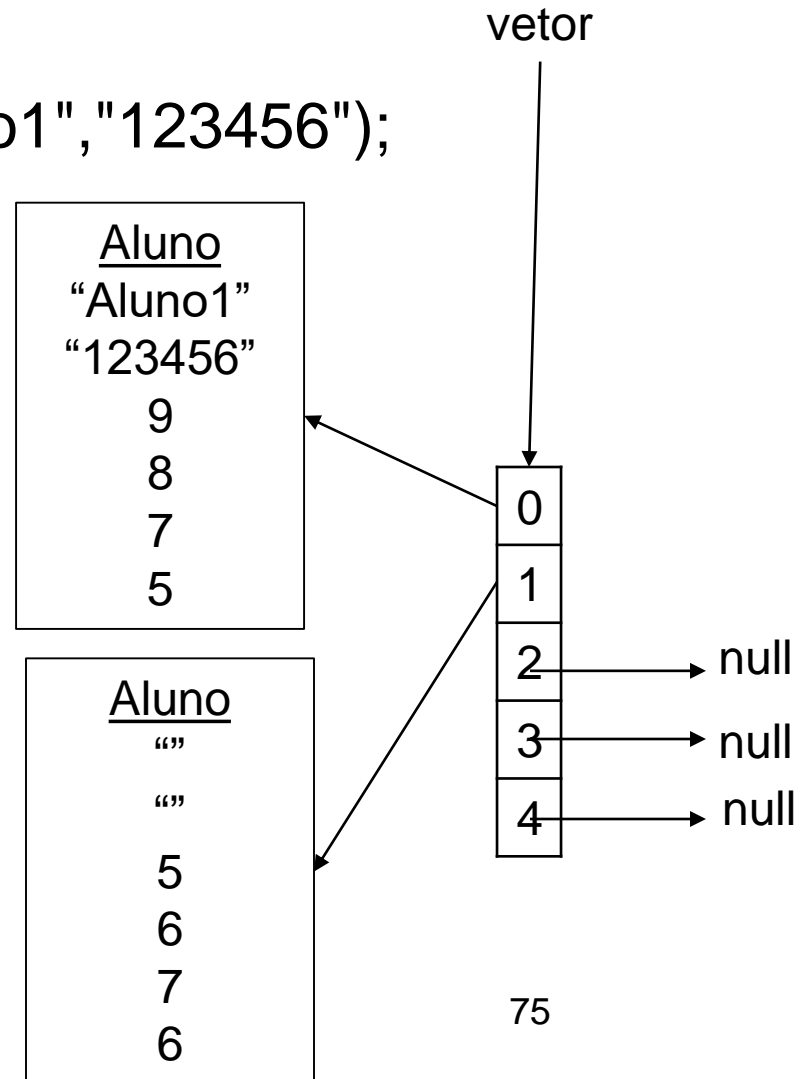
```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 7.25  
      i = 1
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

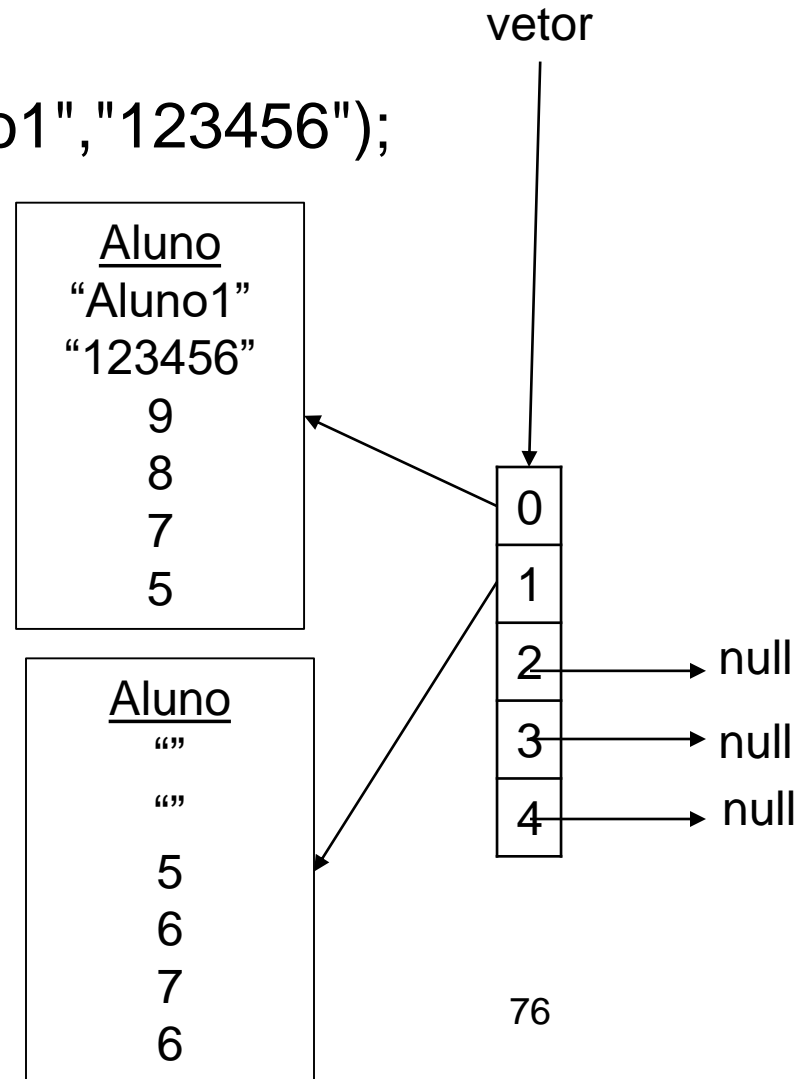
