



Operating systems



Program:

Course Name: operating systems

Submitted to:

Dr: sahar haggag

**Ain Shams University
Faculty of Engineering
CSE Department
2021**



Student Personal Information for Group Work

Student Names:

آلاء ابراهيم محمد ابراهيم عامر
آلاء شعبان حسين على شتات
نهلة مصطفى عبدالكريم محمد

Student Codes and Section:

1700267, Section 1
1700271, Section 1
1601583, Section 5



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2. GUI

Form1

Memory Size:

Start Address of Each Hole:
Please enter the start address of each hole

Size Of Hole:
Please enter the size of each hole

Processes:
P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method: ☐ First Fit ☐ Best Fit ☐ Worst Fit

de-allocate process:
Example: 1

de-allocate Old Process:
Example: 1

3. First Fit

3.1 Process Fit

3.1.1 Example1

Form1

Memory Size:

Start Address of Each Hole:
Please enter the start address of each hole

Size Of Hole:
Please enter the size of each hole

Processes:
P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method: ☒ First Fit ☐ Best Fit ☐ Worst Fit

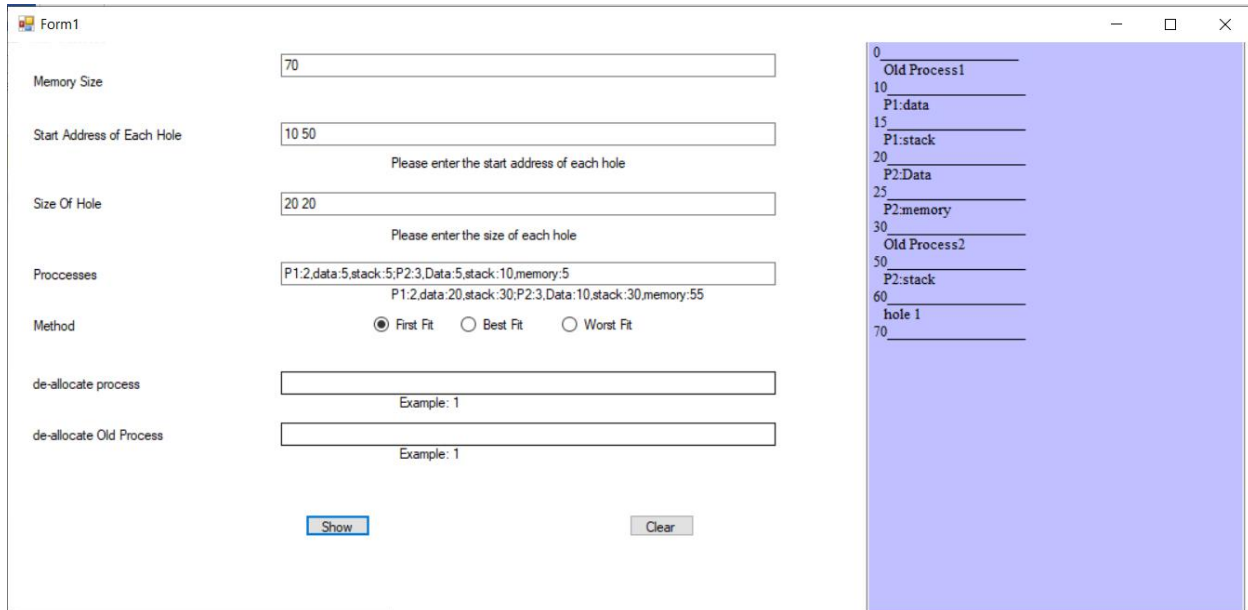
de-allocate process:
Example: 1

de-allocate Old Process:
Example: 1

Memory Layout:

```
0
Old Process1
10
P1:data
30
Old Process2
50
P1:stack
80
P2:Data
90
hole 1
95
Old Process3
100
P2:stack
130
hole 2
160
Old Process4
200
P2:memory
255
hole 3
300
Old Process5
1000
```

3.1.2 Example2



The interface shows the following inputs and outputs:

- Memory Size:** 70
- Start Address of Each Hole:** 10 50
- Size Of Hole:** 20 20
- Processes:** P1:2,data:5,stack:5;P2:3,Data:5,stack:10,memory:5
P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55
- Method:** ☒ First Fit ☐ Best Fit ☐ Worst Fit
- de-allocate process:** Example: 1
- de-allocate Old Process:** Example: 1
- Buttons:** Show, Clear
- Memory Map (Right Panel):**

```

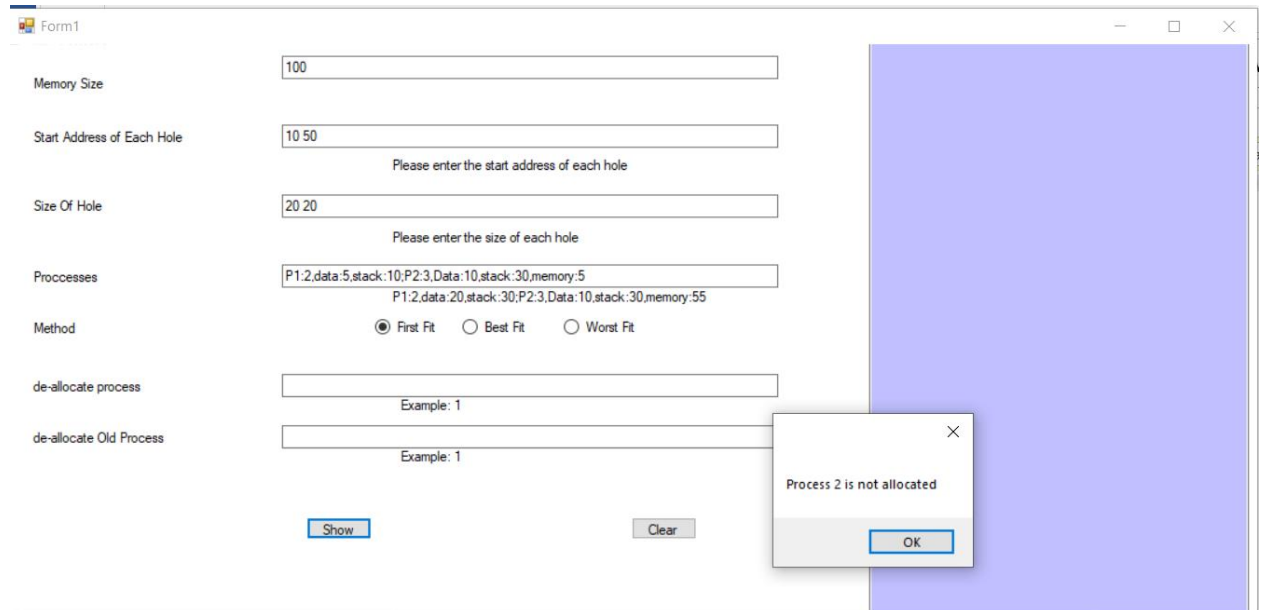
0
Old Process1
10
P1:data
15
P1:stack
20
P2:Data
25
P2:memory
30
Old Process2
50
P2:stack
60
hole 1
70

```

3.2 Process does not fit

3.2.1 Example 1

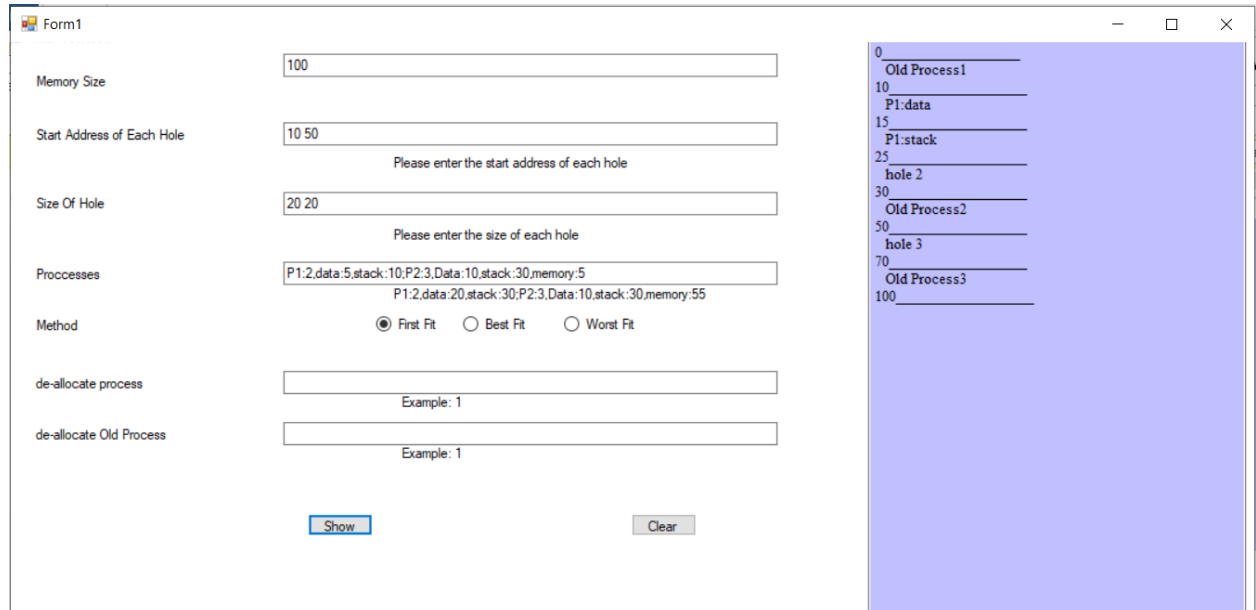
When a process cannot be allocated



The interface shows the following inputs and outputs:

- Memory Size:** 100
- Start Address of Each Hole:** 10 50
- Size Of Hole:** 20 20
- Processes:** P1:2,data:5,stack:10;P2:3,Data:10,stack:30,memory:5
P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55
- Method:** ☒ First Fit ☐ Best Fit ☐ Worst Fit
- de-allocate process:** Example: 1
- de-allocate Old Process:** Example: 1
- Buttons:** Show, Clear
- Memory Map (Right Panel):** (Empty)
- Dialog Box:** Process 2 is not allocated (OK)

We can see that process 2 is not allocated:



Form1

Memory Size: 100

Start Address of Each Hole: 10 50
Please enter the start address of each hole

Size Of Hole: 20 20
Please enter the size of each hole

Processes: P1:2,data:5,stack:10;P2:3,Data:10,stack:30,memory:55
P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method: ☒ First Fit ☐ Best Fit ☐ Worst Fit

