10. Write a C program to simulate page replacement algorithms
a) FIFO
b) LRU
c) Optimal

Code:

```
#include<stdio.h>

void main()
{
   int mem[20],process[20],n,m,i,j,k,c,z,a,distance=0,b;
   printf("Enter Size of memory:\n");
   scanf("%d",&n);

   for(i=0;i<n;i++)
      mem[i]=0;

   printf("Enter number of process in queue:\n");
   scanf("%d",&m);

   printf("Enter %d process \n",m);
   for(i=0;i<m;i++)
      scanf("%d",&process[i]);

   j=0;
   i=0;

   printf("\nFIFO:");
   while(j!=m)
   {
      k=0;
      c=0;
      while(k!=n)
      {
         c++;
         if(mem[k]==process[j])
         {
            j++;
            break;
         }
         k++;
      }
      if(c==n)
```

```
    {
        mem[i]=process[j];
        i=(i+1)%n;
    }
    printf("\nMemory: ");
    for(z=0;z<n;z++)
        printf("%d ",mem[z]);
    j++;
}

printf("\n\nLRU:");
for(i=0;i<n;i++)
    mem[i]=0;

i=0;
j=0;
while(j!=m)
{
    k=0;
    c=0;
    while(k!=n)
    {
        c++;
        if(mem[k]==process[j])
        {
            j++;
            break;
        }
        k++;
    }
    if(c==n)
    {
        distance=0;
        for(a=0;a<n;a++)
        {
            b=99;
            z=j;
            while(z>=0)
            {
                if((j-z)>distance)
                if(mem[a]==process[z])
                {
                    distance=(z-j);
                    b=z;
```

```
            }
            z--;
        }
    }
    if(b==99)
    b=i;
    mem[b]=process[j];
    i=(i+1)%n;
  }
  printf("\nMemory: ");
  for(z=0;z<n;z++)
    printf("%d ",mem[z]);
  j++;
}

printf("\n\nOptimal:");
for(i=0;i<n;i++)
  mem[i]=0;

i=0;
j=0;
while(j!=m)
{
  k=0;
  c=0;
  while(k!=n)
  {
    c++;
    if(mem[k]==process[j])
    {
      j++;
      break;
    }
    k++;
  }
  if(c==n)
  {
    distance=0;
    for(a=0;a<n;a++)
    {
      b=99;
      z=j;
      while(z!=m)
      {
```

```
                if((z-j)>distance)
                if(mem[a]==process[z])
                {
                    distance=(z-j);
                    b=z;
                }
                z++;
            }
        }
        if(b==99)
        b=i;
        mem[b]=process[j];
        i=(i+1)%n;
    }
    printf("\nMemory: ");
    for(z=0;z<n;z++)
        printf("%d ",mem[z]);
    j++;
  }
}
```

Output: