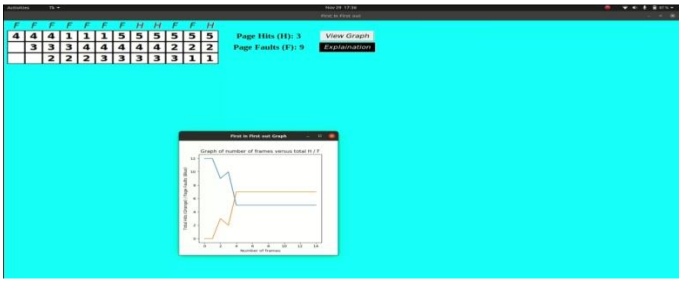
SNAPSHOT (FIFO)

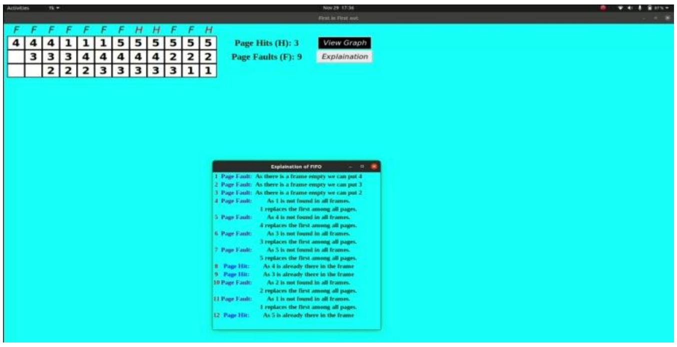


F	F	F	F	F	F	F	H	H	F	F	H
4	4	4	1	1	1	5	5	5	5	5	5
	3	3	3	4	4	4	4	4	2	2	2
		2	2	2	3	3	3	3	3	1	1

Page Hits (H): 3

Page Faults (F): 9

View Graph
Explaination
First in First out Graph
Graph of number of frames versus total H / F
Total Hits (Orange) / Page Faults (Blue)
12
10
8
6
4
2
0
0
2
4
6
8
10
12
14
Number of frames



F	F	F	F	F	F	F	H	H	F	F	H
4	4	4	1	1	1	5	5	5	5	5	5
	3	3	3	4	4	4	4	4	2	2	2
		2	2	2	3	3	3	3	3	1	1

Page Hits (H): 3

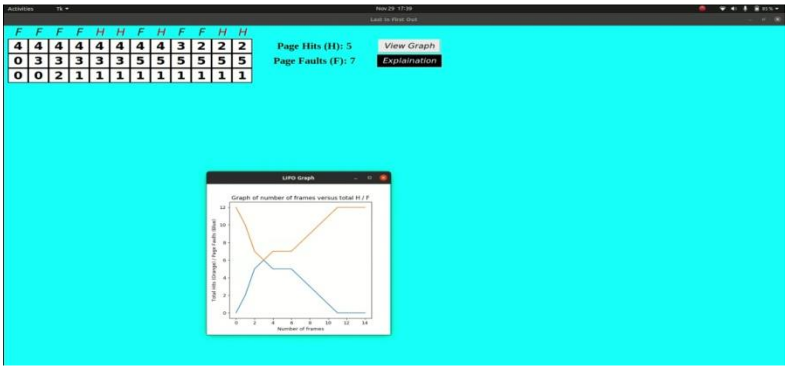
Page Faults (F): 9

```
1  Page Fault:  As there is a frame empty we can put 4
2  Page Fault:  As there is a frame empty we can put 3
3  Page Fault:  As there is a frame empty we can put 2
4  Page Fault:      As 1 is not found in all frames.
                 1 replaces the first among all pages.
5  Page Fault:      As 4 is not found in all frames.
                 4 replaces the first among all pages.
6  Page Fault:      As 3 is not found in all frames.
                 3 replaces the first among all pages.
7  Page Fault:      As 5 is not found in all frames.
                 5 replaces the first among all pages.
8   Page Hit:     As 4 is already there in the frame
9   Page Hit:     As 3 is already there in the frame
10 Page Fault:      As 2 is not found in all frames.
                 2 replaces the first among all pages.
11 Page Fault:      As 1 is not found in all frames.
                 1 replaces the first among all pages.
12  Page Hit:     As 5 is already there in the frame
```

FIFO (FIRST IN FIRST OUT)

IN FIFO, THE OPERATING SYSTEM KEEPS TRACK OF ALL PAGES IN THE MEMORY OF A QUEUE, THE OLDEST PAGE IS AT THE FRONT OF THE QUEUE.WHEN THE PAGE NEEDS TO BE REPLACED PAGE IN THE FRONT(OLDEST) OF THE QUEUE IS SELECTED FOR REMOVAL.

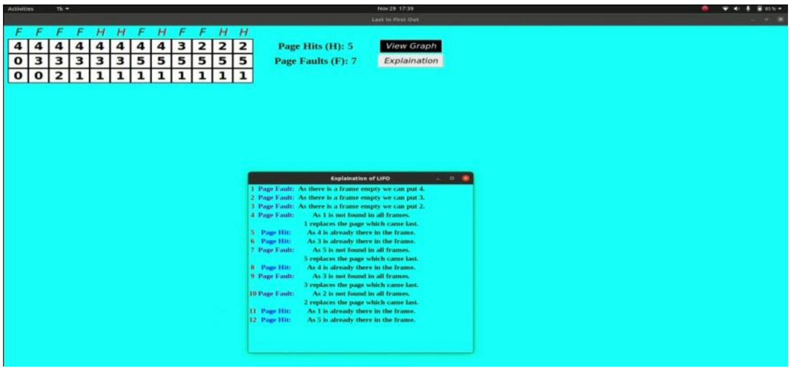
SNAPSHOT (LIFO)



F	F	F	F	H	H	F	H	F	F	H	H
4	4	4	4	4	4	4	4	3	2	2	2
0	3	3	3	3	3	5	5	5	5	5	5
0	0	2	1	1	1	1	1	1	1	1	1

Page Hits (H): 5

Page Faults (F): 7



F	F	F	F	H	H	F	H	F	F	H	H
4	4	4	4	4	4	4	4	3	2	2	2
0	3	3	3	3	3	5	5	5	5	5	5
0	0	2	1	1	1	1	1	1	1	1	1

Page Hits (H): 5

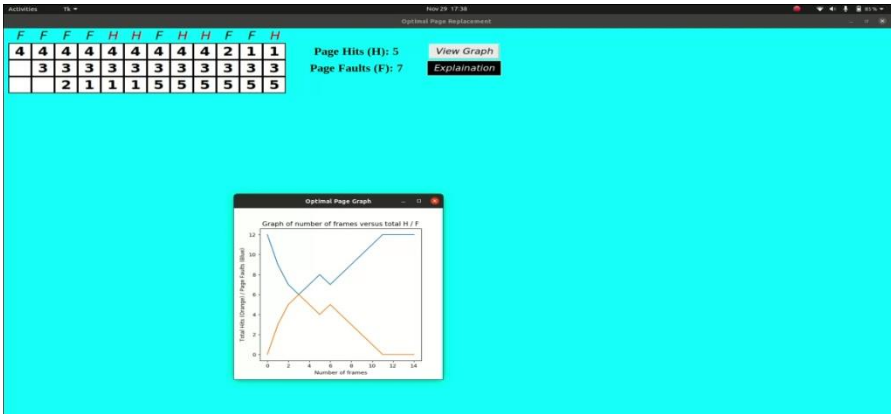
Page Faults (F): 7

1 Page Fault: As there is a frame empty we can put 4.
2 Page Fault: As there is a frame empty we can put 3.
3 Page Fault: As there is a frame empty we can put 2.
4 Page Fault: As 1 is not found in all frames.
1 replaces the page which came last.
5 Page Hit: As 4 is already there in the frame.
6 Page Hit: As 3 is already there in the frame.
7 Page Fault: As 5 is not found in all frames.
5 replaces the page which came last.
8 Page Hit: As 4 is already there in the frame.
9 Page Fault: As 3 is not found in all frames.
3 replaces the page which came last.
10 Page Fault: As 2 is not found in all frames.
2 replaces the page which came last.
11 Page Hit: As 1 is already there in the frame.
12 Page Hit: As 5 is already there in the frame.

