Institut Teknologi Telkom Purwokerto

Teknik Informatika - Fakultas Informatika

By: Wahyu Andi Saputra [WAA]

Pertemuan 6 – Double dan Circular LL

Author: **Wahyu Andi Saputra [WAA]**

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OUTLINE

- Double Linked List
- Circular Single Linked List
- Circular Double Linked List

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Double Linked List

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Double Linked List

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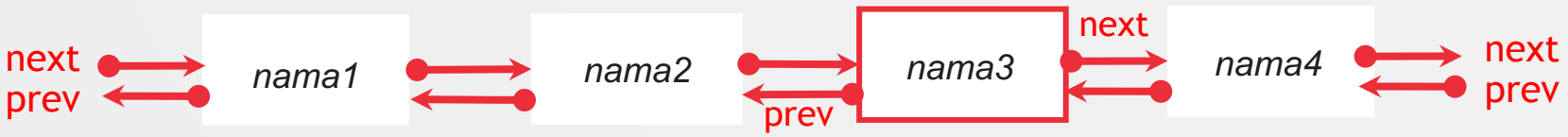
- Sama seperti single linked list, double linked list mempunyai struktur sequential.
- Double Linked List terdiri dari dua reference yang menunjuk ke node selanjutnya (**next** node) dan node sebelumnya (**previous** node)
- Untuk bergerak maju dan mundur pada double linked list menggunakan link **next** dan **prev** pada node.



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Double Linked List

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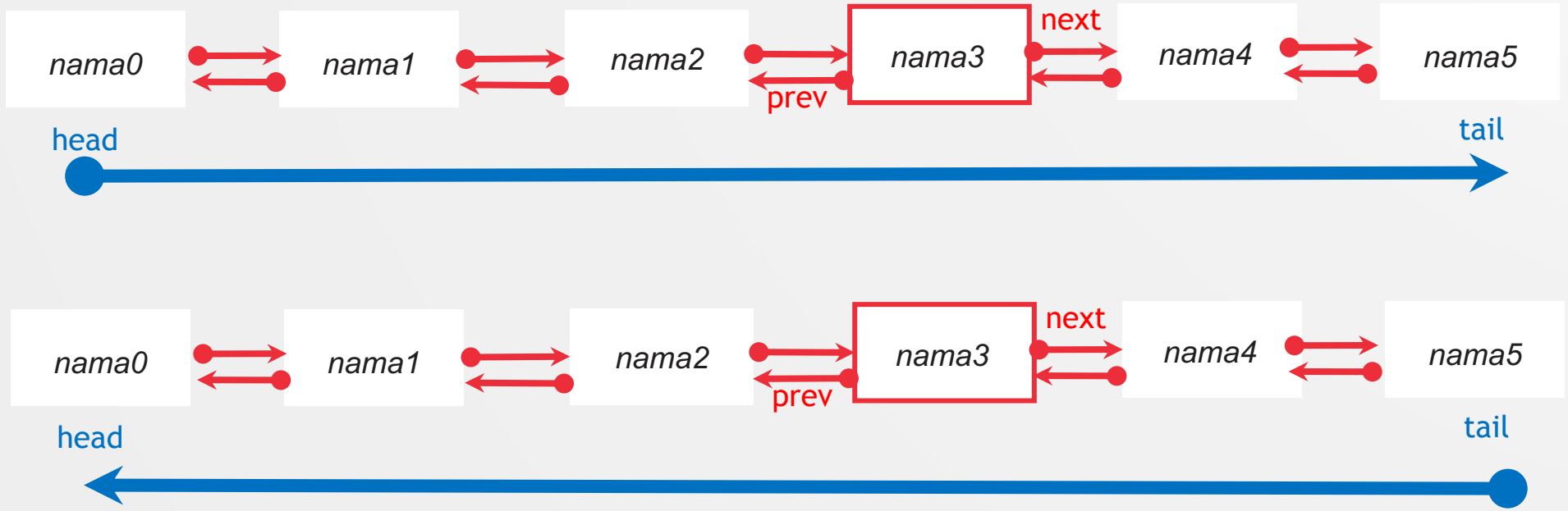
- Dapat melakukan pengaksesan dan pembacaan 2 arah, yaitu forward dan backward



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Double Linked List

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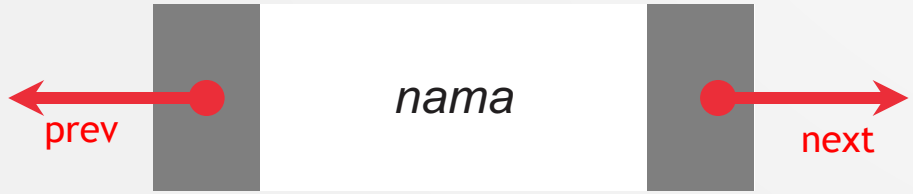
```
struct namaTeman
{
string nama;
namaTeman *next;
namaTeman *prev;
};
```



