**Task 14: Write a program to calculate the number of page faults for a reference string using LRU page replacement algorithm (input Takes by user).**

Here's an example of the LRU page replacement algorithm in C:

#include <stdio.h>

#define SIZE 3 // Size of the page table

int isPageInMemory(int page, int pageTable[], int size) { for (int i = 0; i < size; i++) {

if (pageTable[i] == page) return 1;

}

return 0;

}

void lruPageReplacement(int referenceString[], int n, int pageTable[], int size) { int pageFaults = 0;

int counter = 0; // Counter to track the age of each page

int ages[size]; // Age of each page in the page table

for (int i = 0; i < size; i++) ages[i] = 0;

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

if (!isPageInMemory(referenceString[i], pageTable, size)) { int index = 0;

for (int j = 1; j < size; j++) { if (ages[j] < ages[index])

index = j;

}

pageTable[index] = referenceString[i]; ages[index] = counter++;

pageFaults++;

} else {

// If the page is already in memory, update its age for (int j = 0; j < size; j++) {

if (pageTable[j] == referenceString[i]) ages[j] = counter++;

}

}

// Display page table and ages after each reference printf("Page Table: ");

for (int j = 0; j < size; j++) { if (pageTable[j] == -1)

printf("[ ] "); else

printf("[%d] ", pageTable[j]);

}

printf("Ages: ");

for (int j = 0; j < size; j++) { printf("%d ", ages[j]);

}

printf("\n");

}

printf("Total Page Faults: %d\n", pageFaults);

}

int main() { int n;

printf("Enter the number of page references: "); scanf("%d", &n);

int referenceString[n];

printf("Enter the page reference string:\n");

for (int i = 0; i < n; i++)

scanf("%d", &referenceString[i]);

int pageTable[SIZE];

for (int i = 0; i < SIZE; i++) pageTable[i] = -1;

lruPageReplacement(referenceString, n, pageTable, SIZE);

return 0;

}

OutPut-

