



# **Alocação e Gerenciamento de Memória Livre**

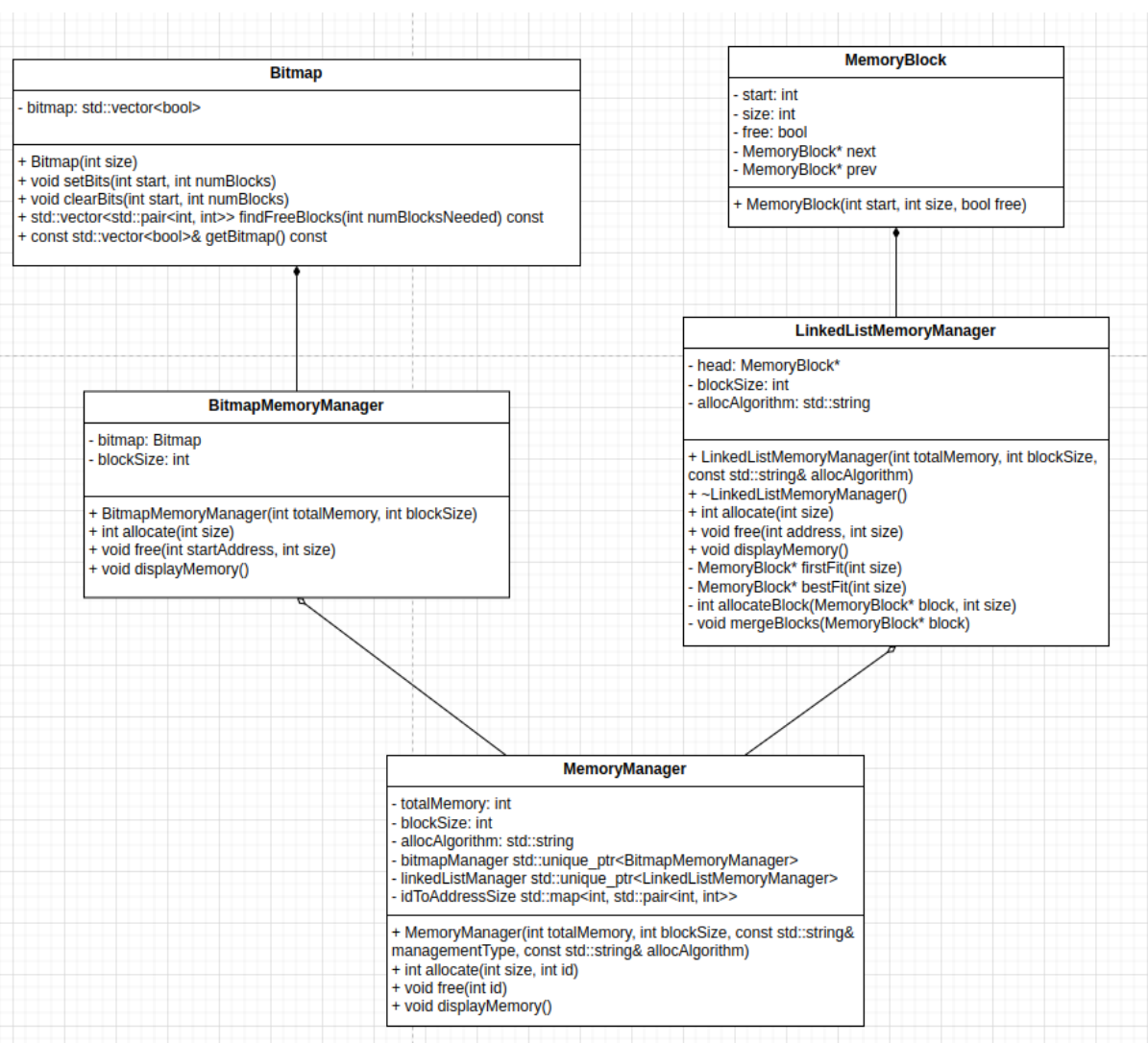
**INE512-07208 (20241) - Sistemas Operacionais I**

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## 1) Resumo

O presente trabalho tem por objetivo escrever um programa para simular o comportamento do gerenciamento de memória livre em sistemas operacionais modernos. Foram criadas 2 estruturas de dados (BitmapMemoryManager e LinkedListMemoryManager) para simular o gerenciamento de memória em bitmap e lista encadeada podendo utilizar os seguintes algoritmos de alocação: First Fit e Best Fit.

