

## **Nirbhay sharma (B19CSE114)**

### **Features:**

Implementation of page replacement algorithms from scratch in c++

FIFO page replacement algorithm, LRU page replacement algorithm, Optimal page replacement algorithm are implemented from scratch

### **How to run:**

- C++ should be installed in the computer
- To run the code open terminal and type the following command:
  - `g++ PageReplacement.cpp ;./a.out`

### **How to provide user input to the program**

- N -> number of times to test the algorithms
- For each N enter
  - F -> number of frame allocated to the process
  - Reference string -> this should be a space separated input of integers (that represents the page numbers)
  - Note that reference string can contain any number of pages

Sample input:

Frame -> 4

Ref str -> 1 2 3 2 1 5 2 1 6 2 5 6 3 1 3 6 1 2 4 3

### **Output will be:**

Represents the scenario of the the frames in the form of 0 1 0 1 etc where 1-> represents page hit and 0 represents page fault / miss for each page

The number of page faults

### **Belady's anomaly**

Simulation from a use case:

In theory we know that fifo has this belady's anomaly means that increase the number of frames also increases the page miss simulation for this is shown below with an example

```

enter number of frames : 3
enter reference string : 1 2 3 4 1 2 5 1 2 3 4 5
0 0 0 0 0 0 0 1 1 0 0 1
(fifo) miss are : 9
0 0 0 0 1 1 0 1 1 0 0 1
(opr) miss are : 7
0 0 0 0 0 0 0 1 1 0 0 0
(lru) miss are : 10

```

```

enter number of frames : 4
enter reference string : 1 2 3 4 1 2 5 1 2 3 4 5
0 0 0 0 1 1 0 0 0 0 0 0
(fifo) miss are : 10
0 0 0 0 1 1 0 1 1 1 0 1
(opr) miss are : 6
0 0 0 0 1 1 0 1 1 0 0 0
(lru) miss are : 8

```

Here we can clearly see that for fifo increasing the number of frames also increases the page miss from 9 to 10 also we can see that the belady's anomaly doesn't occur in case of lru and optimal page replacement