Assignment No.04

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Practical Name :Operations on Processes
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Que.1)Write the simulation program to implement demand paging and show the page scheduling and total number of page faults for the following given page reference string. Give input n as the number of memory frames.
Reference String : 12,15,12,18,6,8,11,12,19,12,6,8,12,15,19,8
1) Implement FIFO
2) Implement LRU
Ans :-
1) Implement FIFO

```
Program:- #include<stdio.h>
int prs[20],frm[10]={0};
int m[50][50];
int tp,tf,totpf=0,currp=0,currf=0;
int i,j,pf;

int chkpgfault()
{
   for(i=0;i<tf;i++){
      if(frm[i] == prs[currp])
      {
         break;
      }
   }
   if(i == tf)
   {
      return -1;
   }
   else
   {
      return i;
   }
}

void displayFrame()
{
   for(i=0;i<tf;i++)
   {
      m[currp][i] = frm[i];
   }

}
void main()
{
   printf("How many Page References String : ");
   scanf("%d",&tp);

   printf("Enter Page References String :\n");
   for(i=0;i<tp;i++)
   {
      scanf("%d",&prs[i]);
   }

   printf("How many Frames : ");
   scanf("%d",&tf);

   while (currp<tp)
   {
      pf= chkpgfault();
      if (pf == -1)
      {
         totpf++;
         frm[currf] = prs[currp];
         currf++;

         if(currf == tf)
            currf = 0;
      }
      displayFrame();
      currp++;
   }

   printf("\n  Frames \n");
   for(i=0;i<tf;i++)
   {
      for(j=0;j<tp;j++)
         {
            printf("%d ",m[j][i]);
         }

         printf("\n");
   }

   printf("\nTotal Page Fault : %d",totpf);
}
```

Output:

```
How many Page References String : 16
Enter Page References String :
12 15 12 18 6 8 11 12 19 12 6 8 12 145 19 8
How many Frames : 3

 Frames
12 12 12 12 6 6 6 12 12 12 12 8 8 8 19 19
0 15 15 15 15 8 8 8 19 19 19 19 12 12 12 8
0 0 0 18 18 18 11 11 11 11 6 6 6 145 145 145

Total Page Fault : 14
```

2) Implement LRU

Program:-

```
         #include<stdio.h>
int prs[20],frm[10]={0};
int m[50][50];
int tp,tf,totpf=0,currp=0,currf=0;
int i,j,pf,max,frmno,cnt;
int chkpgfault()
{
   for(i=0;i<tf;i++){
      if(frm[i] == prs[currp])
      {
         break;
      }
   }
   if(i == tf)
   {
      return -1;
   }
   else
   {
      return i;
   }
}

void displayFrame()
{
   for(i=0;i<tf;i++)
   {
      m[currp][i] = frm[i];
   }

}
int nextFrame()
{
   max = 0;
   frmno = 0;
   for(i=0;i<tf;i++)
   {
      cnt = 0;
      for(j=currp-1;j>=0;j--)
      {
         if(frm[i] == prs[j])
            break;
         else
            cnt++;
      }

      if (max<cnt)
      {
         max = cnt;
         frmno = i;
      }
   }
   return frmno;
}

void main()
{
   printf("How many Page References String : ");
   scanf("%d",&tp);

   printf("Enter Page References String :\n");
   for(i=0;i<tp;i++)
   {
      scanf("%d",&prs[i]);
   }

   printf("How many Frames : ");
   scanf("%d",&tf);

   while (currp<tp)
   {
      pf= chkpgfault();
      if (pf == -1)
      {
         totpf++;
         currf = nextFrame();
         frm[currf] = prs[currp];
      }

      displayFrame();
      currp++;
   }

   printf("\n  Frames \n");
   for(i=0;i<tf;i++)
   {
      for(j=0;j<tp;j++)
         {
            printf("%d ",m[j][i]);
         }

         printf("\n");
   }

   printf("\nTotal Page Fault : %d",totpf);
}
```

Output:-

```
How many Page References String : 16
Enter Page References String :
12 15 12 18 6 8 11 12 19 12 6 8 12 15 19 8
How many Frames : 3

  Frames
12 12 12 12 12 8 8 8 19 19 19 8 8 8 19 19
0 15 15 15 6 6 6 12 12 12 12 12 12 12 12 8
0 0 0 18 18 18 11 11 11 11 6 6 6 15 15 15

Total Page Fault : 13
```

Que.2). Write the simulation program to implement demand paging and show the page scheduling and total number of page faults for the following given page reference string. Give input n as the number of memory frames.

