**Assignment no.** 6

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Implement the C program for Page replacement algorithm:

**FCFS**, **LRU** and **Optimal** for frame size as minimum three

// Roll number= T21279

#include<stdio.h> #include <cstdlib>

void FIFO(char [],char [],int,int);

void lru(char [],char [],int,int);

void opt(char [],char [],int,int); int main()

{

int ch,YN=1,i,l,f; char F[10],s[25];

printf("\n\n\tEnter the no of empty frames: "); scanf("%d",&f);

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

printf("\n\n\tEnter the string: "); scanf("%s",s);

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

do

{

printf("\n\n\t########## MENU ##########");

printf("\n\n\t1:FIFO\n\n\t2:LRU\n\n\t3:OPT\n\n\t4:EXIT"); printf("\n\n\tEnter your choice: ");

scanf("%d",&ch);

switch(ch)

{

case 1:

for(i=0;i<f;i++)

{

F[i]=-1;

}

case 2:

FIFO(s,F,l,f);

break;

for(i=0;i<f;i++)

{

F[i]=-1;

}

case 3:

lru(s,F,l,f); break;

for(i=0;i<f;i++)

{

F[i]=-1;

}

case 4:

}

opt(s,F,l,f); break;

exit(0);

printf("\n\n\tTo continue press 1\n\n\t to exit press 0 : "); scanf("%d",&YN);

}while(YN==1);return(0);

}

//First in first out

void FIFO(char s[],char F[],int l,int f)

{

int i,j=0,k,flag=0,cnt=0; printf("\n\tPAGE\t FRAMES\t FAULTS"); for(i=0;i<l;i++)

{

for(k=0;k<f;k++)

{

if(F[k]==s[i]) flag=1;

}

if(flag==0)

{

printf("\n\t%c\t",s[i]); F[j]=s[i];

j++;

for(k=0;k<f;k++)

{

printf(" %c",F[k]);

}

printf("\tPage-fault%d",cnt); cnt++;

}

else

{

flag=0; printf("\n\t%c\t",s[i]); for(k=0;k<f;k++)

{

printf(" %c",F[k]);

}

printf("\tNo page-fault");

}

if(j==f) j=0;

}

}

//least recently used

void lru(char s[],char F[],int l,int f)

{

int i,j=0,k,m,flag=0,cnt=0,top=0; printf("\n\tPAGE\t FRAMES\t FAULTS"); for(i=0;i<l;i++)

{

for(k=0;k<f;k++)

{

if(F[k]==s[i])

{

flag=1; break;

}

}

printf("\n\t%c\t",s[i]); if(j!=f && flag!=1)

{

F[top]=s[i]; j++;

if(j!=f) top++;

}

else

{

if(flag!=1)

{

for(k=0;k<top;k++)

{

F[k]=F[k+1];

}

F[top]=s[i];

}

if(flag==1)

{

for(m=k;m<top;m++)

{

F[m]=F[m+1];

}

F[top]=s[i];

}

}

for(k=0;k<f;k++)

{

printf(" %c",F[k]);

}

if(flag==0)

{

printf("\tPage-fault%d",cnt); cnt++;

}

else

printf("\tNo page fault"); flag=0;

}

}

//optimal

void opt(char s[],char F[],int l,int f)

{

int i,j=0,k,m,flag=0,cnt=0,temp[10];

printf("\n\tPAGE\t FRAMES\t FAULTS"); for(i=0;i<10;i++)

temp[i]=0;

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

for(i=0;i<l;i++)

{

for(k=0;k<f;k++)

{

if(F[k]==s[i]) flag=1;

}

if(j!=f && flag==0)

{

F[j]=s[i];

j++;

}

else if(flag==0)

{

for(m=0;m<f;m++)

{

for(k=i+1;k<l;k++)

{

if(F[m]!=s[k])

{

temp[m]=temp[m]+1;

}

else break;

}

}

m=0;

for(k=0;k<f;k++)

{

if(temp[k]>temp[m])

{

m=k;

}

}

F[m]=s[i];

}

printf("\n\t%c\t",s[i]); for(k=0;k<f;k++)

{

printf(" %c",F[k]);

}

if(flag==0)

{

printf("\tPage-fault %d",cnt); cnt++;

}

else

printf("\tNo Page-fault"); flag=0;

for(k=0;k<10;k++) temp [k]=0;

}

}

# E:\assignment\Madiha\OS\page replacment>gcc replace.cpp -o replace

E:\assignment\Madiha\OS\page replacment>replace

Enter the no of empty frames: 3

Enter the length of the string: 10

Enter the string: 6784879611

########## MENU ##########

1:First in First out

2:Least recently used

3:Optimal

4:EXIT

Enter your choice: 1

PAGE FRAMES FAULTS

|  |  |  |
| --- | --- | --- |
| 6 | 6 | Page-fault0 |
| 7 | 6 | 7 Page-fault1 |
| 8 | 6 | 7 8 Page-fault2 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 4 | 4 | 7 | 8 | Page-fault3 |
| 8 | 4 | 7 | 8 | No page-fault |
| 7 | 4 | 7 | 8 | No page-fault |
| 9 | 4 | 9 | 8 | Page-fault4 |
| 6 | 4 | 9 | 6 | Page-fault5 |
| 1 | 1 | 9 | 6 | Page-fault6 |
| 1 | 1 | 9 | 6 | No page-fault |

To continue press 1

to exit press 0 : 1

########## MENU ##########

1:First in First out

2:Least recently used

3:Optimal

4:EXIT

Enter your choice: 2

PAGE FRAMES FAULTS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6 | 6 Page-fault0 | | | |
| 7 | 6 | 7 |  | Page-fault1 |
| 8 | 6 | 7 | 8 | Page-fault2 |
| 4 | 7 | 8 | 4 | Page-fault3 |
| 8 | 7 | 4 | 8 | No page fault |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 7 | 4 | 8 | 7 | No page fault |
| 9 | 8 | 7 | 9 | Page-fault4 |
| 6 | 7 | 9 | 6 | Page-fault5 |
| 1 | 9 | 6 | 1 | Page-fault6 |
| 1 | 9 | 6 | 1 | No page fault |

To continue press 1

to exit press 0 : 1

########## MENU ##########

1:First in First out

2:Least recently used

3:Optimal

4:EXIT

Enter your choice: 3

PAGE FRAMES FAULTS

|  |  |  |
| --- | --- | --- |
| 6 | 6 | Page-fault 0 |
| 7 | 6 7 | Page-fault 1 |
| 8 | 6 7 8 | Page-fault 2 |
| 4 | 4 7 8 | Page-fault 3 |
| 8 | 4 7 8 | No Page-fault |
| 7 | 4 7 8 | No Page-fault |
| 9 | 9 7 8 | Page-fault 4 |
| 6 | 6 7 8 | Page-fault 5 |

|  |  |  |
| --- | --- | --- |
| 1 | 1 7 8 | Page-fault 6 |
| 1 | 1 7 8 | No Page-fault |

To continue press 1

to exit press 0 : 1

########## MENU ##########

1:First in First out

2:Least recently used

3:Optimal

4:EXIT

Enter your choice: 4

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