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Double Linked List

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```
void init()
{
    head = NULL;
}

int isEmpty()
{
    if (head == NULL)
        return 1;
    else
        return 0;
}
```

menginisiasi head di awal

Melakukan pengecekan apakah linked list masih kosong

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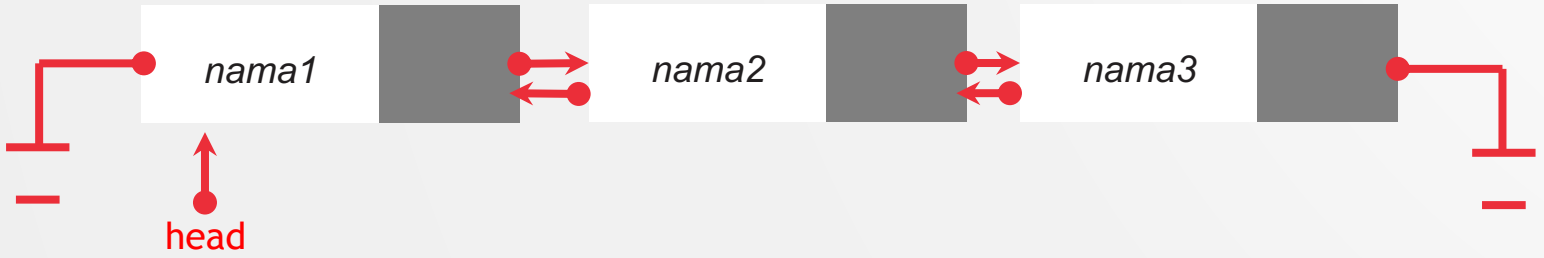
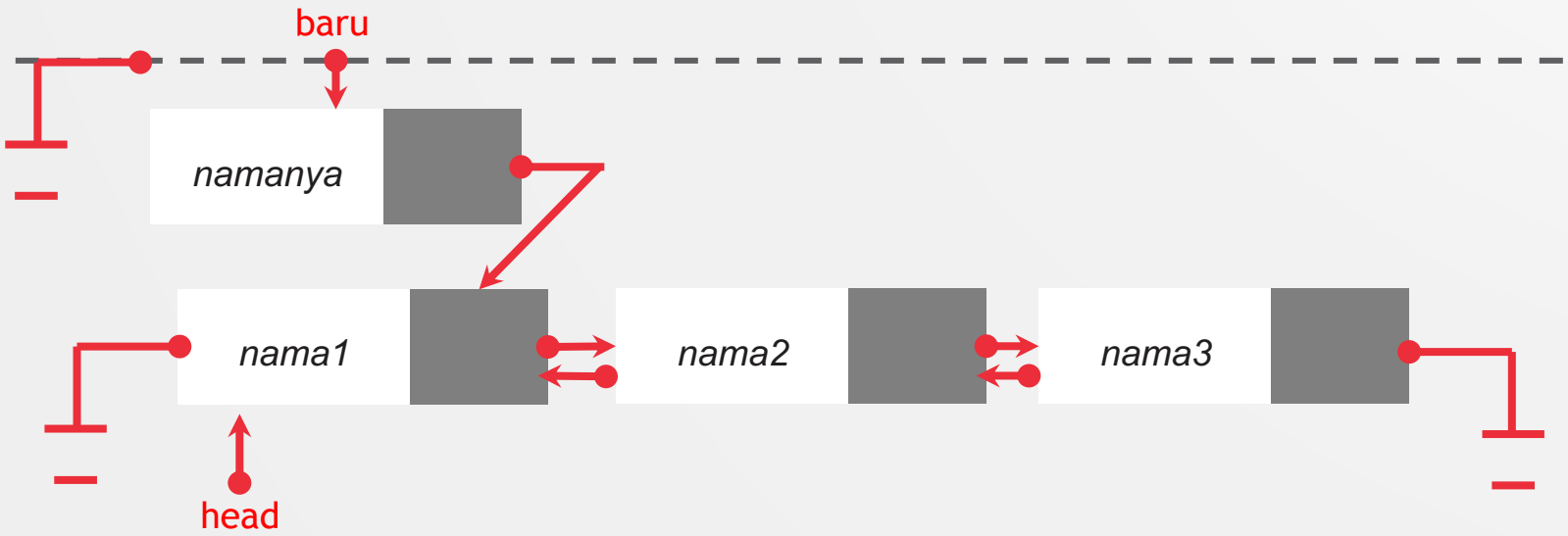
Double Linked List

Insert di awal

