Noman Ahmed
DT-22032

Operating System
(CT-353)

Lab no 12

Noman Ahmed
DT-22032

Implement the above code and paste the screen shot of the output.

CODE:

A) FIFO

```
#include <stdio.h>
#include <conio.h>

int main() {
   int i, j, k, f, pf = 0, count = 0, rs[25], m[10], n;
   clrscr();

   printf("\nEnter the length of reference string: ");
   scanf("%d", &n);

   printf("Enter the reference string: ");
   for (i = 0; i < n; i++)
      scanf("%d", &rs[i]);

   printf("Enter number of frames: ");
   scanf("%d", &f);
```

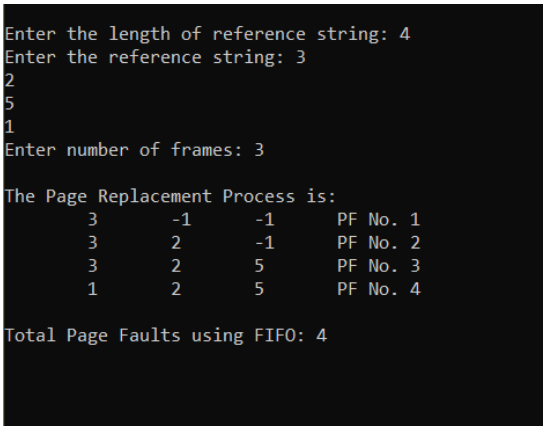
Noman Ahmed
DT-22032

```
   for (i = 0; i < f; i++) m[i] = -1;


   printf("\nThe Page Replacement Process is:\n");
   for (i = 0; i < n; i++) {
      for (k = 0; k < f; k++) {
         if (m[k] == rs[i]) break;
      }

      if (k == f) {
         m[count++] = rs[i];
         pf++;
      }

      for (j = 0; j < f; j++)
         printf("\t%d", m[j]);

      if (k == f)
         printf("\tPF No. %d", pf);
      printf("\n");

      if (count == f) count = 0;
   }
```

Noman Ahmed
DT-22032

```
    printf("\nTotal Page Faults using FIFO: %d\n", pf);
    getch();
    return 0;
}
```

OUTPUT:



B) LRU

```
#include <stdio.h>
#include <conio.h>

int main() {
    int i, j, k, min, rs[25], m[10], count[10], flag[25], n, f, pf = 0, next = 1;
    clrscr();

    printf("Enter the length of reference string: ");
```

Noman Ahmed
DT-22032

```
   scanf("%d", &n);

   printf("Enter the reference string: ");
   for (i = 0; i < n; i++) {
      scanf("%d", &rs[i]);
      flag[i] = 0;
   }

   printf("Enter number of frames: ");
   scanf("%d", &f);

   for (i = 0; i < f; i++) {
      count[i] = 0;
      m[i] = -1;
   }

   printf("\nThe Page Replacement Process is:\n");
   for (i = 0; i < n; i++) {
      for (j = 0; j < f; j++) {
         if (m[j] == rs[i]) {
            flag[i] = 1;
            count[j] = next++;
```

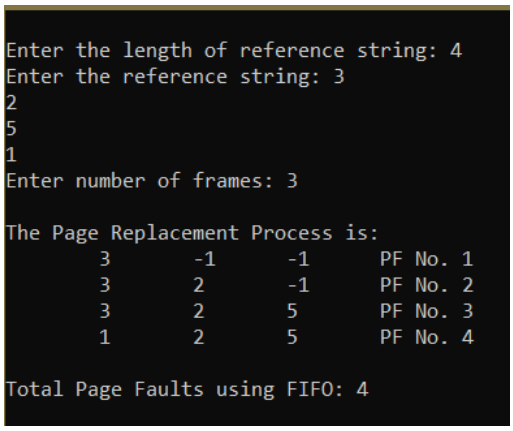
Noman Ahmed
DT-22032

```
        }
    }


    if (flag[i] == 0) {
        if (i < f) {
            m[i] = rs[i];
            count[i] = next++;
        } else {
            min = 0;
            for (j = 1; j < f; j++)
                if (count[min] > count[j])
                    min = j;
            m[min] = rs[i];
            count[min] = next++;
        }
        pf++;
    }


    for (j = 0; j < f; j++)
        printf("%d\t", m[j]);
    if (flag[i] == 0)
        printf("PF No. -- %d", pf);
```