LIFO (LAST IN FIRST OUT)

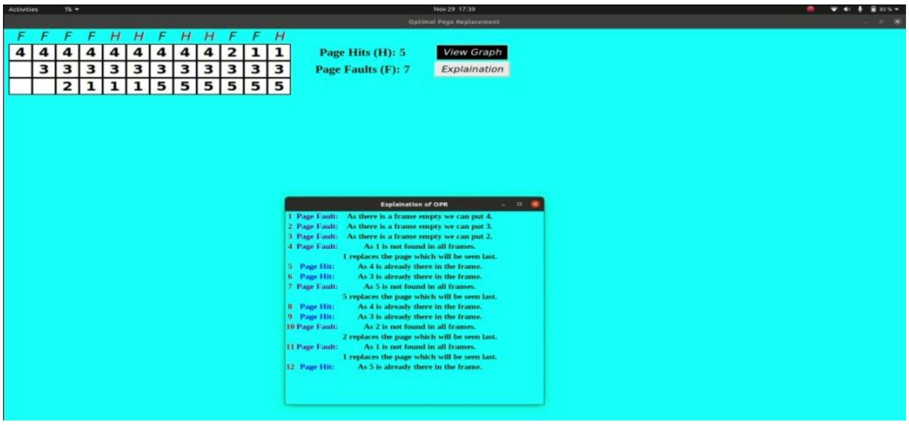
IN LIFO, THE OPERATING SYSTEM KEEPS TRACK OF ALL PAGES IN THE MEMORY OF A QUEUE.WHEN THE PAGE NEEDS TO BE REPLACED THE NEWEST PAGE IS SELECTED FOR REMOVAL.

SNAPSHOT (OPR)



F	F	F	F	H	H	F	H	H	F	F	H
4	4	4	4	4	4	4	4	4	2	1	1
	3	3	3	3	3	3	3	3	3	3	3
		2	1	1	1	5	5	5	5	5	5

Page Hits (H): 5
Page Faults (F): 7



F	F	F	F	H	H	F	H	H	F	F	H
4	4	4	4	4	4	4	4	4	2	1	1
	3	3	3	3	3	3	3	3	3	3	3
		2	1	1	1	5	5	5	5	5	5

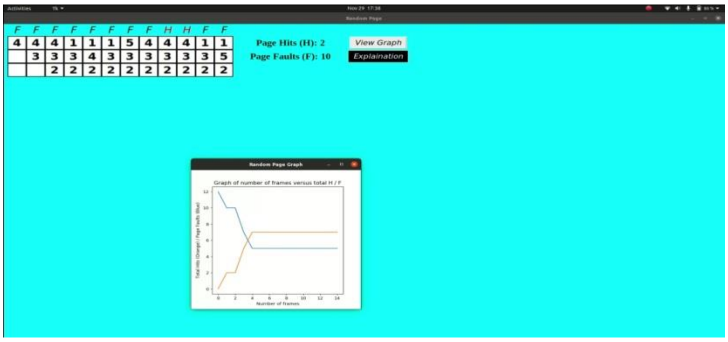
Page Hits (H): 5
Page Faults (F): 7

```
1 Page Fault:   As there is a frame empty we can put 4.
2 Page Fault:   As there is a frame empty we can put 3.
3 Page Fault:   As there is a frame empty we can put 2.
4 Page Fault:       As 1 is not found in all frames.
               1 replaces the page which will be seen last.
5  Page Hit:       As 4 is already there in the frame.
6  Page Hit:       As 3 is already there in the frame.
7 Page Fault:       As 5 is not found in all frames.
               5 replaces the page which will be seen last.
8  Page Hit:       As 4 is already there in the frame.
9  Page Hit:       As 3 is already there in the frame.
10 Page Fault:      As 2 is not found in all frames.
               2 replaces the page which will be seen last.
11 Page Fault:      As 1 is not found in all frames.
               1 replaces the page which will be seen last.
12 Page Hit:       As 5 is already there in the frame.
```