```
void tambahDiDepan(string namanya)
{
    namaTeman *baru;
    baru = new namaTeman;
    baru->nama = namanya;
    baru->next = NULL;
    baru->prev = NULL;
    if (isEmpty() == 1)
    {
        head = baru;
        head->next = NULL;
        head->prev = NULL;
    }
    else
    {
        baru->next = head;
        head->prev = baru;
        head = baru;
    }
}
```





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Double Linked List

Insert di awal

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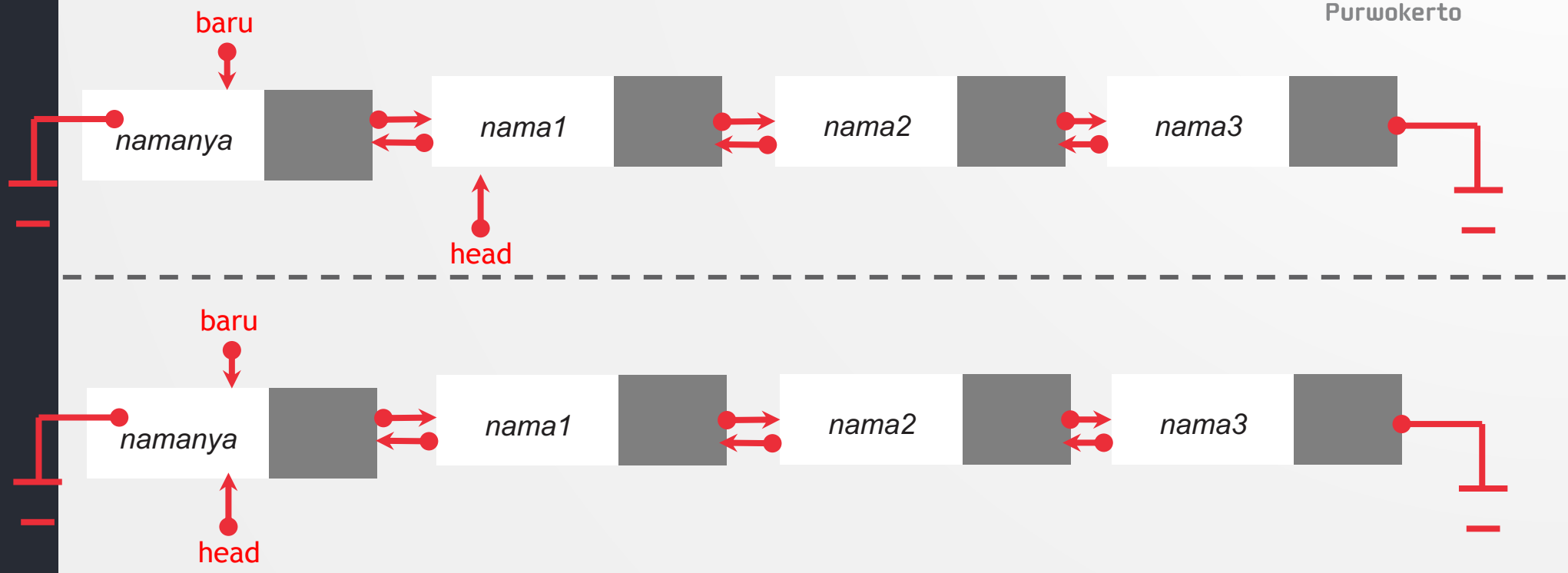
```
void tambahDiDepan(string namanya)
{
    namaTeman *baru;