```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 13.25  
      i = 1
```



Vetor de Objetos

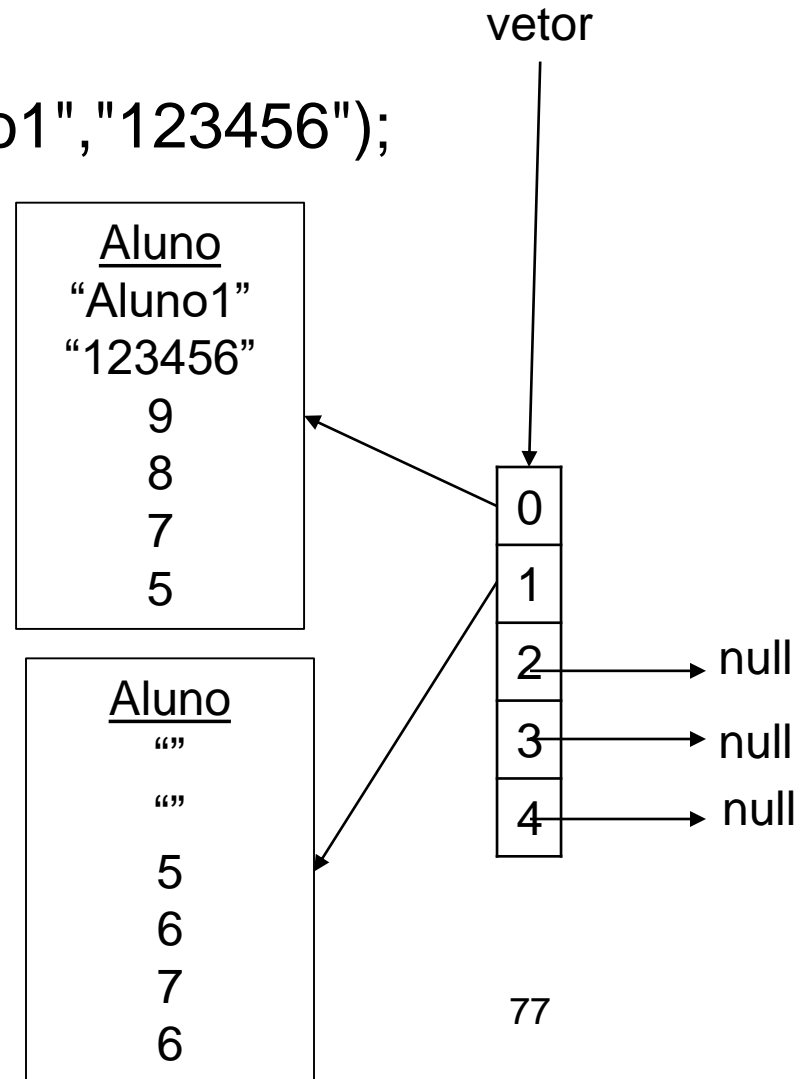
```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 13.25  
      i = 2
```



Vetor de Objetos

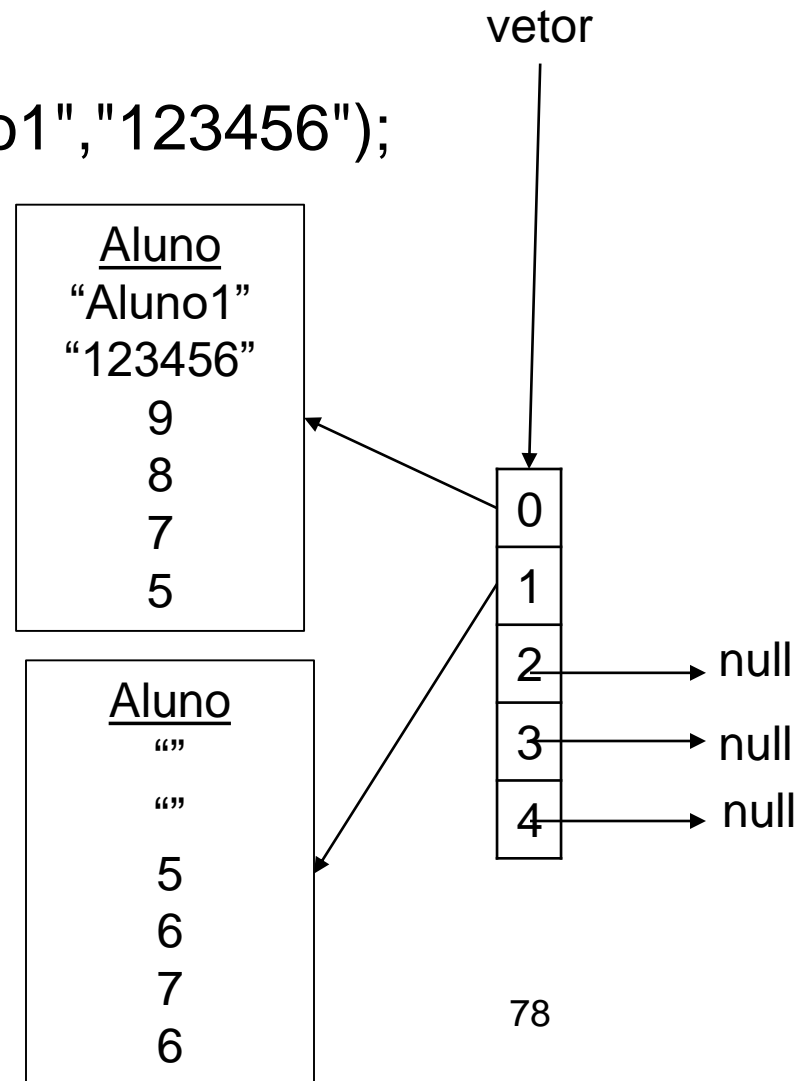
```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 13.25  
      i = 3
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

