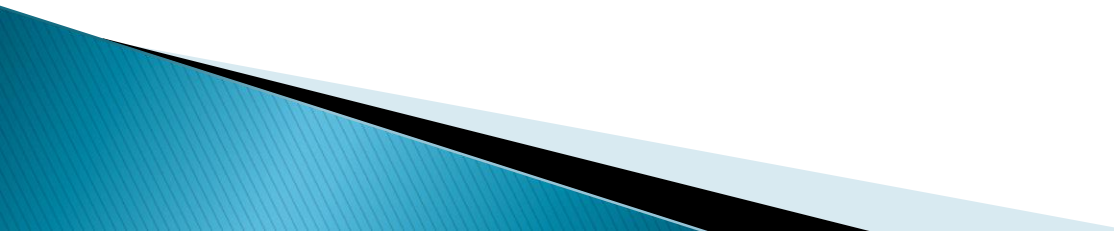


S04 – DS

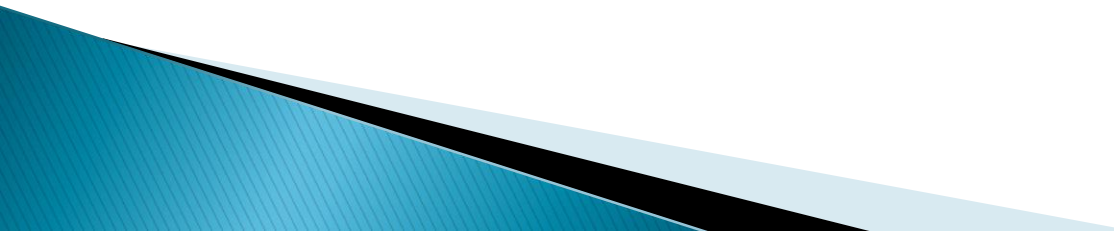
Alin Zamfiroiu

alin.zamfiroiu@csie.ase.ro

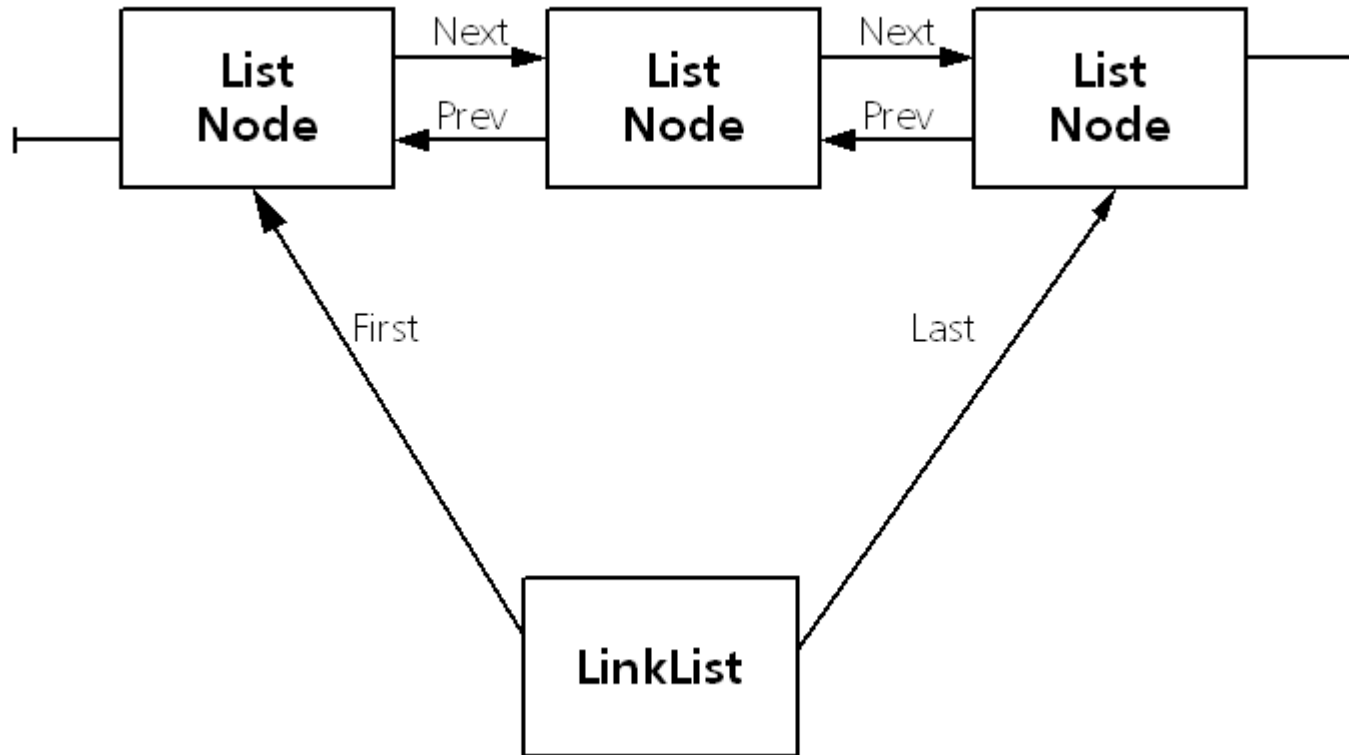
Student Scientific Session

- ▶ <http://csie.ase.ro/sesiune-stiintifica-studenteasca>
 - ▶ If do you want to start a new project, enroll on this session to present it.
 - ▶ If do you need help, I will help you.
- 

S04 – Content

- ▶ Building article
 - ▶ Doubly linked list
 - ▶ Insert beginning