de-allocate process: Example: 1

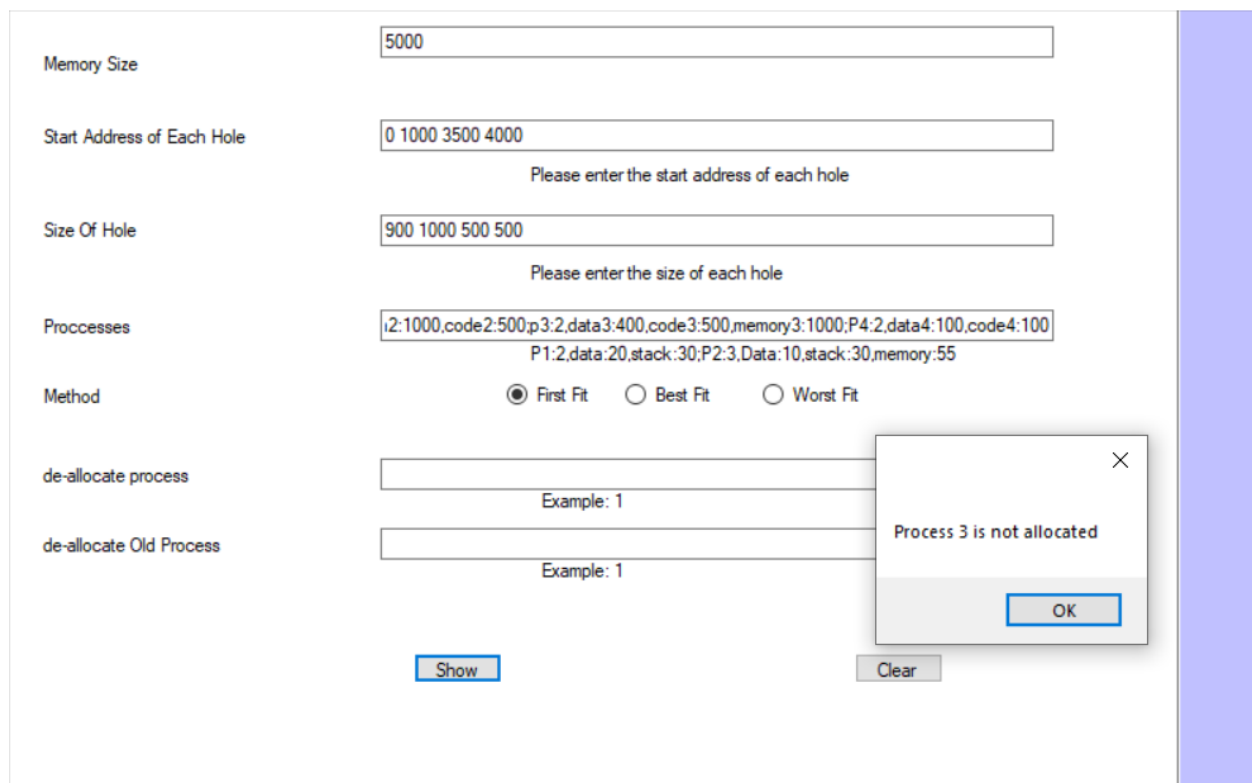
de-allocate Old Process: Example: 1

Show Clear

0
Old Process1
10
P1: data
15
P1: stack
25
hole 2
30
Old Process2
50
hole 3
70
Old Process3
100

3.2.2 Example2

When a process cannot be allocated:



Form1

Memory Size: 5000

Start Address of Each Hole: 0 1000 3500 4000
Please enter the start address of each hole

Size Of Hole: 900 1000 500 500
Please enter the size of each hole

Processes: i2:1000,code2:500;p3:2,data3:400,code3:500,memory3:1000;P4:2,data4:100,code4:100
P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method: ☒ First Fit ☐ Best Fit ☐ Worst Fit

de-allocate process: Example: 1

de-allocate Old Process: Example: 1

Show Clear

Process 3 is not allocated

OK



As we can see process 3 is not allocated:

Memory Size	<input type="text" value="5000"/>	<pre>0 P1:data1 100 P1:code1 300 P2:code2 800 P4:data4 900 Old Process1 1000 P2:data2 2000 Old Process2 3500 P4:code4 3600 hole 1 4500 Old Process3 5000</pre>
Start Address of Each Hole	<input type="text" value="0 1000 3500 4000"/> Please enter the start address of each hole	
Size Of Hole	<input type="text" value="900 1000 500 500"/> Please enter the size of each hole	
Processes	<input type="text" value="P1:2,code:2,500;p3:2,data:3,400,code:3,500,memory:3,1000;P4:2,data:4,100,code:4,100"/> P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55	
Method	<input checked="" type="radio"/> First Fit <input type="radio"/> Best Fit <input type="radio"/> Worst Fit	
de-allocate process	<input type="text" value="Example: 1"/>	
de-allocate Old Process	<input type="text" value="Example: 1"/>	
<div>Show Clear</div>		

4. Best Fit

4.1 Process Fit

Example1

Form1		<pre>0 Old Process1 5 p3:data3 15 p3:code3 25 p3:memo3 30 Old Process2 40 P1:data1 45 P2:code2 50 Old Process3 60 P1:code1 80 Old Process4 85 P2:data2 95 hole 1 100</pre>
Memory Size	<input type="text" value="100"/>	
Start Address of Each Hole	<input type="text" value="5 40 60 85"/> Please enter the start address of each hole	
Size Of Hole	<input type="text" value="25 10 20 15"/> Please enter the size of each hole	
Processes	<input type="text" value="P1:2,data:1,5,code:1,20;P2:3,data:2,10,code:2,5;p3:2,data:3,10,code:3,10,memory:3,5"/> P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55	
Method	<input type="radio"/> First Fit <input checked="" type="radio"/> Best Fit <input type="radio"/> Worst Fit	
de-allocate process	<input type="text" value="Example: 1"/>	
de-allocate Old Process	<input type="text" value="Example: 1"/>	
<div>Show Clear</div>		



4.2 Process does not fit

Example 1

When a process cannot be allocated:

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 60 85
Please enter the start address of each hole

Size Of Hole: 25 10 20 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5,memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☒ Best Fit ☐ Worst Fit

de-allocate process:

de-allocate Old Process:

Show Clear

Process 3 is not allocated

OK

We can see that Process 3 is not allocated

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 60 85
Please enter the start address of each hole

Size Of Hole: 25 10 20 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5,memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☒ Best Fit ☐ Worst Fit

de-allocate process:

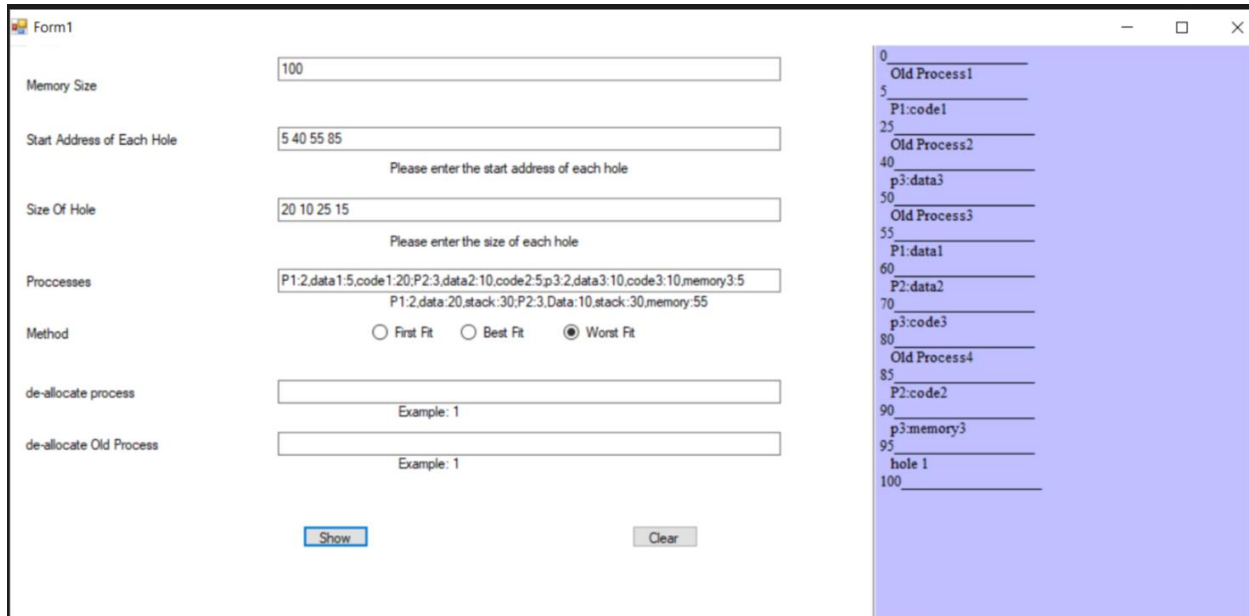
de-allocate Old Process:

Show Clear

0
Old Process1
5
P4:data4
15
P4:code4
25
hole 1
30
Old Process2
40
P1:data1
45
P2:code2
50
Old Process3
60
P1:code1
80
Old Process4
85
P2:data2
95
hole 2
100

5. Worst Fit

5.1 Process Fit



Form1

Memory Size: 100

Start Address of Each Hole: 5 40 55 85
Please enter the start address of each hole

Size Of Hole: 20 10 25 15
Please enter the size of each hole

Processes: P1:2,data1:5,code1:20;P2:3,data2:10,code2:5;p3:2,data3:10,code3:10,memory3:5;P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method: ☐ First Fit ☐ Best Fit ☒ Worst Fit

de-allocate process:
Example: 1

de-allocate Old Process:
Example: 1

Show Clear

Memory Map:

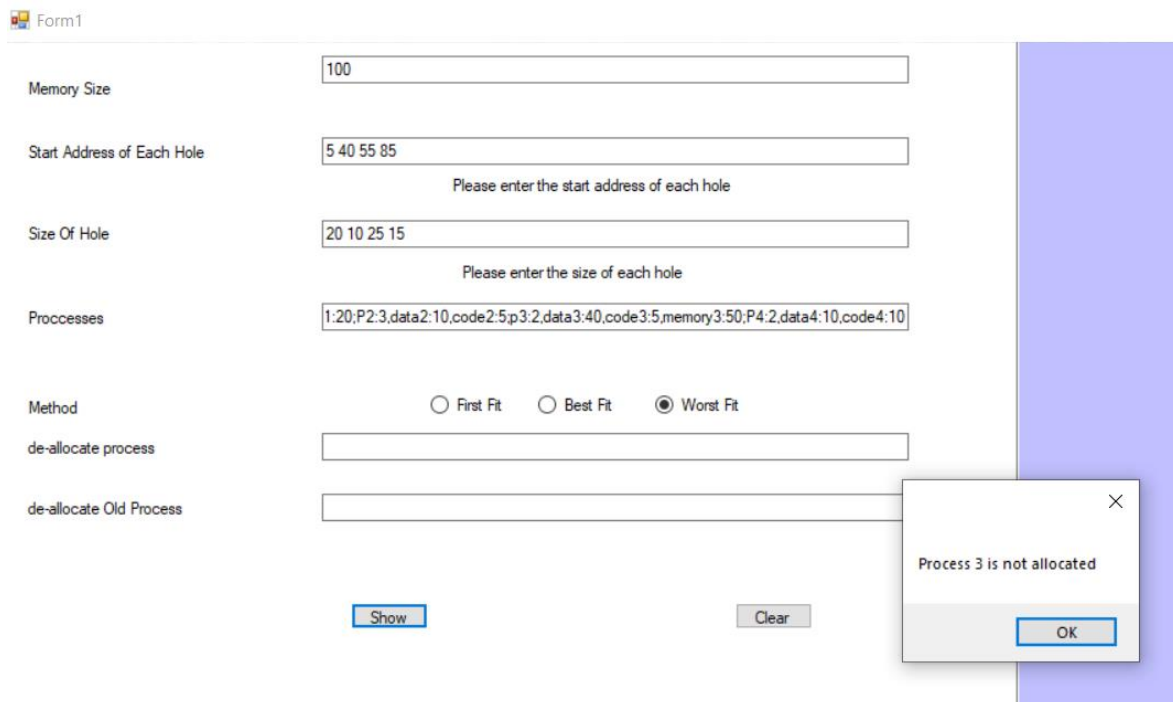
```

0
Old Process1
5
P1:code1
25
Old Process2
40
p3:data3
50
Old Process3
55
P1:data1
60
P2:data2
70
p3:code3
80
Old Process4
85
P2:code2
90
p3:memo3
95
hole 1
100
  
```

4.2 Process does not fit

Example 1:

When a process cannot be allocated:



Form1

Memory Size: 100

Start Address of Each Hole: 5 40 55 85
Please enter the start address of each hole

Size Of Hole: 20 10 25 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5,memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☐ Best Fit ☒ Worst Fit

de-allocate process:
Example: 1

de-allocate Old Process:
Example: 1

Show Clear

Memory Map:

```

0
Old Process1
5
P1:code1
25
Old Process2
40
p3:data3
50
Old Process3
55
P1:data1
60
P2:data2
70
p3:code3
80
Old Process4
85
P2:code2
90
p3:memo3
95
hole 1
100
  
```

Process 3 is not allocated

OK

As we can see that the process 3 is not allocated:



Form1

Memory Size: 100

Start Address of Each Hole: 5 40 55 85
Please enter the start address of each hole

Size Of Hole: 20 10 25 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5;memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☐ Best Fit ☒ Worst Fit

de-allocate process:

de-allocate Old Process:

Show Clear

0
Old Process1
5
P1:code1
25
Old Process2
40
P4:data4
50
Old Process3
55
P1:data1
60
P2:data2
70
P4:code4
80
Old Process4
85
P2:code2
90
hole 1
100

6. De-allocate Old Process

Example1: Best Fit

Before de-allocation:

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 60 85
Please enter the start address of each hole

Size Of Hole: 25 10 20 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5;memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☒ Best Fit ☐ Worst Fit

de-allocate process:

de-allocate Old Process:

Show Clear

0
Old Process1
5
P4:data4
15
P4:code4
25
hole 1
30
Old Process2
40
P1:data1
45
P2:code2
50
Old Process3
60
P1:code1
80
Old Process4
85
P2:data2
95
hole 2
100

After De-allocation:



Form1

Memory Size: 100

Start Address of Each Hole: 5 40 60 85
Please enter the start address of each hole

Size Of Hole: 25 10 20 15
Please enter the size of each hole

Processes: 1:20;P2:3,data:10,code:2;5;p3:2,data:3;40,code:3;5;memory:3;50;P4:2,data:4;10,code:4;10
P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method: ☐ First Fit ☒ Best Fit ☐ Worst Fit

de-allocate process: 1
Example: 1

de-allocate Old Process: 2
Example: 1

Show Clear

0
Old Process1
5
P4:data4
15
P4:code4
25
hole 1
45
P2:code2
50
Old Process2
60
hole 2
80
Old Process3
85
P2:data2
95
hole 3
100

Example 2: Worst Fit Before de-allocation:

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 55 85
Please enter the start address of each hole

Size Of Hole: 20 10 25 15
Please enter the size of each hole

Processes: 1:20;P2:3,data:10,code:2;5;p3:2,data:3;40,code:3;5;memory:3;50;P4:2,data:4;10,code:4;10

Method: ☐ First Fit ☐ Best Fit ☒ Worst Fit

de-allocate process:

de-allocate Old Process:

Show Clear

0
Old Process1
5
P1:code1
25
Old Process2
40
P4:data4
50
Old Process3
55
P1:data1
60
P2:data2
70
P4:code4
80
Old Process4
85
P2:code2
90
hole 1
100

After de-allocation



Form1

Memory Size: 100

Start Address of Each Hole: 5 40 55 85
Please enter the start address of each hole

Size Of Hole: 20 10 25 15
Please enter the size of each hole

Processes: je1:20;P2:3,data2:10,code2:5;p3:2,data3:5,code3:40,memory3:50;P4:2,data4:10,code4:10;P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method: ☐ First Fit ☐ Best Fit ☒ Worst Fit

de-allocate process: Example: 1

de-allocate Old Process: 3
Example: 1

Show Clear

0
Old Process1
5
P1:code1
25
Old Process2
40
P4:data4
50
hole 1
55
P1:data1
60
P2:data2
70
P4:code4
80
Old Process3
85
P2:code2
90
hole 2
100



Example3: First Fit

Before de-allocation:

Memory Size	<input type="text" value="5000"/>	<pre>0 P1:data1 100 P1:code1 300 P2:code2 800 P3:data3 900 Old Process1 1000 P2:data2 2000 Old Process2 3500 P3:code3 3600 hole 1 4500 Old Process3 5000</pre>
Start Address of Each Hole	<input type="text" value="0 1000 3500 4000"/> <small>Please enter the start address of each hole</small>	
Size Of Hole	<input type="text" value="900 1000 500 500"/> <small>Please enter the size of each hole</small>	
Processes	<input type="text" value="P1:2,data1:100,code1:200;P2:3,data2:1000,code2:500;P3:2,data3:100,code3:100"/> <small>P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55</small>	
Method	<input checked="" type="radio"/> First Fit <input type="radio"/> Best Fit <input type="radio"/> Worst Fit	
de-allocate process	<input type="text" value="Example: 1"/>	
de-allocate Old Process	<input type="text" value="Example: 1"/>	
<input type="button" value="Show"/> <input type="button" value="Clear"/>		

After de-allocation:

Memory Size	<input type="text" value="5000"/>	<pre>0 P1:data1 100 P1:code1 300 P2:code2 800 P3:data3 900 Old Process1 1000 P2:data2 2000 Old Process2 3500 P3:code3 3600 hole 1 5000</pre>
Start Address of Each Hole	<input type="text" value="0 1000 3500 4000"/> <small>Please enter the start address of each hole</small>	
Size Of Hole	<input type="text" value="900 1000 500 500"/> <small>Please enter the size of each hole</small>	
Processes	<input type="text" value="P1:2,data1:100,code1:200;P2:3,data2:1000,code2:500;P3:2,data3:100,code3:100"/> <small>P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55</small>	
Method	<input checked="" type="radio"/> First Fit <input type="radio"/> Best Fit <input type="radio"/> Worst Fit	
de-allocate process	<input type="text" value="Example: 1"/>	
de-allocate Old Process	<input type="text" value="3"/> <small>Example: 1</small>	
<input type="button" value="Show"/> <input type="button" value="Clear"/>		



7. De-allocate a Process

Example 1: Best Fit

Before de-allocation:

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 60 85
Please enter the start address of each hole

Size Of Hole: 25 10 20 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5,memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☒ Best Fit ☐ Worst Fit

de-allocate process:

de-allocate Old Process:

Show Clear

0
Old Process1
5
P4:data4
15
P4:code4
25
hole 1
30
Old Process2
40
P1:data1
45
P2:code2
50
Old Process3
60
P1:code1
80
Old Process4
85
P2:data2
95
hole 2
100

After De-allocation:

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 60 85
Please enter the start address of each hole

Size Of Hole: 25 10 20 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5,memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☒ Best Fit ☐ Worst Fit

de-allocate process: 2

de-allocate Old Process:

Show Clear

0
Old Process1
5
P4:data4
15
P4:code4
25
hole 1
30
Old Process2
40
P1:data1
45
hole 2
50
Old Process3
60
P1:code1
80
Old Process4
85
hole 3
100



Example2: Worst Fit

Before de-allocation:

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 60 85
Please enter the start address of each hole

Size Of Hole: 25 10 20 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5,memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☒ Best Fit ☐ Worst Fit

de-allocate process:

de-allocate Old Process:

Show Clear

0
Old Process1
5
P4:data4
15
P4:code4
25
hole 1
30
Old Process2
40
P1:data1
45
P2:code2
50
Old Process3
60
P1:code1
80
Old Process4
85
P2:data2
95
hole 2
100

After de-allocation:

Form1

Memory Size: 100

Start Address of Each Hole: 5 40 55 85
Please enter the start address of each hole

Size Of Hole: 20 10 25 15
Please enter the size of each hole

Processes: 1:20;P2:3,data2:10,code2:5;p3:2,data3:40,code3:5,memory3:50;P4:2,data4:10,code4:10

Method: ☐ First Fit ☐ Best Fit ☒ Worst Fit

de-allocate process: 4

de-allocate Old Process:

Show Clear

0
Old Process1
5
P1:code1
25
Old Process2
40
hole 1
50
Old Process3
55
P1:data1
60
P2:data2
70
hole 2
80
Old Process4
85
P2:code2
90
hole 3
100



Example3: First Fit

Before de-allocation:

Memory Size	<input type="text" value="5000"/>
Start Address of Each Hole	<input type="text" value="0 1000 3500 4000"/> <small>Please enter the start address of each hole</small>
Size Of Hole	<input type="text" value="900 1000 500 500"/> <small>Please enter the size of each hole</small>
Processes	<input type="text" value="P1:2,data1:100,code1:200;P2:3,data2:1000,code2:500;P3:2,data3:100,code3:100"/> <small>P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55</small>
Method	<input checked="" type="radio"/> First Fit <input type="radio"/> Best Fit <input type="radio"/> Worst Fit
de-allocate process	<input type="text" value="Example: 1"/>
de-allocate Old Process	<input type="text" value="Example: 1"/>
<input type="button" value="Show"/> <input type="button" value="Clear"/>	

0

P1:data1

100

P1:code1

300

P2:code2

800

P3:data3

900

Old Process1

1000

P2:data2

2000

Old Process2

3500

P3:code3

3600

hole 1

4500

Old Process3

5000

After de-allocation P3:

Memory Size	<input type="text" value="5000"/>
Start Address of Each Hole	<input type="text" value="0 1000 3500 4000"/> <small>Please enter the start address of each hole</small>
Size Of Hole	<input type="text" value="900 1000 500 500"/> <small>Please enter the size of each hole</small>
Processes	<input type="text" value="P1:2,data1:100,code1:200;P2:3,data2:1000,code2:500;P3:2,data3:100,code3:100"/> <small>P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55</small>
Method	<input checked="" type="radio"/> First Fit <input type="radio"/> Best Fit <input type="radio"/> Worst Fit
de-allocate process	<input type="text" value="3"/> <small>Example: 1</small>
de-allocate Old Process	<input type="text" value="Example: 1"/>
<input type="button" value="Show"/> <input type="button" value="Clear"/>	

0

P1:data1

100

P1:code1

300

P2:code2

800

hole 1

900

Old Process1

1000

P2:data2

2000

Old Process2

3500

hole 2

4500

Old Process3

5000



8. Hole overlap:

Memory Size

75

Start Address of Each Hole

0 50

Please enter the start address of each hole

Size Of Hole

25 25

Please enter the size of each hole

Processes

p1:1,stack:5

P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method

☒ First Fit ☐ Best Fit ☐ Worst Fit

de-allocate process

Example: 1

de-allocate Old Process

Example: 1

Show

Clear

0

p1:stack

5

hole 1

25

Old Process1

50

hole 2

75

Remove the old process, so hole 1 and 2 become one big hole.

Memory Size

75

Start Address of Each Hole

0 50

Please enter the start address of each hole

Size Of Hole

25 25

Please enter the size of each hole

Processes

p1:1,stack:5

P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55

Method

☒ First Fit ☐ Best Fit ☐ Worst Fit

de-allocate process

Example: 1

de-allocate Old Process

1

Example: 1

Show

Clear

0

p1:stack

5

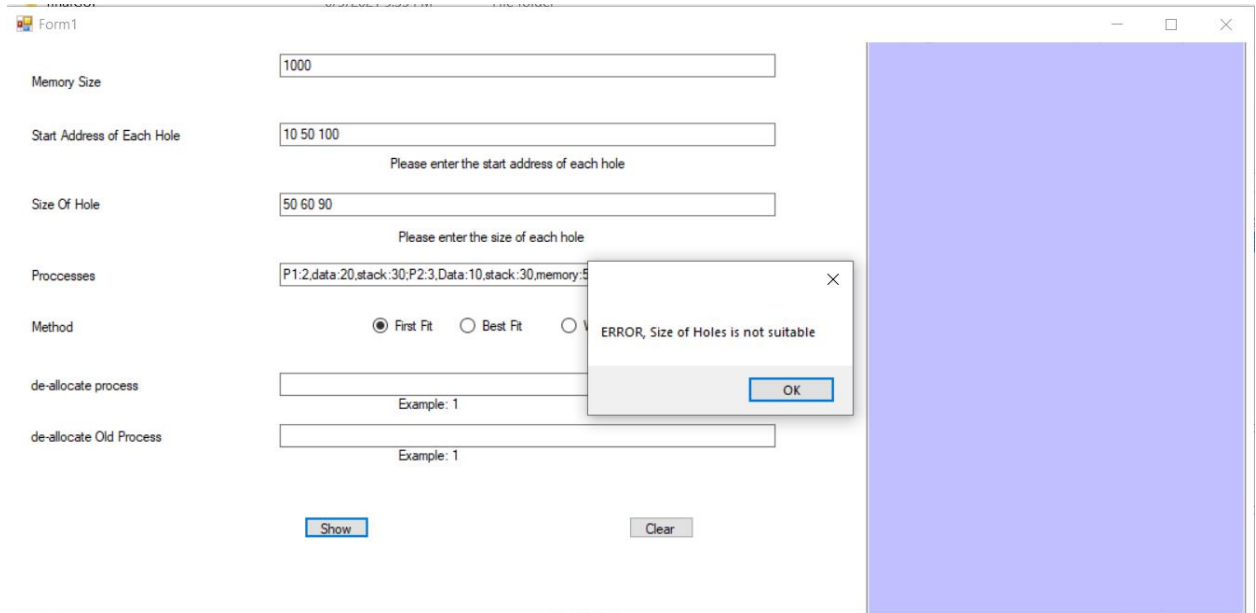
hole 1

75

9. ERRORS

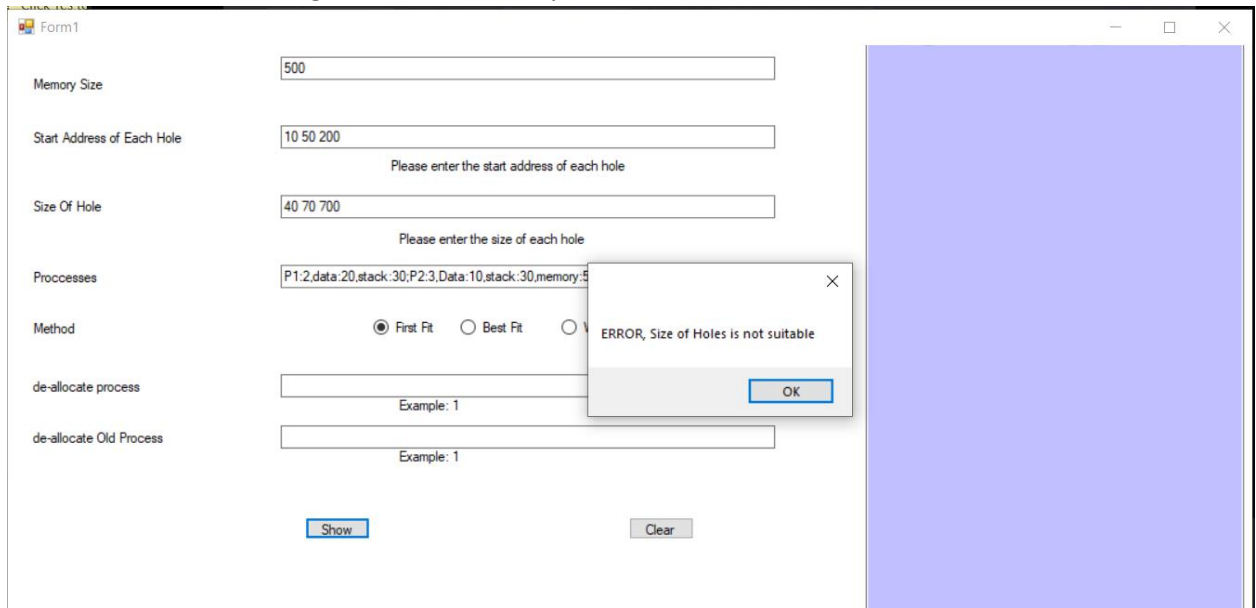
1. Size of holes is not suitable:

When the user enters a large hole size, and then add a hole within the range of this size.



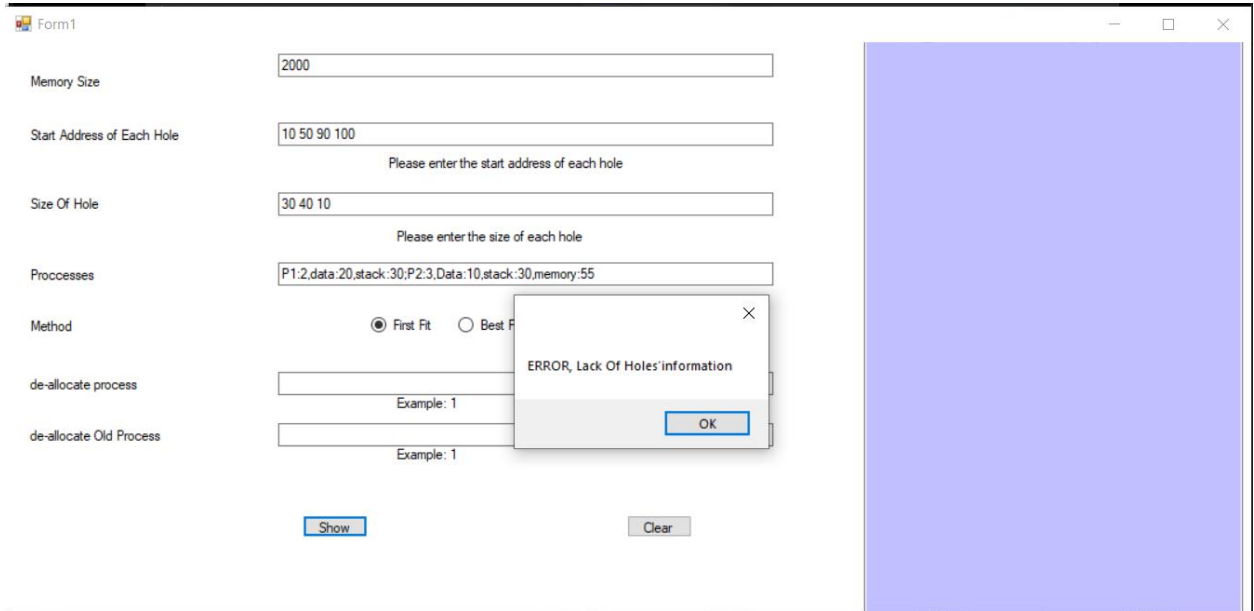
The screenshot shows a window titled "Form1" with several input fields and buttons. The fields are: "Memory Size" (1000), "Start Address of Each Hole" (10 50 100), "Size Of Hole" (50 60 90), "Processes" (P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:5), "Method" (First Fit selected), "de-allocate process" (Example: 1), and "de-allocate Old Process" (Example: 1). There are "Show" and "Clear" buttons at the bottom. An error dialog box is displayed in the center, with the text "ERROR, Size of Holes is not suitable" and an "OK" button.

2. When the holes size is larger than the memory size.



The screenshot shows a window titled "Form1" with several input fields and buttons. The fields are: "Memory Size" (500), "Start Address of Each Hole" (10 50 200), "Size Of Hole" (40 70 700), "Processes" (P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:5), "Method" (First Fit selected), "de-allocate process" (Example: 1), and "de-allocate Old Process" (Example: 1). There are "Show" and "Clear" buttons at the bottom. An error dialog box is displayed in the center, with the text "ERROR, Size of Holes is not suitable" and an "OK" button.

3. When the number of holes size is not equal the number of starting address “incomplete data”



The screenshot shows a GUI window titled 'Form1' with several input fields and buttons. The fields are labeled: 'Memory Size' (value: 2000), 'Start Address of Each Hole' (value: 10 50 90 100), 'Size Of Hole' (value: 30 40 10), 'Processes' (value: P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55), 'Method' (radio buttons for 'First Fit' and 'Best Fit'), 'de-allocate process' (value: Example: 1), and 'de-allocate Old Process' (value: Example: 1). There are 'Show' and 'Clear' buttons at the bottom. An error dialog box is overlaid on the GUI, titled 'ERROR, Lack Of Holes' information', with an 'OK' button.

9. Notes

- Language used : **C#**
- While scanning the user enters memory size, the starting address and the size of each hole separated with space, then the user should enters the processes as mentioned in the **GUI**, according to this sequence **“P1:2,data:20,stack:30;P2:3,Data:10,stack:30,memory:55”**, then select the method needed. According to the user selection, the required result will be printed.
- The algorithm used in memory allocation: **OOP** is used, **Memory** class that contains a list of Processes, holes, and segments, and methods that satisfy the requires algorithms “Sort old process according to holes input, First fit, Best fit, Worst fit, de-allocate a process, and de-allocate an old process”. **Process** class that contains a list of segments with the name, Starting address, and size. **Hole** class that contains the starting address and size. **Segment** class that contains the name, starting address, and size.

10. Bonus

1. Worst Fit Option.
2. Error checking on inputs.
3. In case of 2 successive holes, these two holes will be added as one holes.



11. Working Files

- You can find the working files in the link below:
https://drive.google.com/drive/folders/1uDtGNxXlr_GON0j8LakSMf1_NVoctgMT?usp=sharing

Each part separately:

- The code files:
https://drive.google.com/file/d/1SCcGGit6vn610tInkd21WyPE4Mf3i5J_/view?usp=sharing
- The executable files:
<https://drive.google.com/file/d/1wyktFY-MCw48XsvfYDbpZXlT8parrtgF/view?usp=sharing>
- Some input examples:
https://drive.google.com/file/d/1ly-6YFgoYOeMcsAGyouYt6xO52_KcbYm/view?usp=sharing
- Code as text file:
 - Classes:
https://drive.google.com/file/d/1magg-UGap_Xu00Z1KQjSmc8ipe3aCnM03/view?usp=sharing
 - Form-handle:
<https://drive.google.com/file/d/1ztRXy4dD8zLhCyCZNCLePLuxoAX7nxm6/view?usp=sharing>
- Examples Screenshots:
https://drive.google.com/drive/folders/1-HMuS7h7E4PZPz_qsrBVtLPh59Xe4FR7?usp=sharing