    baru = new namaTeman;
    baru->nama = namanya;
    baru->next = NULL;
    baru->prev = NULL;
    if (isEmpty() == 1)
    {
        head = baru;
        head->next = NULL;
        head->prev = NULL;
    }
    else
    {
        baru->next = head;
        head->prev = baru;
        head = baru;
    }
}
```



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Double Linked List

Insert di akhir

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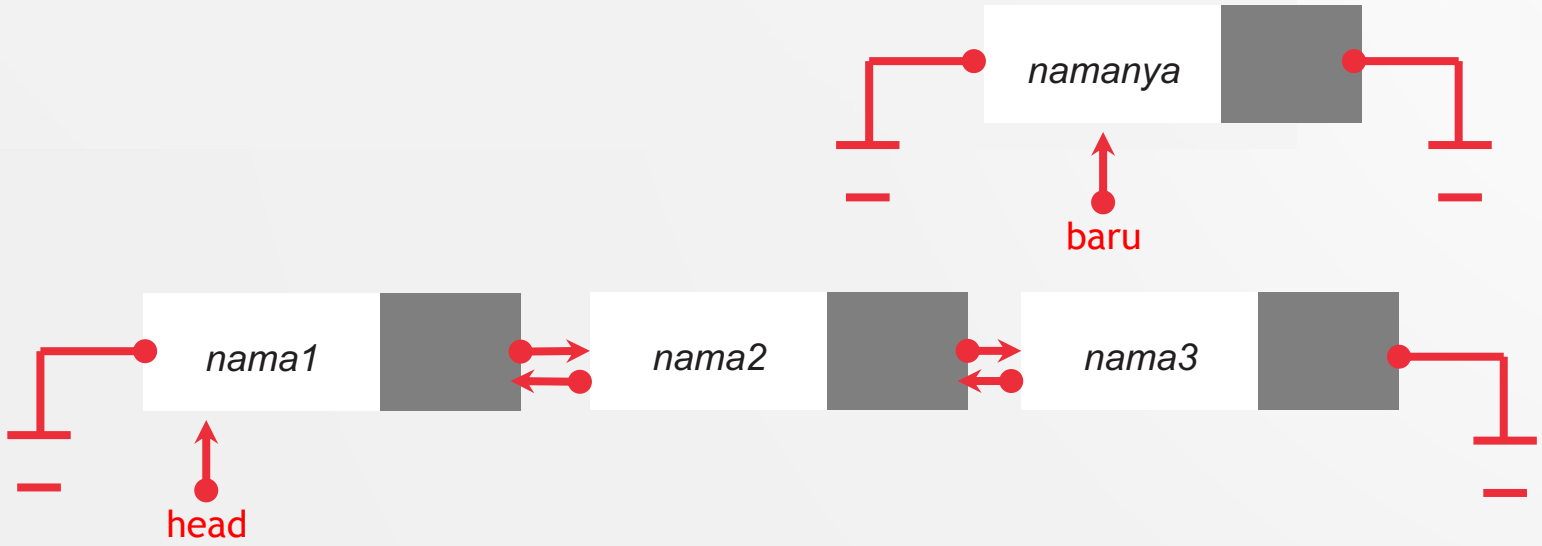
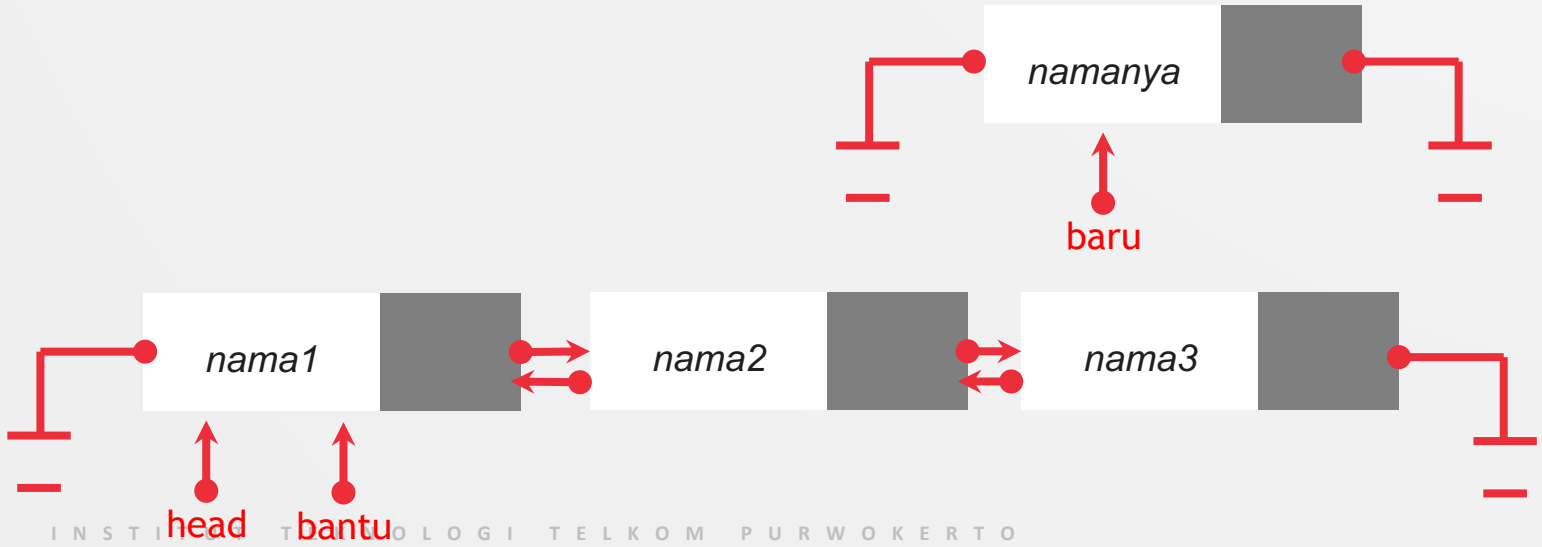
```
void tambahDiBelakang(string namanya)
{
    namaTeman *baru, *bantu;
    baru = new namaTeman;

