Consider the following page reference string:
7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2, 3, 0, 1
Assuming demand paging with three frames, write C programs that implement calculation of the number of page faults that would occur for the following replacement algorithms:

1. LRU
2. FIFO

FIFO Code:

```
#include<stdio.h>

void main()

{

int i,j,page[20]={ 7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2, 3, 0, 1 };
int flag1=0,flag2=0,pf=0,frsize=3,top=0;
for(i=0;i<3;i++)
{
fr[i]=-1;
}
for(j=0;j<20;j++)
{
flag1=0;
flag2=0;
for(i=0;i<20;i++)
{
if(fr[i]==page[j])
{
flag1=1;
flag2=1;
break;
}
}
if(flag1==0)
{
for(i=0;i<frsize;i++)
{
if(fr[i]==-1)
{
fr[i]=page[j];
flag2=1;
break;
}
```

```
}
}
if(flag2==0)
{
fr[top]=page[j];
top++;
pf++;
if(top>=frsize)
top=0;
}
display();
}
printf(“number of page faults:%d”,pf+frsize);
}
void display()
{
int i;
printf(“\n”);
for(i=0;i<3;i++)
printf(“%d\t”,fr[i]);
}
```

LRU Code:

```
#include<stdio.h>

void main()

{

int i,j,page[20]={ 7, 2, 3, 1, 2, 5, 3, 4, 6, 7, 7, 1, 0, 5, 4, 6, 2, 3, 0, 1 };
int flag1=0,flag2=0,pf=0,frsize=3;
int fs[3],index,k,l;
int fr[3];
for(i=0;i<3;i++)
{
fr[i]=-1;
}
for(j=0;j<20;j++)
{
flag1=0;
flag2=0;
for(i=0;i<3;i++)
{
if(fr[i]==page[j])
{
flag1=1;
flag2=1;
break;
}
}
if(flag1==0)
{
for(i=0;i<3;i++)
{
if(fr[i]==-1)
{
fr[i]=page[j];
flag2=1;
break;
}
}
}
```

```
if(flag2==0)
{
for(i=0;i<3;i++)
fs[i]=0;
for(k=j-1,l=1;l<=frsize-1;l++,k--)
{
for(i=0;i<3;i++)
{
if(fr[i]==page[k])
fs[i]=1;
}
}
for(i=0;i<3;i++)
{
if(fs[i]==0)
index=i;
}
fr[index]=page[j];
pf++;
}
display();
}
printf("\n no of page faults:%d",pf+frsize);
}
```

```
void display()
{
int i;
printf(“\n”);
for(i=0;i<3;i++)
printf(“%d\t”,fr[i]);
}
```