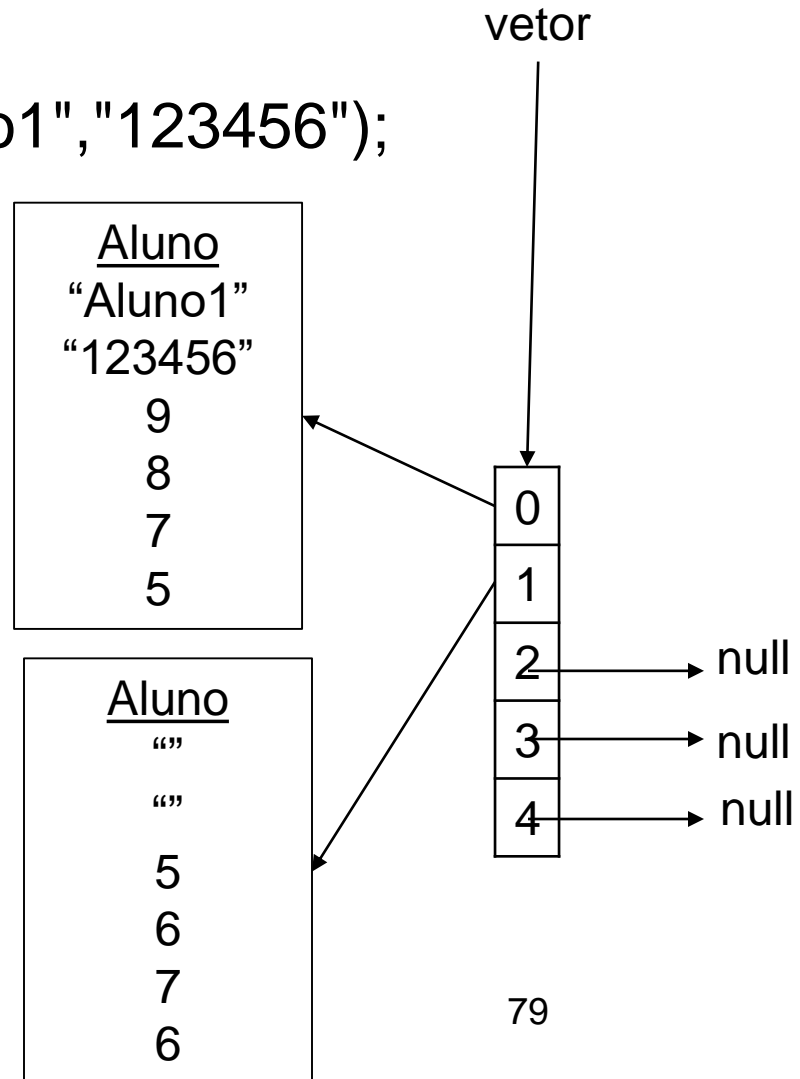
```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 13.25  
      i = 4
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

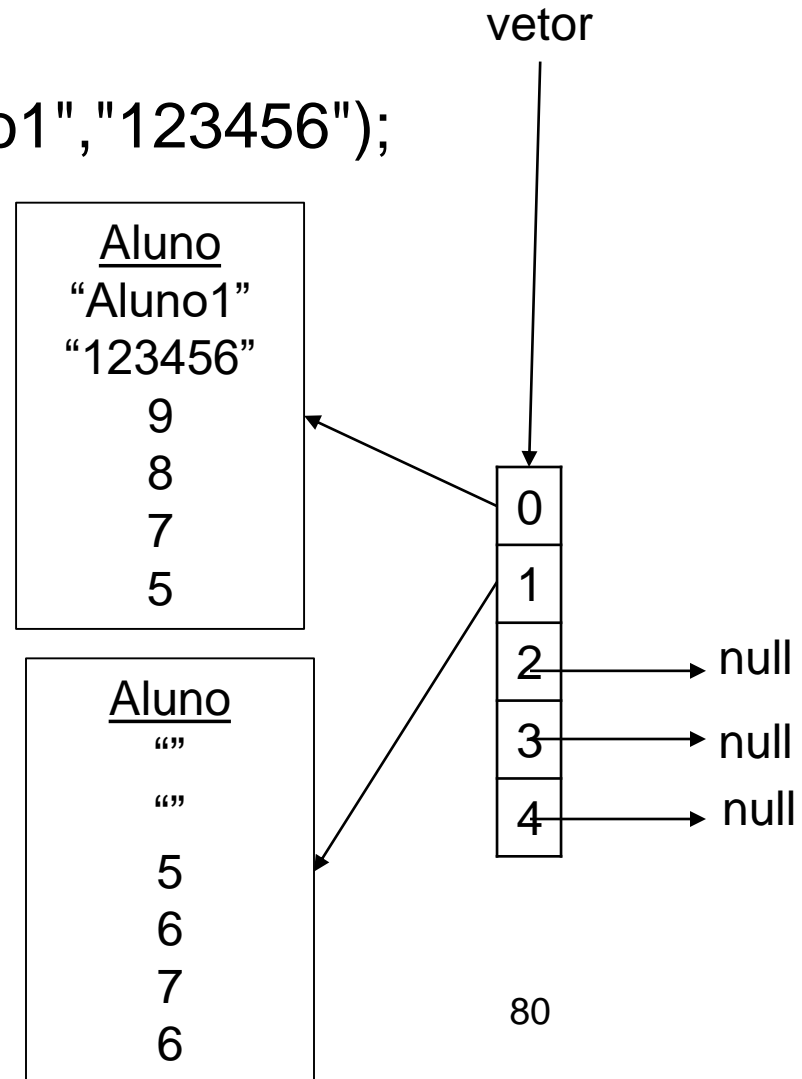
```
float s = 0;  
for (int i = 0; i < 5; i++) {  
    if (vetor[i] != null){  
        s = s + vetor[i].media();  
    }  
}      s = 13.25  
      i = 5
```



Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....  
float s = 0;  
for (int i = 0; i < 2; i++) {  
    s = s + vetor[i].media();  
}
```

```
s = 0  
i = 0
```

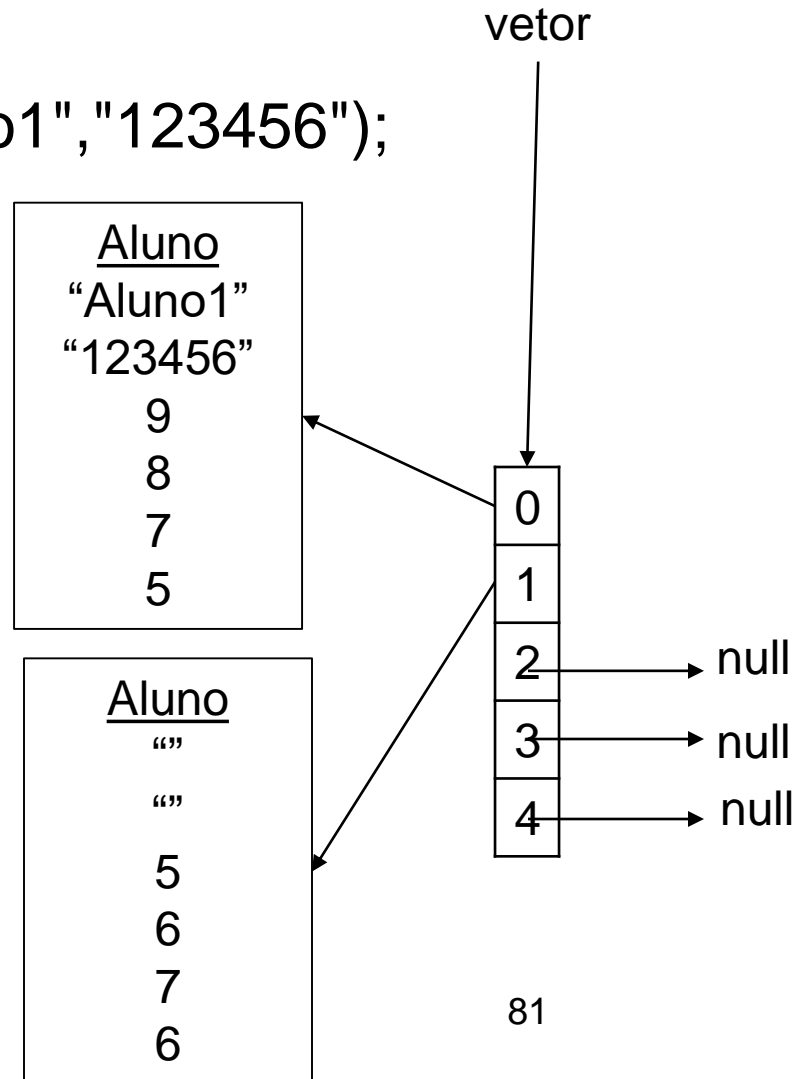


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
int cont = 2;  
for (int i = 0; i < cont; i++) {  
    s = s + vetor[i].media();  
}
```

```
s = 0  
i = 0  
cont = 2
```

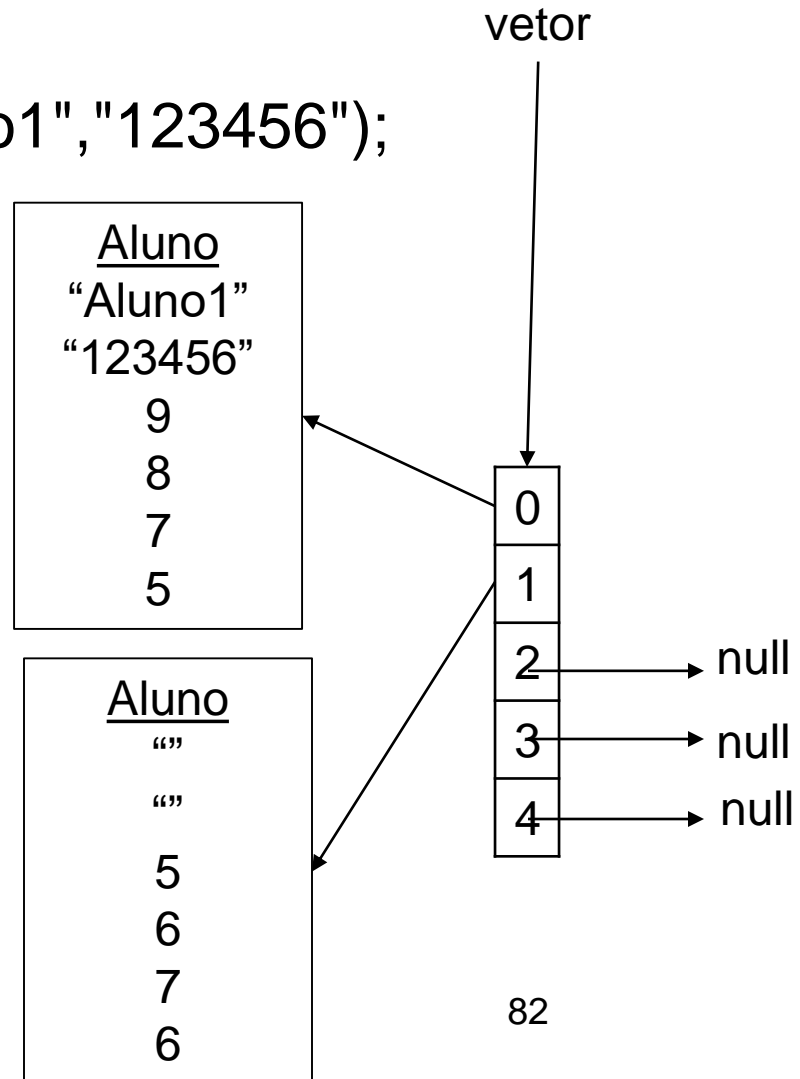


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
int cont = 2;  
for (int i = 0; i < cont; i++) {  
    s = s + vetor[i].media();  
}
```

```
s = 7.25  
i = 0  
cont = 2
```

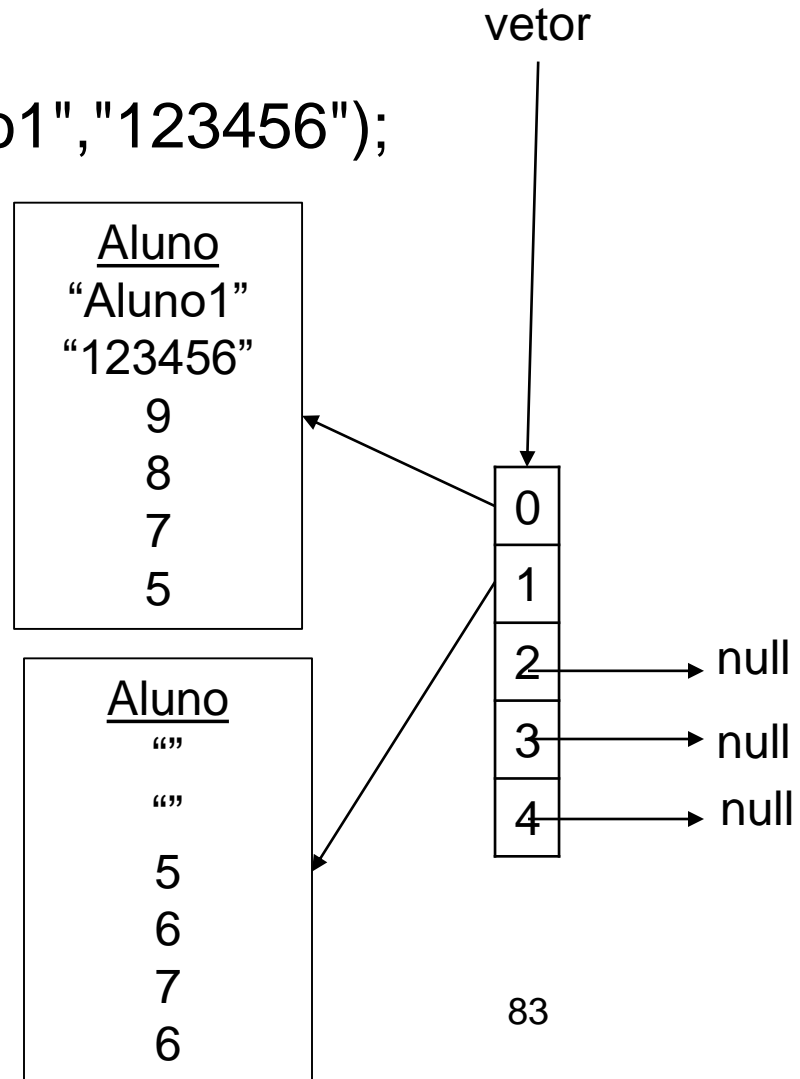


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
int cont = 2;  
for (int i = 0; i < cont; i++) {  
    s = s + vetor[i].media();  
}
```

```
s = 7.25  
i = 1  
cont = 2
```

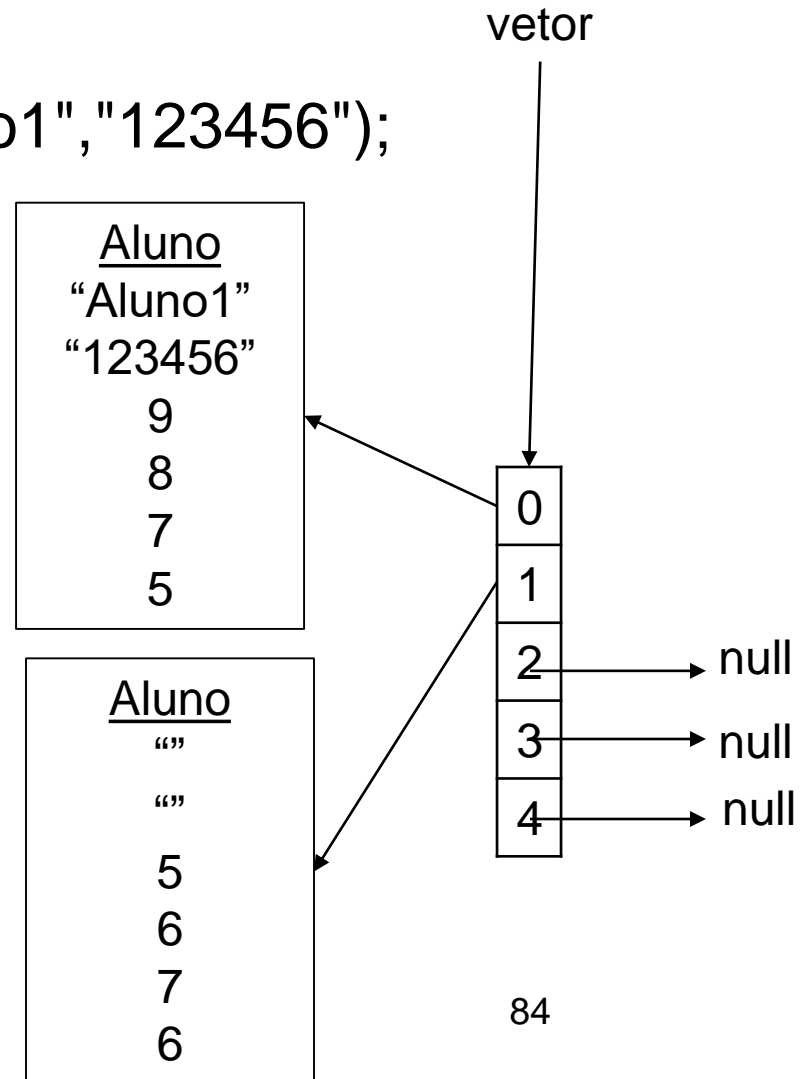


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
int cont = 2;  
for (int i = 0; i < cont; i++) {  
    s = s + vetor[i].media();  
}
```

```
s = 13.25  
i = 1  
cont = 2
```

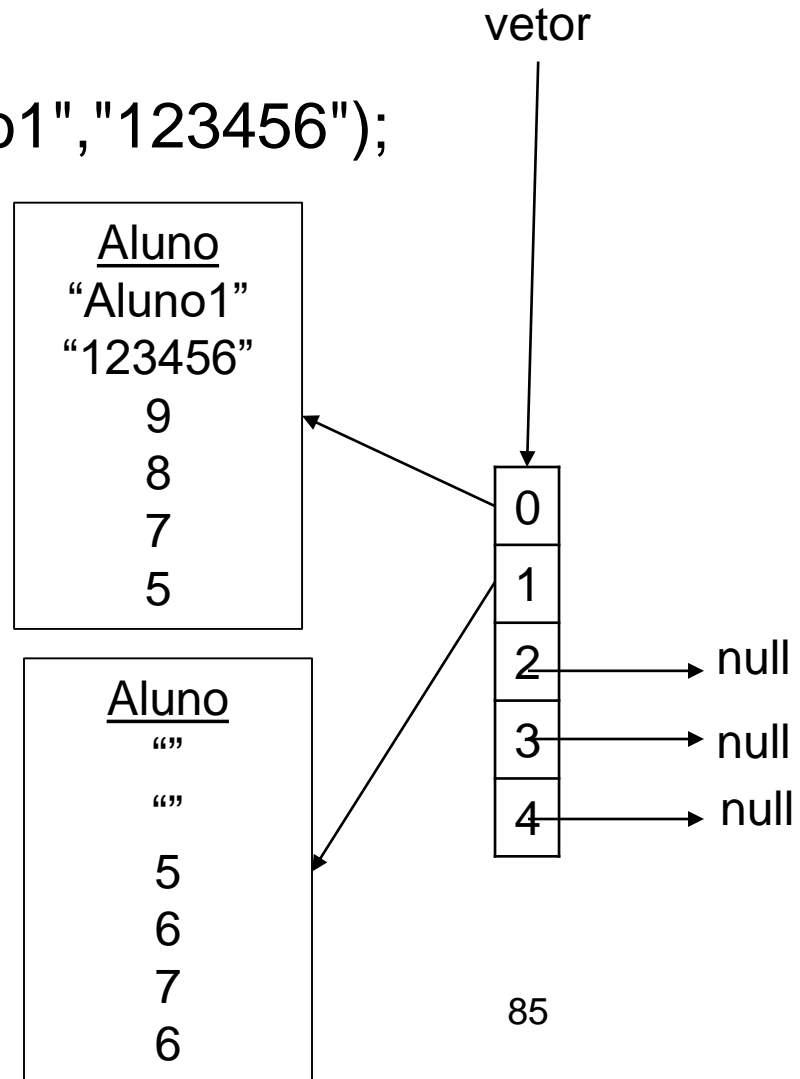


Vetor de Objetos

```
Aluno vetor[];  
vetor = new Aluno[5];  
vetor[0] = new Aluno("Aluno1", "123456");  
vetor[1] = new Aluno();  
.....
```

```
float s = 0;  
int cont = 2;  
for (int i = 0; i < cont; i++) {  
    s = s + vetor[i].media();  
}
```

```
s = 13.25  
i = 2  
cont = 2
```



Vetor de Objetos - Cuidados

- Lembrar de Instanciar o vetor

```
Aluno vetor[];
```

```
vetor = new Aluno[5];
```

ou

```
Aluno vetor[] = new Aluno[5];
```

Vetor de Objetos - Cuidados

- Lembrar de Instanciar os objetos

```
Aluno vetor[] = new Aluno[5];
```

```
vetor[0] = new Aluno();
```

```
vetor[cont] = new Aluno();
```

```
cont++;
```

Vetor de Objetos - Cuidados

- Quando for percorrer um vetor, lembrar de acessar as posições que possuem objetos

```
for(int i=0; i<cont; i++){  
    vetor[i].metodo();  
}
```

```
for(int i=0; i<MAX; i++){  
    if (vetor[i] != null){  
        vetor[i].metodo();  
    }  
}
```


Vetor de Objetos - Cuidados

- Quando for percorrer um vetor, lembrar de acessar as posições que possuem objetos
 - Quando o vetor pode possuir posições sem objetos. Por exemplo, foram excluídos

```
for(int i=0; i<cont; i++){  
    if (vetor[i] != null){  
        vetor[i].metodo();  
    }  
}
```

Exercícios

- Ver os exemplos da parte prática
- Fazer os exercícios da aula

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