**CODE:-**

import java.util.Scanner;

public class OptimalPageReplacement {

public static void main(String[] args) {

Scanner sc = new Scanner(System.in);

int noofpages, capacity, ptr = 0, hit = 0, fault = 0;

boolean isFull=false;

double hitRatio,faultRatio;

System.out.print("Enter the number of pages you want to enter: ");

noofpages = sc.nextInt();

int pages[] = new int[noofpages];

for (int i = 0; i < noofpages; i++) {

pages[i] = sc.nextInt();

}

System.out.print("Enter the capacity of frame: ");

capacity = sc.nextInt();

int frame[] = new int[capacity];

int table[][] = new int[noofpages][capacity];

for (int i = 0; i < capacity; i++) {

frame[i] = -1;

}

System.out.println("----------------------------------------------------------------------");

for (int i = 0; i < noofpages; i++) {

int search = -1;

for (int j = 0; j < capacity; j++) {

if (frame[j] == pages[i]) {

search = j;

hit++;

System.out.printf("%4s","H");

break;

} }

if (search == -1) {

if (isFull) {

int[] index = new int[capacity];

boolean[] index\_flag = new boolean[capacity];

for (int j = i + 1; j < noofpages; j++) {

for (int k = 0; k < capacity; k++) {

if ((pages[j] == frame[k]) &&

(!index\_flag[k])) {

index[k] = j;

index\_flag[k] = true;

break;

} } }

int max = index[0];

ptr = 0;

if (max == 0)

max = 200;

for (int j = 0; j < capacity; j++) {

if (index[j] == 0)

index[j] = 200;

if (index[j] > max) {

max = index[j];

ptr = j;

} } }

frame[ptr] = pages[i];

fault++;

System.out.printf("%4s","F");

if (!isFull) {

ptr++;

if (ptr == capacity) {

ptr = 0;

isFull = true;

} } }

System.arraycopy(frame, 0, table[i], 0, capacity);

}

System.out.println("\n----------------------------------------------------------------------");

for (int i = 0; i < capacity; i++) {

for (int j = 0; j < noofpages; j++)

System.out.printf("%3d ", table[j][i]);

System.out.println();

}

System.out.println("----------------------------------------------------------------------");

hitRatio = ((double)hit / noofpages) \* 100;

faultRatio = ((double)fault / noofpages) \* 100;

System.out.println("Page Fault: " + fault + "\nPage Hit: " + hit);

System.out.printf("Hit Ratio:%.2f \nFault Ratio:%.2f ", hitRatio, faultRatio);

}}

**OUTPUT: -**

Enter the number of pages you want to enter: 13

7 0 1 2 0 3 0 4 2 3 0 3 2

Enter the capacity of frame: 4

----------------------------------------------------------------------

F F F F H F H F H H H H H

----------------------------------------------------------------------

7 7 7 7 7 3 3 3 3 3 3 3 3

-1 0 0 0 0 0 0 0 0 0 0 0 0

-1 -1 1 1 1 1 1 4 4 4 4 4 4

-1 -1 -1 2 2 2 2 2 2 2 2 2 2

----------------------------------------------------------------------

Page Fault: 6

Page Hit: 7

Hit Ratio:53.85

Fault Ratio:46.