 - ▶ Traversing the list
 - ▶ Insert at the end
 - ▶ Insert inside of the list
 - ▶ Extract element
- 

S04 - Doubly linked list



<http://destructor.de/linklist/index.htm>

S04 – Doubly linked list



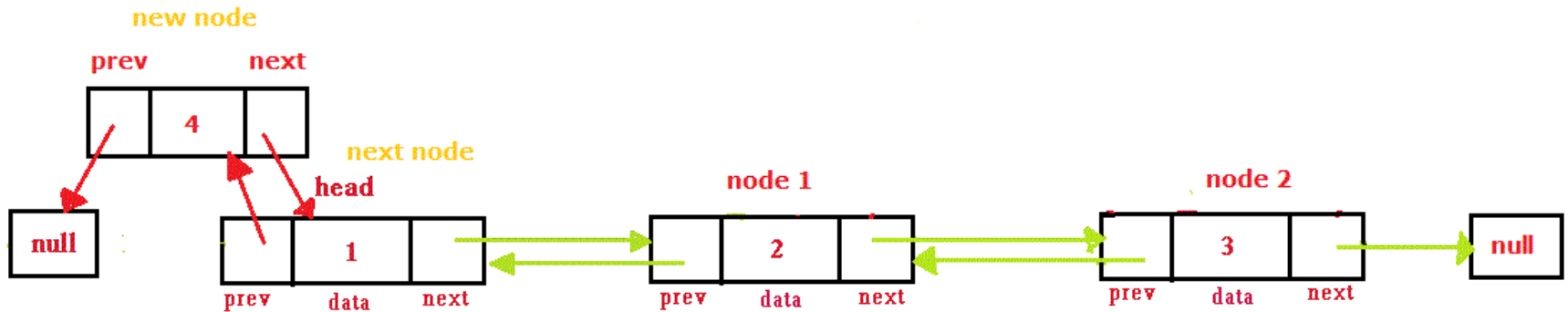
<http://proiectantidestructuri.ro/>

```
struct cladire
{
    int nr_etaje;
    int nr_camere;
};

struct nodLDI{
    cladire info;
    nodLDI *next;
    nodLDI *prev;
};

struct LDI
{
    nodLDI *prim;
    nodLDI *ult;
};
```