    baru->nama = namanya;
    baru->next = NULL;
    baru->prev = NULL;

    if (isEmpty() == 1)
    {
        head = baru;
        head->next = NULL;
        head->prev = NULL;
    }
    else
    {
        bantu = head;
        while (bantu->next != NULL)
        {
            bantu = bantu->next;
        }
        bantu->next = baru;
        baru->prev = bantu;
    }
}
```





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Double Linked List

Insert di akhir

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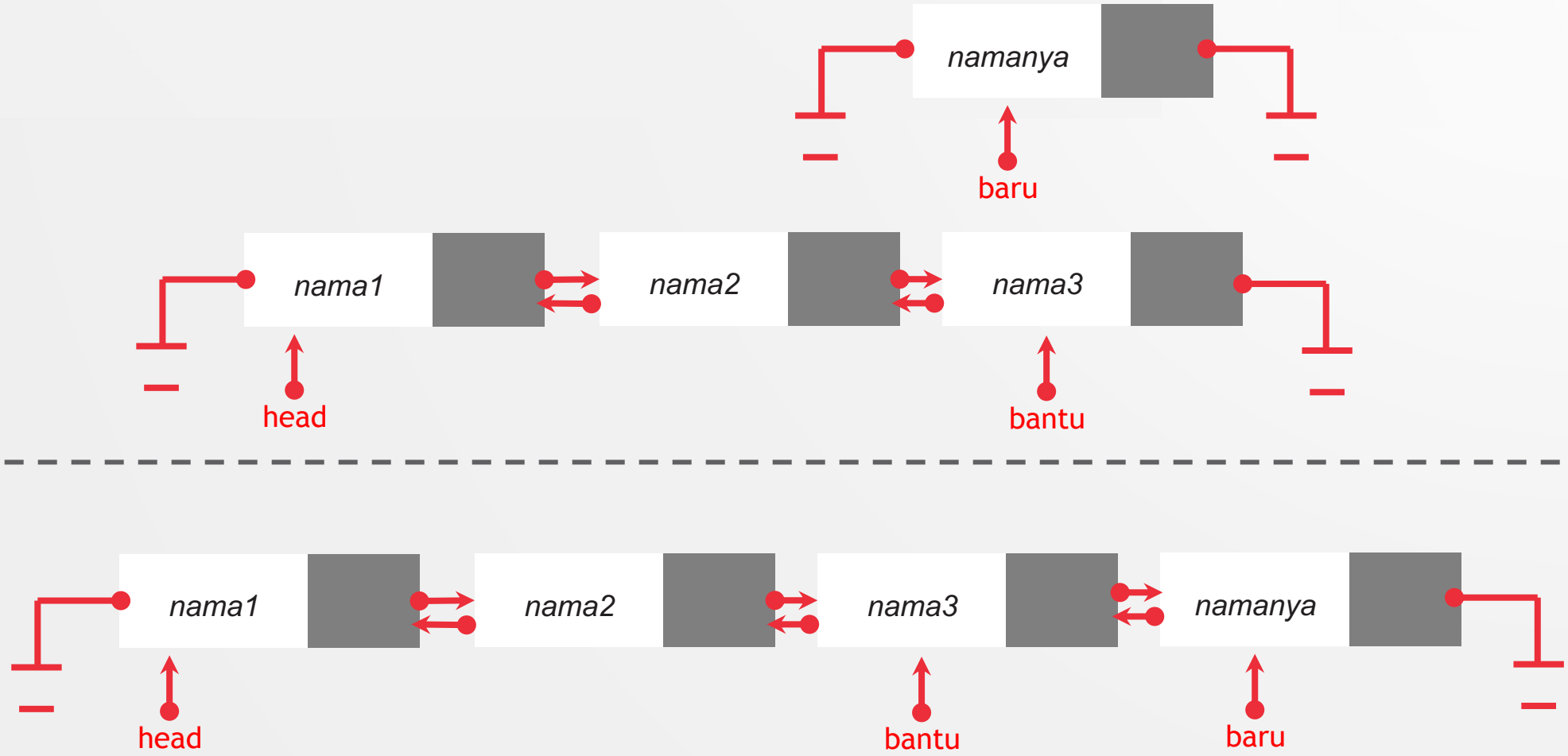
```
void tambahDiBelakang(string namanya)
{
    namaTeman *baru, *bantu;
    baru = new namaTeman;

    baru->nama = namanya;
    baru->next = NULL;
    baru->prev = NULL;

