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\\Optimal replacement

import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
public class OptimalReplacement {
 public static void main(String[] args) throws IOException
 {
 BufferedReader br = new BufferedReader(new
InputStreamReader(System.in));
 int frames, pointer = 0, hit = 0, fault = 0,ref_len;
 boolean isFull = false;
 int buffer[];
 int reference[];
 int mem_layout[][];

 System.out.println("Please enter the number of Frames: ");
 frames = Integer.parseInt(br.readLine());

 System.out.println("Please enter the length of the Reference string:");
 ref_len = Integer.parseInt(br.readLine());

 reference = new int[ref_len];
 mem_layout = new int[ref_len][frames];
 buffer = new int[frames];
 for(int j = 0; j < frames; j++)
 buffer[j] = -1;

 System.out.println("Please enter the reference string: ");
 for(int i = 0; i < ref_len; i++)
 {
 reference[i] = Integer.parseInt(br.readLine());
 }
 System.out.println();
 for(int i = 0; i < ref_len; i++)
 {
 int search = -1;
 for(int j = 0; j < frames; j++)
 {
 if(buffer[j] == reference[i])
 {
 search = j;
 hit++;
 break;
 }
 }
 if(search == -1)
 {
 if(isFull)
 {
 int index[] = new int[frames];
 boolean index_flag[] = new boolean[frames];
 for(int j = i + 1; j < ref_len; j++)
 {
 for(int k = 0; k < frames; k++)
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{
if((reference[j] == buffer[k]) && (index_flag[k] == false))
{
index[k] = j;
index_flag[k] = true;
break;
}
}
}
int max = index[0];
pointer = 0;
if(max == 0)
max = 200;
for(int j = 0; j < frames; j++)
{
if(index[j] == 0)
index[j] = 200;
if(index[j] > max)
{
max = index[j];
pointer = j;
}
}
}
buffer[pointer] = reference[i];
fault++;
if(!isFull)
{
pointer++;
if(pointer == frames)
{
pointer = 0;
isFull = true;
}
}
}
for(int j = 0; j < frames; j++)
mem_layout[i][j] = buffer[j];
}

for(int i = 0; i < frames; i++)
{
for(int j = 0; j < ref_len; j++)
System.out.printf("%3d ",mem_layout[j][i]);
System.out.println();
}

System.out.println("The number of Hits: " + hit);
System.out.println("Hit Ratio: " + (float)((float)hit/ref_len));
System.out.println("The number of Faults: " + fault);
}

}
```