

Ex 10 (i)- Least recently used algorithm:

```
#include<bits/stdc++.h>
using namespace std;
using ll=long long;
void ynans(bool x){if(x) cout<<"YES";else cout<<"NO";}
#define vi vector<int>
#define rep(i,k,n) for(ll i=k;i<n;i++)
#define rof(i,k,n) for(ll i=k;i>n;i--)
#define pb(x) push_back(x)
#define sp(x,y) fixed<<setprecision(y)<<x
int sum() { return 0; }
template<typename T, typename... Args>
T sum(T a, Args... args) { return a + sum(args...); }
#define vi vector<int>
#define vc vector<char>
#define vs vector<string>
#define vll vector<ll>
#define vvi vector < vi >
#define pll pair<ll, ll>
#define ff first
#define ss second
#define casePrint(x,y) cout<<"Case #"<<x<<": "<<y;
#define all(c) c.begin(),c.end()
bool cmp(pair<char, int>& a,
        pair<char, int>& b)
{
    return a.second < b.second;
}
bool not_found(vector<pair<char, int> > &r,char c){
    bool flag=0;
    for(auto i:r){
        if(i.first==c){
            flag=1;
            break;
        }
    }
    return flag;
}
void replacement(vc &frame,string x,int p){
```

```

    ll ind=p;
    p--;
    ll done=0;
    while(p>=0){
        rep(j,0,frame.size()){
            if(frame[j]==x[p])
            {
                frame[j]=x[ind];
                done=1;
                break;
            }
        }
        if(done)
            break;
    }
}

int main(){
    string ref_string;
    cout<<"Enter the reference string(min length 20)\n";
    cin>>ref_string;
    ll n,pgfaults=0;
    cout<<"Enter frame size\n";
    cin>>n;
    vc frame(n,'-');
    ll p=0;
    rep(i,0,ref_string.length()){
        int flag=0;
        rep(j,0,n){
            if(ref_string[i]==frame[j])
                flag=1;
        }
        if(!flag){
            pgbfaults++;
            ll ok=0;
            rep(j,0,n){
                if(frame[j]=='-'){
                    frame[j]=ref_string[i];
                    ok=1;
                    break;
                }
            }
            if(!ok){

```

```

        replacement(frame,ref_string,i);
    }
}
rep(j,0,n){
    cout<<frame[j]<<" ";
}
cout<<"\n";

}

cout<<"No. of page fault: "<<pgfaults;

}

```

```

PS E:\VIT\4thsem\OS\lab\linuxpractice\20bce1161\lab10> cd
Enter the reference string(min length 20)
7012030423032120170
Enter frame size
3
7 - -
7 0 -
7 0 1
7 0 2
7 0 2
7 3 2
7 0 2
7 4 2
7 4 2
7 4 3
7 4 0
7 4 3
7 4 2
7 4 1
7 4 2
7 4 0
7 4 1
7 4 1
0 4 1
No. of page fault: 16

```

```
PS E:\VIT\4thsem\OS\lab\linuxpractice\20bce1161\lab10> cd '  
Enter the reference string(min length 20)  
7012030423032120170  
Enter frame size  
4  
7 - - -  
7 0 - -  
7 0 1 -  
7 0 1 2  
7 0 1 2  
7 3 1 2  
7 0 1 2  
7 4 1 2  
7 4 1 2  
7 4 1 3  
7 4 1 0  
7 4 1 3  
7 4 1 2  
7 4 1 2  
7 4 1 2  
7 4 1 0  
7 4 1 0  
7 4 1 0  
7 4 1 0  
No. of page fault: 12
```