## 2) Diagrama de classes



### 3) Bitmap & First Fit

Input: commands.txt

1

1024

4

1

A 512 1

A 256 2

D 1

A 257 4

Output:

## Allocating 512 bytes with ID 1

Allocated 512 bytes at block 0

## Allocating 256 bytes with ID 2

Allocated 256 bytes at block 128

## Deallocating memory with ID 1

Freed 128 blocks starting from block 0

Successfully freed memory for ID 1 at address 0

## Allocating 257 bytes with ID 4

Allocated 257 bytes at block 0

### Memory Bitmap:

[illegible][illegible][illegible]

000

[illegible]

#### 4) Bitmap & Best Fit

Input: commands.txt

1

1024

4

2

A 512 1

A 256 2

D 1

A 257 4

Output:

## Allocating 512 bytes with ID 1

Allocated 512 bytes at block 0

## Allocating 256 bytes with ID 2

Allocated 256 bytes at block 128

## Deallocating memory with ID 1

Freed 128 blocks starting from block 0

Successfully freed memory for ID 1 at address 0

## Allocating 257 bytes with ID 4

Allocated 257 bytes at block 0

### Memory Bitmap:

[illegible][illegible][illegible]

000

[illegible]

## 5) Lista Ligada & First Fit

Input: commands.txt

2

1024

4

1

A 512 1

A 256 2

D 1

A 257 4

Output:

Allocating 512 bytes with ID 1

Allocated 512 bytes at address 0

Allocating 256 bytes with ID 2

Allocated 256 bytes at address 512

Deallocating memory with ID 1

Freed 512 bytes starting at address 0

Successfully freed memory for ID 1 at address 0

Allocating 257 bytes with ID 4

Allocated 257 bytes at address 0

Block at 0, size 257, occupied

Block at 257, size 255, free

Block at 512, size 256, occupied

Block at 768, size 256, free

```
william@rix:~/Documents/UFSC/SOI/t2$ ./MemoryManagerApp commands.txt
Allocating 512 bytes with ID 1
Allocated 512 bytes at address 0
Allocating 256 bytes with ID 2
Allocated 256 bytes at address 512
Deallocating memory with ID 1
Freed 512 bytes starting at address 0
Successfully freed memory for ID 1 at address 0
Allocating 257 bytes with ID 4
Allocated 257 bytes at address 0
Block at 0, size 257, occupied
Block at 257, size 255, free
Block at 512, size 256, occupied
Block at 768, size 256, free
```

## 6) Lista Ligada & Best Fit

Input: commands.txt

2

1024

4

2

A 512 1

A 256 2

D 1

A 257 4

Output:

Allocating 512 bytes with ID 1

Allocated 512 bytes at address 0

Allocating 256 bytes with ID 2

Allocated 256 bytes at address 512

Deallocating memory with ID 1

Freed 512 bytes starting at address 0

Successfully freed memory for ID 1 at address 0

Allocating 257 bytes with ID 4

Allocated 257 bytes at address 0

Block at 0, size 257, occupied

Block at 257, size 255, free

Block at 512, size 256, occupied

Block at 768, size 256, free

```
william@drion:~/Documents/UFSC/SOI/t2$ ./MemoryManagerApp commands.txt
Allocating 512 bytes with ID 1
Allocated 512 bytes at address 0
Allocating 256 bytes with ID 2
Allocated 256 bytes at address 512
Deallocating memory with ID 1
Freed 512 bytes starting at address 0
Successfully freed memory for ID 1 at address 0
Allocating 257 bytes with ID 4
Allocated 257 bytes at address 0
Block at 0, size 257, occupied
Block at 257, size 255, free
Block at 512, size 256, occupied
Block at 768, size 256, free
william@drion:~/Documents/UFSC/SOI/t2$
```