Noman Ahmed
DT-22032

```
        printf("\n");
    }


    printf("\nTotal Page Faults using LRU: %d\n", pf);
    getch();
    return 0;
}
```

OUTPUT:



C) OPTIMAL Page Replacement

```
#include <stdio.h>


int main() {
    int no_of_frames, no_of_pages, frames[10], pages[30], temp[10];
    int flag1, flag2, flag3, i, j, k, pos, max, faults = 0;
```

Noman Ahmed
DT-22032

```
   printf("Enter number of frames: ");
   scanf("%d", &no_of_frames);

   printf("Enter number of pages: ");
   scanf("%d", &no_of_pages);

   printf("Enter page reference string: ");
   for (i = 0; i < no_of_pages; ++i)
      scanf("%d", &pages[i]);

   for (i = 0; i < no_of_frames; ++i)
      frames[i] = -1;

   for (i = 0; i < no_of_pages; ++i) {
      flag1 = flag2 = 0;

      for (j = 0; j < no_of_frames; ++j) {
         if (frames[j] == pages[i]) {
            flag1 = flag2 = 1;
            break;
         }
      }
```

Noman Ahmed
DT-22032

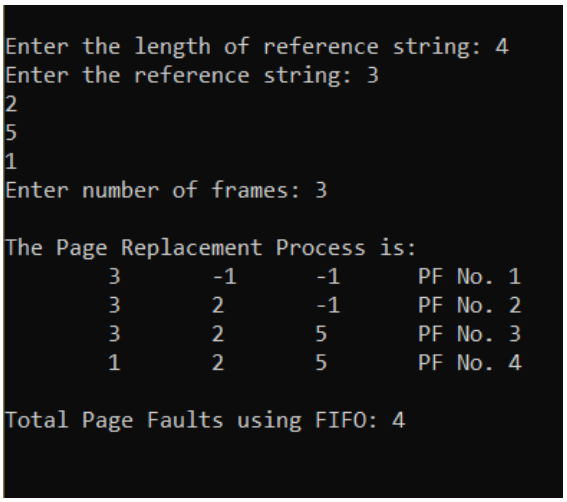
```
    if (flag1 == 0) {
        for (j = 0; j < no_of_frames; ++j) {
            if (frames[j] == -1) {
                frames[j] = pages[i];
                faults++;
                flag2 = 1;
                break;
            }
        }
    }

    if (flag2 == 0) {
        flag3 = 0;
        for (j = 0; j < no_of_frames; ++j) {
            temp[j] = -1;
            for (k = i + 1; k < no_of_pages; ++k) {
                if (frames[j] == pages[k]) {
                    temp[j] = k;
                    break;
                }
            }
```

```
        }

        for (j = 0; j < no_of_frames; ++j) {
           if (temp[j] == -1) {
              pos = j;
              flag3 = 1;
              break;
           }
        }

        if (flag3 == 0) {
           max = temp[0];
           pos = 0;
           for (j = 1; j < no_of_frames; ++j) {
              if (temp[j] > max) {
                 max = temp[j];
                 pos = j;
              }
           }
        }

        frames[pos] = pages[i];
```

Noman Ahmed
DT-22032

```
            faults++;
        }


        for (j = 0; j < no_of_frames; ++j)
            printf("%d\t", frames[j]);
        printf("\n");
    }


    printf("\nTotal Page Faults using OPTIMAL: %d\n", faults);
    return 0;
}
```

OUTPUT:



Noman Ahmed
DT-22032

D) MRU

```
#include <iostream>

using namespace std;


// Update array in MRU fashion

void recently(int* arr, int size, int elem) {

   int index = elem % size;

   int temp = index, id = arr[index];


   while (temp > 0)

      arr[temp] = arr[--temp];


   arr[0] = id;

}


// Print array

void print(int* arr, int size) {

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

      cout << arr[i] << " ";

   cout << endl;

}
```

Noman Ahmed
DT-22032

```
int main() {
    int elem = 3;
    int arr[] = {6, 1, 9, 5, 3};
    int size = sizeof(arr) / sizeof(arr[0]);

    recently(arr, size, elem);
    cout << "Array in Most Recently Used fashion: ";
    print(arr, size);

    return 0;
}
```

OUTPUT: