

Page Replacement Algorithms

Anawil C ID: 5912087

FIFO

Language: Editor: Layout:

```
1 #FIFO
2
3
4 ListofNum = [int(x) for x in input('List of Numbers: ')]
5
6 n = len(ListofNum)
7 m = int(input("Number of Frame: "))
8 x = 0
9
10 pageFaults = 0
11 page = []
12 isNull = -1
13
14
15 for i in range(m):
16     page.append(isNull)
17
18
19 for i in range(n):
20     F = 0
21     for j in range(m):
22         if page[j] == ListofNum[i]:
23             F = 1
24             break
25
26     if F == 0:
27         isFault = False
28         newSlot = isNull
29         for q in range(m):
30             if page[q] == isNull:
31                 isFault = True
32                 newSlot = q
33
34     if not isFault:
35         maxNext = 0
36         maxNextNode = isNull
37         for q in range(m):
```

Language: Python 3 ▾ Editor: CodeMirror ▾ Layout: Vertical ▾

```
34     if not isFault:
35         maxNext = 0
36         maxNextNode = isNull
37         for q in range(m):
38             if page[q] != isNull:
39                 found = False
40                 for z in range(i, n):
41                     if ListofNum[z] == page[q]:
42                         found = True
43                         if z > maxNext:
44                             maxNext = z
45                             maxNextNode = q
46
47                         break
48
49                 if not found:
50                     maxNextNode = q
51                     break
52
53         isFault = True
54         newSlot = maxNextNode
55
56     pageFaults += 1
57     page[newSlot] = ListofNum[i]
58     print("\n")
59     print("%d ->" % (ListofNum[i]))
60     for j in range(m):
61         if page[j] != isNull:
62             print(page[j])
63         else:
64             print("[ ]")
65     else:
66         print("\n")
67         print("%d -> No Page Fault." % (ListofNum[i]))
68     print("\n")
69     print("Total page faults : %d " % (pageFaults - m))
70
```

List of Numbers: Number of I

2 ->
[]
[]
2

Total page faults : -2

3 ->
[]
3
2

Total page faults : -1

2 -> No Page Fault.

Total page faults : -1

1 ->
1
3
2

Total page faults : 0

5 ->
5
3
2

Test(Result)

input

232152453252
3

Test(Result)

Total page faults : 1

2 -> No Page Fault.

Total page faults : 1

4 ->

5

3

4

input

232152453252
3

LRU

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Code

Language: Editor: Layout:

```
1 #LRU
2
3
4 ListofNum = [int(x) for x in input('List of Number: ')]
5
6 print("\n")
7
8 n = len(ListofNum)
9 m = int(input("Number of Frames: "))
10 x = 0
11 pageFaults = 0
12 page = []
13
14
15 for i in range(m):
16     page.append(-1)
17
18
19 for i in range(n):
20     F = 0
21     for j in range(m):
22         if page[j] == ListofNum[i]:
23             F = 1
24             break
25
26     if F == 0:
27         if page[x] != -1:
28             min = 999
29             for k in range(m):
30                 F = 0
31                 j = i
32                 while j >= 0:
33                     j -= 1
34                     if page[k] == ListofNum[j]:
35                         F = 1
36                         break
37                 if F == 1 and min > j:
```


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Language: Editor: Layout:

```
23         F = 1
24         break
25
26     if F == 0:
27         if page[x] != -1:
28             min = 999
29             for k in range(m):
30                 F = 0
31                 j = i
32                 while j >= 0:
33                     j -= 1
34                     if page[k] == ListofNum[j]:
35                         F = 1
36                         break
37                 if F == 1 and min > j:
38                     min = j
39                     x = k
40
41     page[x] = ListofNum[i]
42     x = (x + 1) % m
43     pageFaults += 1
44     print("\n")
45     print("%d ->" % (ListofNum[i]))
46     for j in range(m):
47         if page[j] != -1:
48             print(page[j])
49         else:
50             print("[ ]")
51     else:
52         print("\n")
53         print("\n%d -> No Page Fault." % (ListofNum[i]))
54     print("\n")
55     print("Total page faults : %d" % (pageFaults - m))
56
57 #input test
58 #232152453252
59 #3
```

Code(Con.)

