14. Write a C program to illustrate the page replacement method where the page which is not in demand for the longest future time is replaced by the new page and determine the number of page faults for the following test case:

No. of page frames: 3; Page reference sequence 7,0,1,2,0,3,0,4,2,3,0,3,2,1,2,0,1,7,0 and 1.

C:\Users\hp\Documents\OPTIMAL PAGE REPLACEMENT ALGORITHM.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug

SINGLE LEVEL DIRECTORY,C.cpp | OPTIMAL PAGE REPLACEMENT ALGORITHM.cpp

```
1   #include<stdio.h>
2   int main()
3   {
4       int no_of_frames, no_of_pages, frames[10], pages[30], temp[10], flag1, flag2, flag3, i, j, k, pos, max, faults = 0;
5       printf("Enter number of frames: ");
6       scanf("%d", &no_of_frames);
7
8       printf("Enter number of pages: ");
9       scanf("%d", &no_of_pages);
10
11      printf("Enter page reference string: ");
12
13      for(i = 0; i < no_of_pages; ++i){
14          scanf("%d", &pages[i]);
15      }
16
17      for(i = 0; i < no_of_frames; ++i){
18          frames[i] = -1;
19      }
20
21      for(i = 0; i < no_of_pages; ++i){
22          flag1 = flag2 = 0;
23
24          for(j = 0; j < no_of_frames; ++j){
25              if(frames[j] == pages[i]){
26                  flag1 = flag2 = 1;
27                  break;
28              }
29          }
30
31          if(flag1 == 0){
32              for(j = 0; j < no_of_frames; ++j){
33                  if(frames[j] == -1){
34                      faults++;
35                      frames[j] = pages[i];
36                      flag2 = 1;
37                      break;
38                  }
39              }
40          }
```

Compiler Resources Compile Log Debug Find Results

Line: 77 Col: 10 Sel: 0 Lines: 89 Length: 2200 Insert Done parsing in 0.031 seconds

Type here to search

37°C Mostly sunny ENG 14:32 09-05-2023

C:\Users\hp\Documents\OPTIMAL PAGE REPLACEMENT ALGORITHM.cpp - [Executing] - Dev-C++ 5.11

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(globals)

TDM-GCC 4.9.2 64-bit Release

oject Classes Debug

SINGLE LEVEL DIRECTORY,C.cpp | OPTIMAL PAGE REPLACEMENT ALGORITHM.cpp

```
40          }
41
42          if(flag2 == 0){
43           flag3 =0;
44
45              for(j = 0; j < no_of_frames; ++j){
46               temp[j] = -1;
47
48               for(k = i + 1; k < no_of_pages; ++k){
49               if(frames[j] == pages[k]){
50               temp[j] = k;
51               break;
52               }
53               }
54              }
55
56              for(j = 0; j < no_of_frames; ++j){
57               if(temp[j] == -1){
58               pos = j;
59               flag3 = 1;
60               break;
61               }
62              }
63
64              if(flag3 ==0){
65               max = temp[0];
66               pos = 0;
67
68               for(j = 1; j < no_of_frames; ++j){
69               if(temp[j] > max){
70               max = temp[j];
71               pos = j;
72               }
73               }
74              }
75  frames[pos] = pages[i];
76  faults++;
77          }
78
79          printf("\n");
```

Compiler Resources Compile Log Debug Find Results

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C:\Users\hp\Documents\OPTIMAL PAGE REPLACEMENT ALGORITHM.cpp - [Executing] - Dev-C++ 5.11

File Edit Search View Project Execute Tools AStyle Window Help

(globals)

TDM-GCC 4.9.2 64-bit Release

Project Classes Debug

SINGLE LEVEL DIRECTORY,C.cpp | OPTIMAL PAGE REPLACEMENT ALGORITHM.cpp

```
50                  temp[j] = k;
51                  break;
52                  }
53                  }
54                 }
55
56                 for(j = 0; j < no_of_frames; ++j){
57                  if(temp[j] == -1){
58                  pos = j;
59                  flag3 = 1;
60                  break;
61                  }
62                 }
63
64                 if(flag3 ==0){
65                  max = temp[0];
66                  pos = 0;
67
68                  for(j = 1; j < no_of_frames; ++j){
69                  if(temp[j] > max){
70                  max = temp[j];
71                  pos = j;
72                  }
73                  }
74                 }
75  frames[pos] = pages[i];
76  faults++;
77          }
78
79          printf("\n");
80
81          for(j = 0; j < no_of_frames; ++j){
82              printf("%d\t", frames[j]);
83          }
84      }
85
86      printf("\n\nTotal Page Faults = %d", faults);
87
88      return 0;
89  }
```

Compiler | Resources | Compile Log | Debug | Find Results

Line: 6 Col: 32 Sel: 0 Lines: 89 Length: 2200 Insert Done parsing in 0.031 seconds

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37°C Mostly sunny ENG 14:33 09-05-2023

```
C:\Users\hp\Documents\OPTIMAL PAGE REPLACEMENT ALGORITHM.exe
Enter number of frames: 3
Enter number of pages: 20
Enter page reference string: 7 0 1 2 0 3 0 4 2 3 0 3 2 1 2 0 1 7 0 1

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

Total Page Faults = 9
--------------------------------
Process exited after 49.7 seconds with return value 0
Press any key to continue . . .
```