OPR (OPTIMAL PAGE REPLACEMENT)

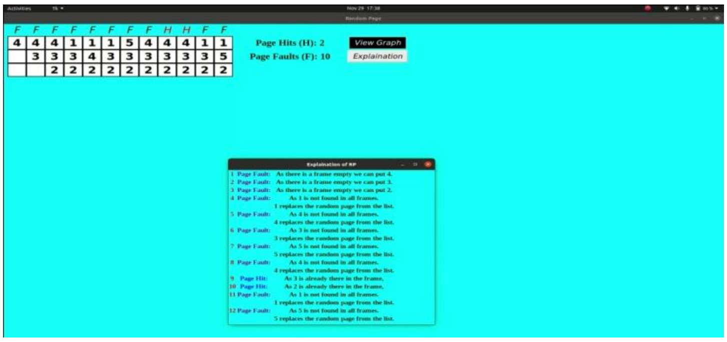
IN OPR, PAGES ARE REPLACED WHICH WOULS NOT TO BE USED FOR THE LONGEST DURATION OF TIME IN THE FUTURE.

SNAPSHOT (RP)



F	F	F	F	F	F	F	F	H	H	F	F
4	4	4	1	1	1	5	4	4	4	1	1
	3	3	3	4	3	3	3	3	3	3	5
		2	2	2	2	2	2	2	2	2	2

Page Hits (H): 2
Page Faults (F): 10



F	F	F	F	F	F	F	F	H	H	F	F
4	4	4	1	1	1	5	4	4	4	1	1
	3	3	3	4	3	3	3	3	3	3	5
		2	2	2	2	2	2	2	2	2	2

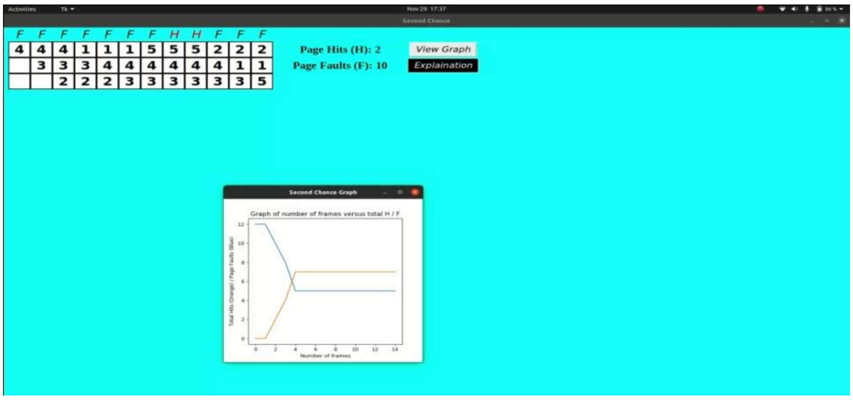
Page Hits (H): 2
Page Faults (F): 10

```
1 Page Fault:  As there is a frame empty we can put 4.
2 Page Fault:  As there is a frame empty we can put 3.
3 Page Fault:  As there is a frame empty we can put 2.
4 Page Fault:      As 1 is not found in all frames.
               1 replaces the random page from the list.
5 Page Fault:      As 4 is not found in all frames.
               4 replaces the random page from the list.
6 Page Fault:      As 3 is not found in all frames.
               3 replaces the random page from the list.
7 Page Fault:      As 5 is not found in all frames.
               5 replaces the random page from the list.
8 Page Fault:      As 4 is not found in all frames.
               4 replaces the random page from the list.
9  Page Hit:      As 3 is already there in the frame.
10 Page Hit:      As 2 is already there in the frame.
11 Page Fault:     As 1 is not found in all frames.
               1 replaces the random page from the list.
12 Page Fault:     As 5 is not found in all frames.
               5 replaces the random page from the list.
```

RP (RANDOM PAGE)

RANDOM PAGE REPLACEMENT ALGORITHM REPLACES A RANDOM PAGE INTO MEMORY. THIS ELIMINATES THE PAGE USING RANDOM FUNCTION. THE RANDOM FUNCTION GENERATE RANDOM NUMBER THAT NUMBER IS INDEX OF MEMORY FRAME AND FRAME INDEXED PAGE REPLACED WITH INSERTED PAGE.THIS ALGORITHM IS MORE EFFECTIVE IN MULTIPROCESSOR OPERATING SYSTEM.

