Computer Networking Systems Department

DATA STRUCTURE

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Lecture 9

First course

Over view

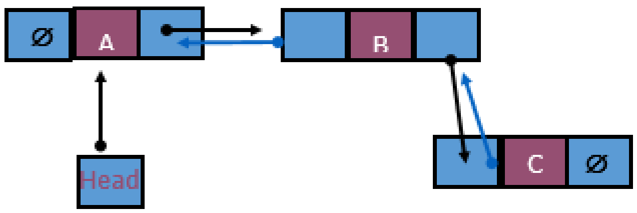
- Doubly linked lists
- Delete node form D.l.l. depending on value x.
- Insert node before specific information.
- Insert node after specific information

Doubly linked lists

Each node points to not only successor but the predecessor. There

are two NULL: at the first and last nodes in the list

Advantage: given a node, it is easy to visit its predecessor. Convenient to traverse lists backwards



Delete node f

```
p=l;
```

orm d.l.l. depending on value x

```
 while(p->info!=x)     p=p->rptr;
If(p->info==x){
if(p==l)  { l=l->rptr;
                l->lptr=0;
                 p->rptr=0;
                  delete p;  }
else  if(p==r) { r=r->lptr;
              r->rptr=0;
             p->lptr=0;
             delete p; }
 else      {      p->lptr->rptr=p-
          >rptr;               p->rptr-
          >lptr=p->lptr;    delete
          p; }}
else cout <<“not found”;
```

```
p=l;
```

Insert node before specific information

```
while(p->info!=x)    p=p->rptr;
 if(p->info==x)
          {t=new nod ;
          cin>>t->info;
           t->rptr=t->lptr=0;
           if (p==l)
                 {t->rptr=p;
                  P->lptr=t;
                  l=t;}
            else
                   {t->rptr=p;
                    t->lptr=p->lptr;
                    p->lptr=t;
          t->lptr->rptr=t; }
}
```

Insert node after specific information

```
p=l;
  while(p->info!=x)    p=p->rptr;
if(p->info==x)
{    t=new nod ;
      cin>>t->info;
      t->rptr=t->lptr=0;
      if(p==r)
          {t->lptr=r;
           r->rptr=t;
           r=t;}
     else
           {t->rptr=p->rptr;
            t->lptr=p;
             p->rptr=t;
             t->rptr->lptr=t;}
}
```

References

- Introduction to Algorithms, 3rd Edition by *Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein*
- Introduction to Algorithms, 3rd Edition by *Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein*
- Elements of Programming Interviews in Java: The Insiders' Guide, by *Adnan Aziz, Tsung-Hsien Lee, Amit Prakash*
- https://github.com/careermonk/DataStructuresAndAlgorithmsMadeEasy