List of Number:

Number of Frames:

2 ->
2
[]
[]

Total page faults : -2

3 ->
2
3
[]

Total page faults : -1

2 -> No Page Fault.

Total page faults : -1

1 ->
2
3
1

Total page faults : 0

5 ->
2
5
1

Test(Result)

input

232152453252
3

Total page faults : 1

4 ->
2
5
4

Total page faults : 2

5 -> No Page Fault.

Total page faults : 2

3 ->
3
5
4

Total page faults : 3

2 ->
3
5
2

Total page faults : 4

5 -> No Page Fault.

Test(Con.)

input

232152453252
3

Test(Con.)

5 -> No Page Fault.

Total page faults : 4

2 -> No Page Fault.

Total page faults : 4

input

232152453252
3

Optimal

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Code

Language: Editor: Layout:

```
1 #Optimal
2
3 ListofNum = [int(x) for x in input('List of Numbers: ')]
4
5 print("\n")
6
7 n = len(ListofNum)
8 m = int(input("Number of Frames: "))
9
10 isNull = -1
11 pageFaults = 0
12 page = []
13
14 for i in range(m):
15     page.append(isNull)
16
17
18 for i in range(n):
19     flag = 0
20     for j in range(m):
21         if page[j] == ListofNum[i]:
22             flag = 1
23             break
24
25     if flag == 0:
26         isNull = (isNull + 1) % m
27         page[isNull] = ListofNum[i]
28         pageFaults += 1
29         print("\n")
30         print("%d ->" % (ListofNum[i]))
31         for j in range(m):
32             if page[j] != -1:
33                 print(page[j])
34             else:
35                 print("[ ]")
36     else:
37         print("\n")
38         print("%d -> No Page Fault " % (ListofNum[i]))
```

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Language: Editor: Layout:

```
7 n = len(ListofNum)
8 m = int(input("Number of Frames: "))
9
10 isNull = -1
11 pageFaults = 0
12 page = []
13
14 for i in range(m):
15     page.append(isNull)
16
17
18 for i in range(n):
19     flag = 0
20     for j in range(m):
21         if page[j] == ListofNum[i]:
22             flag = 1
23             break
24
25     if flag == 0:
26         isNull = (isNull + 1) % m
27         page[isNull] = ListofNum[i]
28         pageFaults += 1
29         print("\n")
30         print("%d ->" % (ListofNum[i]))
31         for j in range(m):
32             if page[j] != -1:
33                 print(page[j])
34             else:
35                 print("[ ]")
36     else:
37         print("\n")
38         print("%d -> No Page Fault." % (ListofNum[i]))
39     print("\n")
40     print("\n Total page faults : %d" % (pageFaults - m))
41
42 #input test
43 #232152453252
44 #3
```

Code(Con.)

List of Numbers:

Number of Frames:

2 ->
2
[]
[]

Total page faults : -2

3 ->
2
3
[]

Total page faults : -1

2 -> No Page Fault.

Total page faults : -1

1 ->
2
3
1

Test(Result)

input

232152453252
3

Test(Con.)

Total page faults : 0

5 ->
5
3
1

Total page faults : 1

2 ->
5
2
1

Total page faults : 2

4 ->
5
2
4

input

232152453252
3

Test(Con.)

input

Total page faults : 3

5 -> No Page Fault.

Total page faults : 3

3 ->
3
2
4

Total page faults : 4

2 -> No Page Fault.

232152453252
3

Test(Con.)

Total page faults : 4

5 ->
3
5
4

Total page faults : 5

2 ->
3
5
2

Total page faults : 6

input

232152453252
3