Reference String : 12,15,12,18,6,8,11,12,19,12,6,8,12,15,19,8

1) Implement OPT

Program:-

```
#include<stdio.h>
int prs[20],frm[10]={0};
int m[50][50];
int tp,tf,totpf=0,currp=0,currf=0;
int i,j,pf,max,frmno,cnt;

    int chkpgfault()
    {
        for(i=0;i<tf;i++)
        {
            if(frm[i] == prs[currp])
            {
                break;
            }
        }

        if(i==tf)
        {
            return -1;
        }
        else
        {
            return i;
        }
    }

    void displayFrame()
    {
        for(i=0;i<tf;i++)
        {
            m[currp][i] = frm[i];
        }
    }

    int nextFrame()
    {
        max = 0;
        frmno  = 0;
            for(i=0;i<tf;i++)
            {
                cnt = 0;
                for(j=currp+1;j<=tp;j++)
                {
                    if(frm[i] == prs[j])
                        break;
                    else
                        cnt++;
                }

                if(cnt>max)
                {
                    max = cnt;
                    frmno = i;
                }
            }
        return frmno;
    }

    void main()
    {
```

```
    printf("How many Page References String :");
    scanf("%d",&tp);

    printf("\nEnter Page References String :\n");
        for(i=0;i<tp;i++)
        {
            scanf("%d",&prs[i]);
        }
    printf("\nHow many Frames:\n");
    scanf("%d",&tf);

    while(currp<tp)
    {
        pf = chkpgfault();
        if(pf== -1)
        {
            totpf++;
            currf = nextFrame();
            frm[currf] = prs[currp];
        }
        displayFrame();
        currp++;
    }


    printf("\n\tFrames\t\n");

    for(i=0;i<tf;i++)
        {
            for(j=0;j<tp;j++)
                {
                    printf("%d ",m[j][i]);
                }
        printf("\n");
        }

    printf("\nTotal Page Fault:%d\n",totpf);

    }
```

Output:-

```
How many Page References String :16

Enter Page References String :
12 15 12 18 6 8 11 12 19 12 6 8 12 15 19 8

How many Frames:
3

        Frames
12 12 12 12 12 12 12 12 12 12 12 12 12 15 15 15
0 15 15 15 15 8 11 11 19 19 19 19 19 19 19 19
0 0 0 18 6 6 6 6 6 6 6 8 8 8 8 8

Total Page Fault:9
```

Que.3)Write the simulation program to implement demand paging and show the page scheduling and total number of page faults for the following given page reference string. Give input n as the number of memory frames.

Reference String: 2,5,2,8,5,4,1,2,3,2,6,1,2,5,9,8

1) Implement MRU

Program:-

```
#include<stdio.h>
int prs[20],frm[10]={0};
int m[50][50];
int tp,tf,totpf=0,currp=0,currf=0;
int i,j,pf,max,frmno,cnt;

    int chkpgfault()
    {
        for(i=0;i<tf;i++)
        {
            if(frm[i] == prs[currp])
            {
                break;
            }
        }

        if(i==tf)
        {
            return -1;
        }
        else
        {
            return i;
        }
    }

    void displayFrame()
    {
        for(i=0;i<tf;i++)
        {
            m[currp][i] = frm[i];
        }
    }

    int nextFrame()
    {
        max = 0;
        frmno  = 0;
            for(i=0;i<tf;i++)
            {
                cnt = 0;
                for(j=currp-1;j>=0;j--)
                {
                    if(frm[i] == prs[j])
                        break;
                    else
                        cnt++;
                }

                if(max>cnt)
                {
                    max = cnt;
                    frmno = i;
                }
```

```
                        }
                return frmno;
        }

        void main()
        {
        printf("How many Page References String :");
        scanf("%d",&tp);

        printf("\nEnter Page References String :\n");
                for(i=0;i<tp;i++)
                {
                        scanf("%d",&prs[i]);
                }
        printf("\nHow many Frames:\n");
        scanf("%d",&tf);

        while(currp<tp)
        {
                pf = chkpgfault();
                if(pf== -1)
                {
                        totpf++;
                        currf = nextFrame();
                        frm[currf] = prs[currp];
                }
                displayFrame();
                currp++;
        }

        printf("\n\tFrames\t\n");

        for(i=0;i<tf;i++)
                {
                        for(j=0;j<tp;j++)
                                {
                                        printf("%d ",m[j][i]);
                                }
                printf("\n");
                }

        printf("\nTotal Page Fault:%d\n",totpf);

        }
```

Output:-

```
How many Page References String :16
Enter Page References String :
2 5 2 8 5 4 1 2 3 2 6 1 2 5 9 8
How many Frames:
3

        Frames
2 5 2 8 5 4 1 2 3 2 6 1 2 5 9 8
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Total Page Fault:16
```