

# Operating Systems

## “Mini Project 😊”

### Memory Allocation

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Section : 1

## How the program works:

- 1) Choose the size of Memory.
- 2) State the size of a hole and its starting address then hit “add hole”.
- 3) Repeat step 2 as desired.
- 4) After finishing adding the holes click “done”.
- 5) You can now allocate or deallocate any process you want.
- 6) To deallocate any process just double click on its row -as simple as that 😊-.
- 7) To allocate a process choose the desired Methodology.
- 8) Then choose the size of the process and click “allocate process”.
- 9) Any status will appear into a status box

Here is a test case for demonstration :

1) This is the initial shape of the program

The screenshot shows a window titled "Memory Management" with three main configuration panels and a status area at the bottom.

- Memory Size Panel:** Contains radio buttons for "Giga Byte", "Mega Byte", "Kilo Byte", and "Byte". The "Byte" option is selected. A numeric input field shows the value "1", and a "Set" button is located to its right.
- Make Holes Panel:** Contains radio buttons for "Giga Byte", "Mega Byte", "Kilo Byte", and "Byte". The "Byte" option is selected. A numeric input field shows the value "1". Below these is a "Starting Address" input field with the value "0", an "Add Hole" button to its right, and a "Done" button at the bottom.
- Allocate Process Panel:** Contains a sub-panel for "algorithm type" with radio buttons for "First Fit" (selected), "Best Fit", and "fragmentation". To the right of this sub-panel are radio buttons for "Giga Byte", "Mega Byte", "Kilo Byte", and "Byte", with "Byte" selected. A numeric input field shows the value "1". A "P1" label is positioned above this field. An "AllocateProcess" button is at the bottom.
- Status Area:** Located at the bottom, it features a large empty text box labeled "Status" and a "Reset" button to its right.

## 2) Set the size of memory to 1 kilobyte

The screenshot shows the 'Memory Management' application window. It has three main sections: 'Memory Size', 'Make Holes', and 'Allocate Process'. In the 'Memory Size' section, 'Kilo Byte' is selected with a value of 1. In the 'Make Holes' section, 'Byte' is selected with a value of 1, and the 'Starting Address' is 0. In the 'Allocate Process' section, 'First Fit' is selected as the algorithm type, and 'P1' is entered as the process name with a value of 1. A 'Status' box at the bottom shows the message 'Memory size is set successfully' in green text. A 'Reset' button is also visible.

Section	Option	Value
Memory Size	Giga Byte	
	Mega Byte	
	Kilo Byte	1
	Byte	
Make Holes	Giga Byte	
	Mega Byte	
	Kilo Byte	
	Byte	1
Allocate Process	algorithm type	First Fit
	Giga Byte	
	Mega Byte	
	Kilo Byte	1

## 3) Adding holes

	Size	starting address	
1.	10	25	
2.	40	50	
3.	10	100	
4.	100	150	
5.	200	500	
6.	15	5	
7.	200	1000	out of memory:ex check error