S04 - Insert beginning



<http://www.mybodhizone.com/>

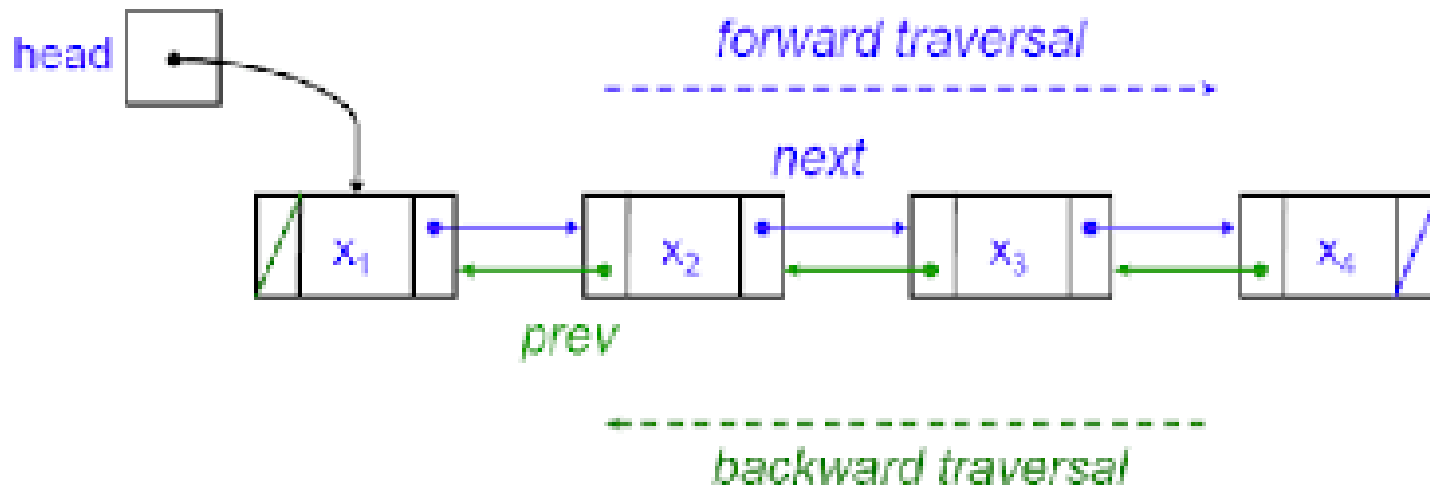
S04 – Insert beginning

```
void inserare_inceput(LDI*lista,cladire c){
    nodLDI* nou=(nodLDI*)malloc(sizeof(nodLDI));
    nou->info=c;
    nou->next=nou->prev=NULL;
    if(lista->prim==NULL){
        lista->prim=lista->ult=nou;
    }
    else
    {
        nou->next=lista->prim;
        lista->prim->prev=nou;
        lista->prim=nou;
    }
}
```

Here is a **shallow copy**, but the *Cladire* structure does not have dynamically attributes.

Call this function to insert at least 3 buildings in a doubly linked list.

S04 - Traversing the list



https://wiki.cs.auckland.ac.nz/compsci105ss/index.php/Linked_Lists

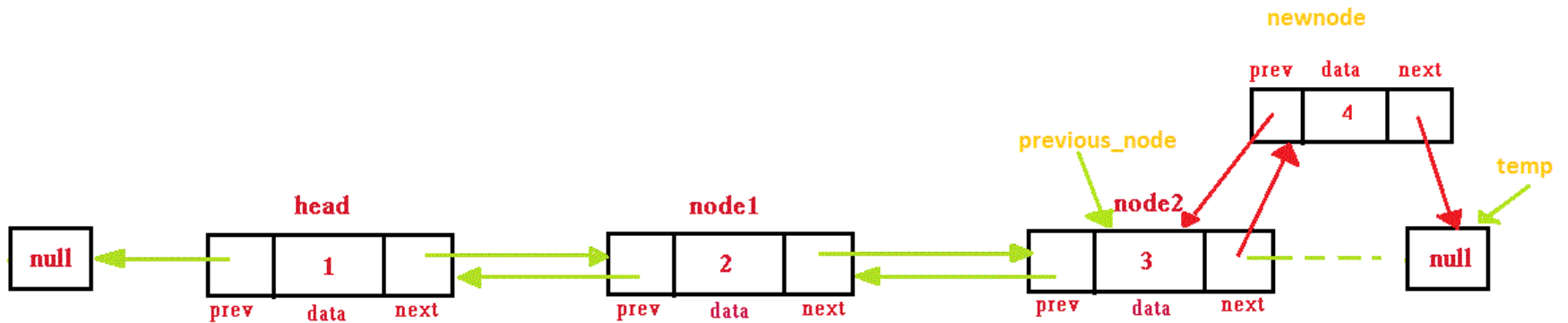
S04 – Traversing the list

```
void parcurgereLista(LDI*lista)
{
    nodLDI* p=lista->prim;
    while(p){
        printf("Cladirea are %d etaje si %d camere",p->info.nr_etaje,p->info.nr_camere);
        p=p->next;
    }
}
```

S04 – Invers traversing the list

```
void parcurgereInversa(LDI*lista)
{
    nodLDI* p=lista->ult;
    while(p){
        printf("Cladirea are %d etaje si %d camere",p->info.nr_etaje,p->info.nr_camere);
        p=p->prev;
    }
}
```

S04 - Insert at the end



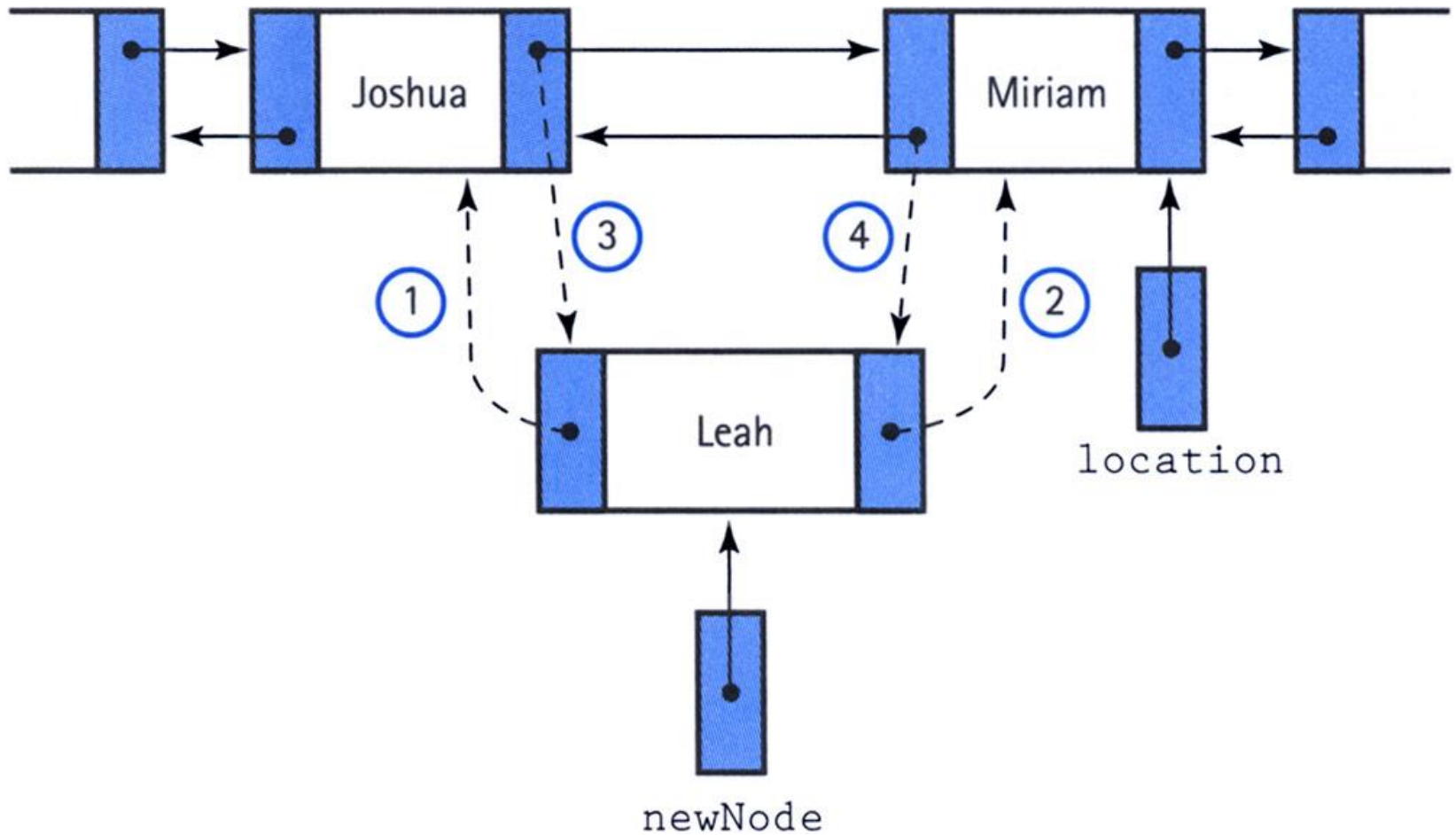
<http://www.mybodhizone.com/>

S04 – Insert at the end

Call this function to insert at least 3 buildings in a doubly linked list.

```
void inserire_sfarsit(LDI*lista,cladire c){
    nodLDI* nou=(nodLDI*)malloc(sizeof(nodLDI));
    nou->info=c;
    nou->next=nou->prev=NULL;
    if(lista->prim==NULL){
        lista->prim=lista->ult=nou;
    }
    else
    {
        nou->prev=lista->ult;
        lista->ult->next=nou;
        lista->ult=nou;
    }
}
```

S04 - Insert inside of the list



S04 – Extract element

```
cladire extrageDeLaInceput(LDI* lista)
{
    if(lista->prim)
    {
        cladire c=lista->prim->info;
        nodLDI*p=lista->prim;
        lista->prim=lista->prim->next;
        if(lista->prim==NULL)
            lista->ult=NULL;
        free(p);
        return c;
    }
}
```

S04 - Extract element

