SPOS Practical\Page Placement Strategy\OptimalPageReplacement.java

```java
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);

}
}

```