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Size: 1

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Size: 10

Starting Address

25

Add Hole

Done

Status

The hole is added successfully

Reset

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Size: 1

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Size: 40

Starting Address

50

Add Hole

Done

Status

The hole is added successfully

Reset

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Size: 1

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Size: 10

Starting Address

100

Add Hole

Done

Status

The hole is added successfully

Reset

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Size: 1

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Size: 100

Starting Address

150

Add Hole

Done

Status

The hole is added successfully

Reset

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Size: 1

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Size: 200

Starting Address

500

Add Hole

Done

Status

The hole is added successfully

Reset

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Size: 1

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Size: 15

Starting Address

5

Add Hole

Done

Status

The hole is added successfully

Reset

### Memory Size

- ☐ Giga Byte  
☐ Mega Byte  
☒ Kilo Byte  
☐ Byte

1

Set

### Make Holes

- ☐ Giga Byte  
☐ Mega Byte  
☐ Kilo Byte  
☒ Byte

200

### Starting Address

1000

Add Hole

Done

### Status

Error: you want to set a hole Out of memory size

Reset

#### 4) After Clicking Done the shape of the memory will be

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Starting Address

Allocate Process

algorithm type ☐ Giga Byte

☐ First Fit ☐ Mega Byte P8

☐ Best Fit ☐ Kilo Byte

☐ fragmentation ☒ Byte

Status

the holes is added successfully

Result

Starting Address	Size	PID
0	5 Byte	P1
5	15 Byte	Hole
20	5 Byte	P2
25	10 Byte	Hole
35	15 Byte	P3
50	40 Byte	Hole
90	10 Byte	P4
100	10 Byte	Hole
110	40 Byte	P5
150	100 Byte	Hole

To deallocate any process just double click on it in the table

Size of holes = 375 byte

150	100 Byte	Hole
250	250 Byte	P6
500	200 Byte	Hole
700	324 Byte	P7

## 5) Allocate process P8 with size 1byte and first fit algorithm

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

1

Set

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

200

Starting Address

500

Add Hole

Done

Allocate Process

algorithm type

☒ First Fit

☐ Best Fit

☐ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P9

1

AllocateProcess

Status

The process p8 is allocated successfully

Reset

Result

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	14 Byte	Hole
20	5 Byte	P2
25	10 Byte	Hole
35	15 Byte	P3
50	40 Byte	Hole
90	10 Byte	P4
100	10 Byte	Hole
110	40 Byte	P5

To deallocate any process just double click on it in the table

Size of holes = 374 byte

110	40 Byte	P5
150	100 Byte	Hole
250	250 Byte	P6
500	200 Byte	Hole
700	324 Byte	P7



## 6) Deallocate P4

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

1

Set

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

200

Starting Address

500

Add Hole

Done

Allocate Process

algorithm type

☒ First Fit

☐ Best Fit

☐ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P9

1

AllocateProcess

Status

P4 is deallocated successfully

Reset

Result

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	14 Byte	Hole
20	5 Byte	P2
25	10 Byte	Hole
35	15 Byte	P3
50	60 Byte	Hole
110	40 Byte	P5
150	100 Byte	Hole
250	250 Byte	P6

To deallocate any process just double click on it in the table

Size of holes = 384 byte

250	250 Byte	P6
500	200 Byte	Hole
700	324 Byte	P7

## 7) Allocate process P9 with size 10 byte and Best fit algorithm

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Starting Address

Allocate Process

algorithm type ☐ First Fit ☒ Best Fit ☐ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Status

The process p9 is allocated successfully

Result

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	14 Byte	Hole
20	5 Byte	P2
25	10 Byte	P9
35	15 Byte	P3
50	60 Byte	Hole
110	40 Byte	P5
150	100 Byte	Hole
250	250 Byte	P6

To deallocate any process just double click on it in the table

Size of holes = 374 byte

250	250 Byte	P6
500	200 Byte	Hole
700	324 Byte	P7

8) Allocate process P10 with size 300 byte and Best fit algorithm without fragmentation “ allocated is failed ”

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

1

Set

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

15

Starting Address

5

Add Hole

Done

Allocate Process

algorithm type

☐ First Fit

☒ Best Fit

☐ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P10

300

AllocateProcess

Status

There is no enough size to allocate this process

Reset

Result

Starting Address	Size	PID
6	14 Byte	Hole
20	5 Byte	P2
25	10 Byte	P9
35	15 Byte	P3
50	60 Byte	Hole
110	40 Byte	P5
150	100 Byte	Hole
250	250 Byte	P6
500	200 Byte	Hole
700	324 Byte	P7

To deallocate any process just double click on it in the table

Size of holes = 374 byte

## 9) Allocate process P10 with size 300 byte and Best fit algorithm with fragmentation

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

Starting Address

Allocate Process

algorithm type

☐ First Fit

☒ Best Fit

☒ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P11

Status

The process p10 is allocated successfully

Result

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	5 Byte	P2
11	10 Byte	P9
21	15 Byte	P3
36	40 Byte	P5
76	250 Byte	P6
326	324 Byte	P7
650	300 Byte	P10
950	74 Byte	Hole

To deallocate any process just double click on it in the table

Size of holes = 74 byte

## 10) Allocate process P11 with size 74 byte and Best fit algorithm with fragmentation

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

1

Set

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

15

Starting Address

5

Add Hole

Done

Allocate Process

algorithm type

☐ First Fit

☒ Best Fit

☒ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P12

74

AllocateProcess

Status

The process p11 is allocated successfully

Reset

Result

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	5 Byte	P2
11	10 Byte	P9
21	15 Byte	P3
36	40 Byte	P5
76	250 Byte	P6
326	324 Byte	P7
650	300 Byte	P10
950	74 Byte	P11

To deallocate any process just double click on it in the table

Size of holes = 0 byte

11) Allocate process P12 with size 1 byte and Best fit algorithm with fragmentation “allocated is failed”

The screenshot shows a 'Memory Management' application window. It has three main configuration panels at the top: 'Memory Size', 'Make Holes', and 'Allocate Process'. The 'Allocate Process' panel shows process P12 with a size of 1 Byte and the 'Best Fit' algorithm selected. The 'Status' section displays a yellow error message: 'There is no enough size to allocate this process'. Below this, a 'Result' table lists current memory allocations. To the right of the table, it states 'Size of holes = 0 byte'.

**Memory Management**

**Memory Size**

- ☐ Giga Byte
- ☐ Mega Byte
- ☒ Kilo Byte
- ☐ Byte

**Make Holes**

- ☐ Giga Byte
- ☐ Mega Byte
- ☐ Kilo Byte
- ☒ Byte

**Allocate Process**

algorithm type

- ☐ First Fit
- ☒ Best Fit
- ☒ fragmentation

**P12**

Size: 1

**Status**

There is no enough size to allocate this process

**Result**

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	5 Byte	P2
11	10 Byte	P9
21	15 Byte	P3
36	40 Byte	P5
76	250 Byte	P6
326	324 Byte	P7
650	300 Byte	P10
950	74 Byte	P11

To deallocate any process just double click on it in the table

Size of holes = 0 byte

## 12) Deallocate P7

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

1

↓

Set

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

15

↓

Starting Address

5

↓

Add Hole

Done

Allocate Process

algorithm type

☐ First Fit

☒ Best Fit

☐ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P12

1

↓

AllocateProcess

Status

P7 is deallocated successfully

Reset

Result

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	5 Byte	P2
11	10 Byte	P9
21	15 Byte	P3
36	40 Byte	P5
76	250 Byte	P6
326	324 Byte	Hole
650	300 Byte	P10
950	74 Byte	P11

To deallocate any process just double click on it in the table

Size of holes = 324 byte

# 13) Allocate process P12 with size 324 byte and first fit algorithm with fragmentation

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

1

▼

Set

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

15

▼

Starting Address

5

▼

Add Hole

Done

Allocate Process

algorithm type

☒ First Fit

☐ Best Fit

☒ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P13

324

▼

AllocateProcess

Status

The process p12 is allocated successfully

Reset

Result

Starting Address	Size	PID
0	5 Byte	P1
5	1 Byte	P8
6	5 Byte	P2
11	10 Byte	P9
21	15 Byte	P3
36	40 Byte	P5
76	250 Byte	P6
326	324 Byte	P12
650	300 Byte	P10
950	74 Byte	P11

To deallocate any process just double click on it in the table

Size of holes = 0 byte



## 14) Deallocate all processes

Memory Management

Memory Size

☐ Giga Byte

☐ Mega Byte

☒ Kilo Byte

☐ Byte

1

↓

Set

Make Holes

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

15

↓

Starting Address

5

↓

Add Hole

Done

Allocate Process

algorithm type

☒ First Fit

☐ Best Fit

☒ fragmentation

☐ Giga Byte

☐ Mega Byte

☐ Kilo Byte

☒ Byte

P13

324

↓

AllocateProcess

Status

P11 is deallocated successfully

Reset

Result

Starting Address	Size	PID
0	1 KB	Hole

To deallocate any process just double click on it in the table

Size of holes = 1024 byte