    if (isEmpty() == 1)
    {
        head = baru;
        head->next = NULL;
        head->prev = NULL;
    }
    else
    {
        bantu = head;
        while (bantu->next != NULL)
        {
            bantu = bantu->next;
        }
        bantu->next = baru;
        baru->prev = bantu;
    }
}
```



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Double Linked List

Insert setelah node tertentu

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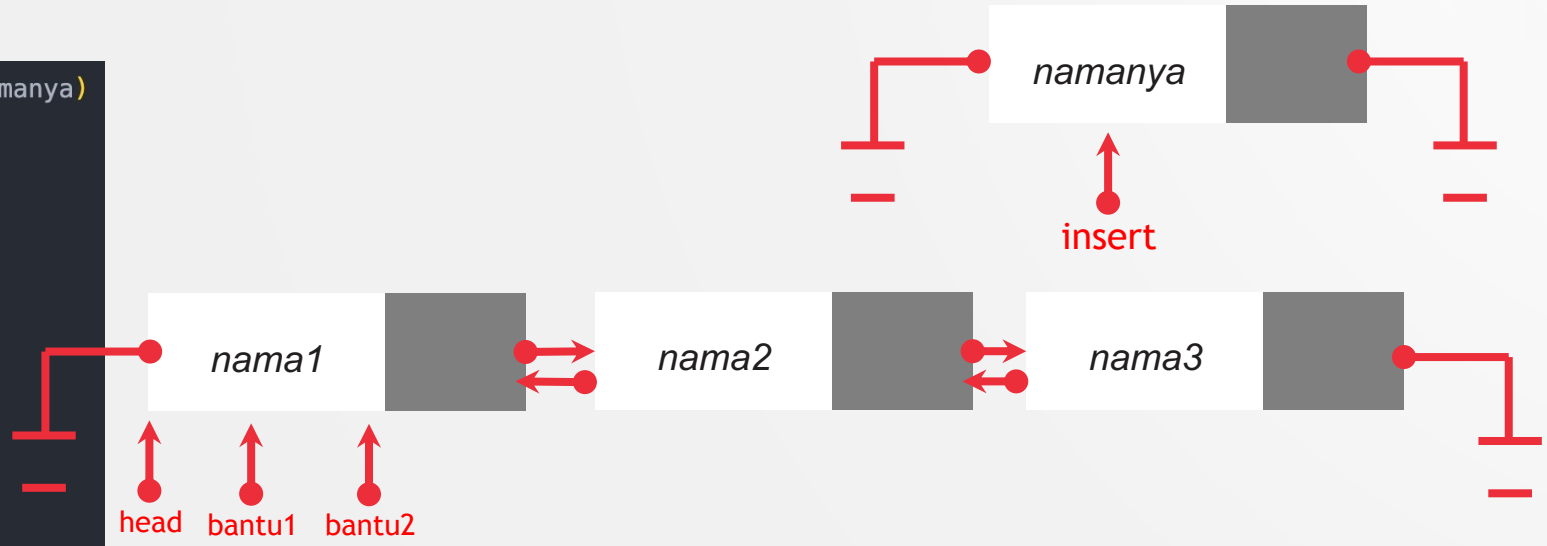
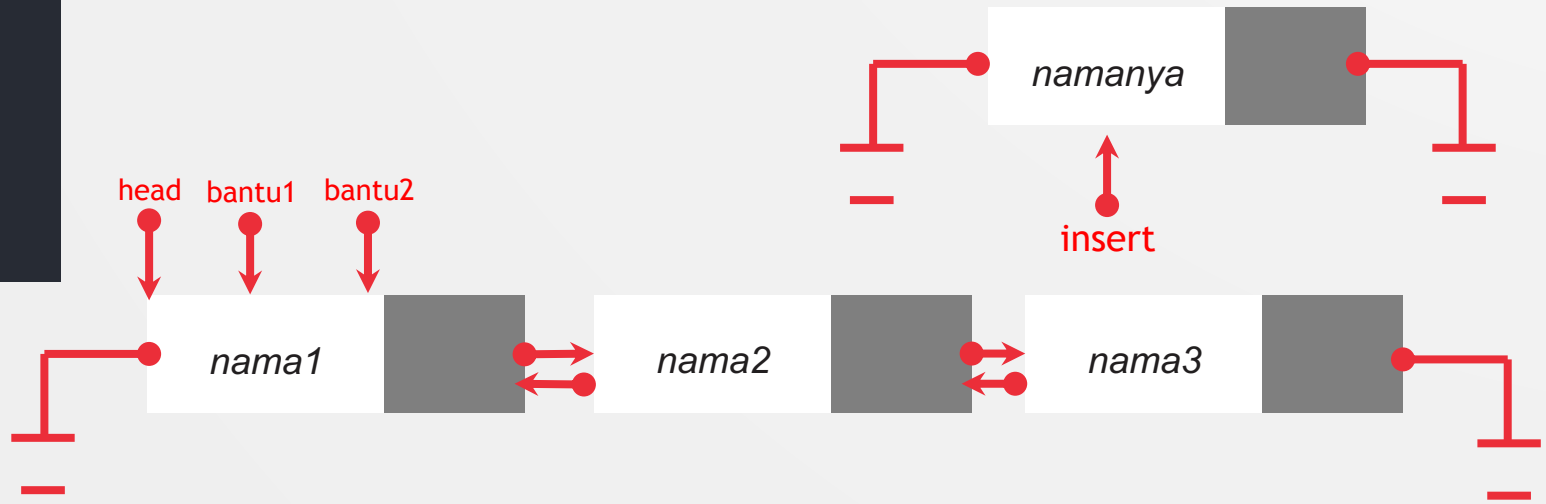
```
void tambahSetelah(string yangDicari, string namanya)
{
    namaTeman *insert, *bantu1, *bantu2;
    insert = new namaTeman();
    insert->nama = namanya;
    insert->next = NULL;
    insert->prev = NULL;