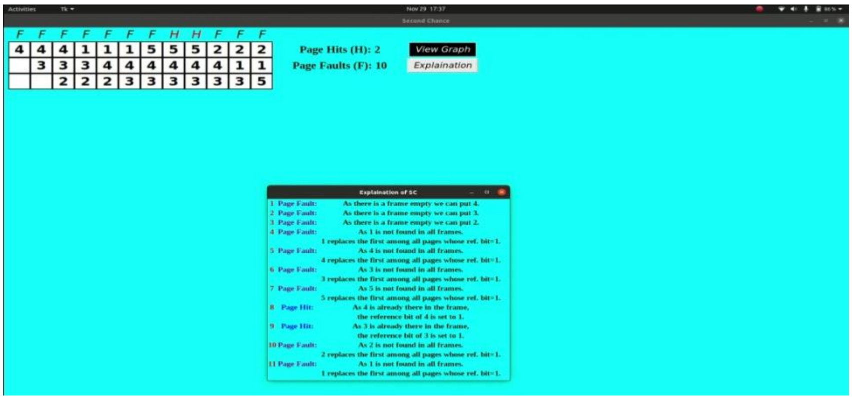
SNAPSHOT (SC)



F	F	F	F	F	F	F	H	H	F	F	F
4	4	4	1	1	1	5	5	5	2	2	2
	3	3	3	4	4	4	4	4	4	1	1
		2	2	2	3	3	3	3	3	3	5

Page Hits (H): 2

Page Faults (F): 10



F	F	F	F	F	F	F	H	H	F	F	F
4	4	4	1	1	1	5	5	5	2	2	2
	3	3	3	4	4	4	4	4	4	1	1
		2	2	2	3	3	3	3	3	3	5

Page Hits (H): 2

Page Faults (F): 10

1 Page Fault: As there is a frame empty we can put 4.
2 Page Fault: As there is a frame empty we can put 3.
3 Page Fault: As there is a frame empty we can put 2.
4 Page Fault: As 1 is not found in all frames.
1 replaces the first among all pages whose ref. bit=1.
5 Page Fault: As 4 is not found in all frames.
4 replaces the first among all pages whose ref. bit=1.
6 Page Fault: As 3 is not found in all frames.
3 replaces the first among all pages whose ref. bit=1.
7 Page Fault: As 5 is not found in all frames.
5 replaces the first among all pages whose ref. bit=1.
8 Page Hit: As 4 is already there in the frame,
the reference bit of 4 is set to 1.
9 Page Hit: As 3 is already there in the frame,
the reference bit of 3 is set to 1.
10 Page Fault: As 2 is not found in all frames.
2 replaces the first among all pages whose ref. bit=1.
11 Page Fault: As 1 is not found in all frames.
1 replaces the first among all pages whose ref. bit=1.

SC (SECOND CHANCE)

SECOND CHANCE PAGE REPLACEMENT ALGORITHM IS A SIMPLE MODIFICATION TO FIFO.

IN SC a "second chance" BIT IS ADDED TO EACH FRAME.

EACH TIME THE MEMORY FRAME IS REFRENCED, SET THE "second chance" BIT TO ONE(1).

THE NEW PAGE READ IN TO THE MEMORY FRAME HAS “second chance” BIT SET TO ZERO(0).

WHEN YOU NEED TO FIND A PAGE FOR REMOVAL, LOOK IN A ROUND ROBIN MANNER IN MEMORY FRAMES:

- ***IF BIT IS ONE, RESET IT TO ZERO AND CONTINUE.***
- ***IF BIT IS ZERO, REPLACE THE PAGE IN THAT MEMORY FRAME.***