    bantu1 = head;
    bantu2 = head;

    do
    {
        bantu1 = bantu2;
        bantu2 = bantu2->next;
    } while (bantu1->nama != yangDicari);
    bantu1->next = insert;
    insert->next = bantu2;
    bantu2->prev = insert;
    insert->prev = bantu1;
}
```

Misal, setelah "nama2"





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Double Linked List

Insert setelah node tertentu

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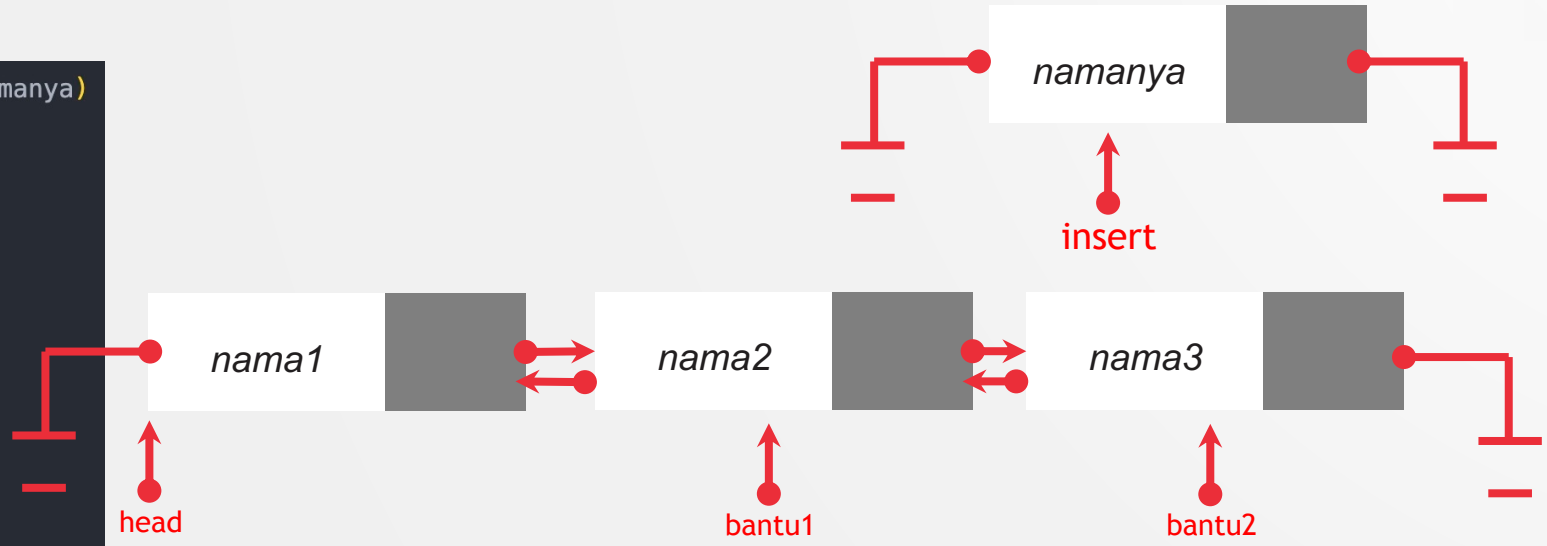
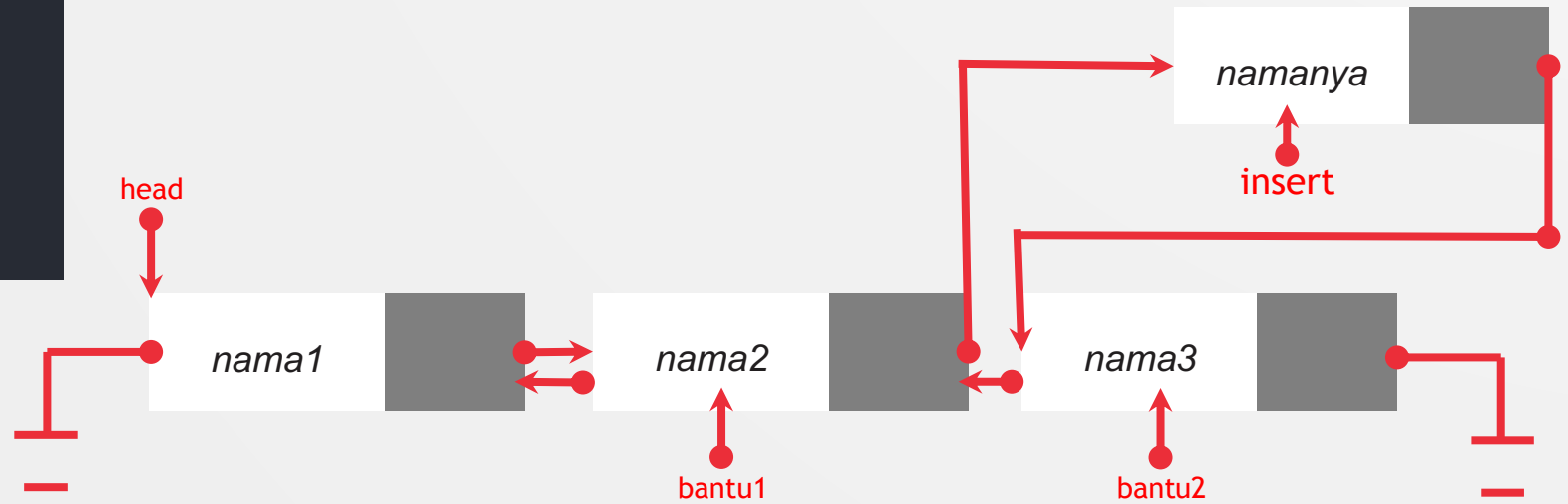
```
void tambahSetelah(string yangDicari, string namanya)
{
    namaTeman *insert, *bantu1, *bantu2;
    insert = new namaTeman();
    insert->nama = namanya;
    insert->next = NULL;
    insert->prev = NULL;

    bantu1 = head;
    bantu2 = head;

    do
    {
        bantu1 = bantu2;
        bantu2 = bantu2->next;
    } while (bantu1->nama != yangDicari);
    bantu1->next = insert;
    insert->next = bantu2;
    bantu2->prev = insert;
    insert->prev = bantu1;
}
```

Misal, setelah "nama2"





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Double Linked List

Insert setelah node tertentu

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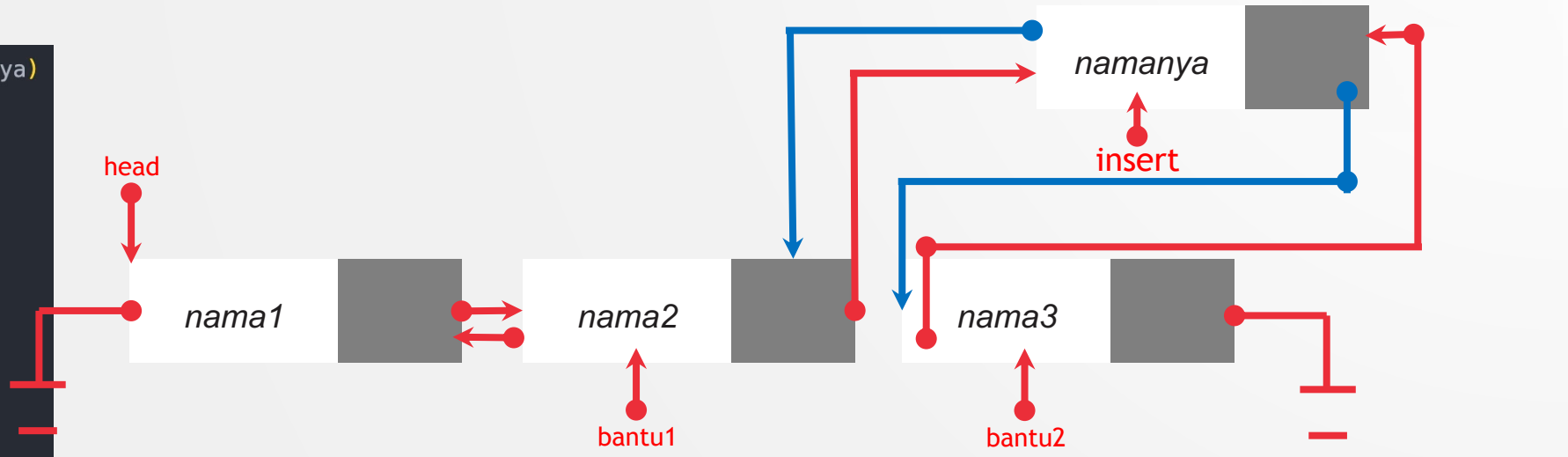
```
void tambahSetelah(string yangDicari, string namanya)
{
    namaTeman *insert, *bantu1, *bantu2;
    insert = new namaTeman();
    insert->nama = namanya;
    insert->next = NULL;
    insert->prev = NULL;

    bantu1 = head;
    bantu2 = head;

    do
    {
        bantu1 = bantu2;
        bantu2 = bantu2->next;
    } while (bantu1->nama != yangDicari);
    bantu1->next = insert;
    insert->next = bantu2;
    bantu2->prev = insert;
    insert->prev = bantu1;
}
```

Misal, setelah "nama2"



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Double Linked List

Insert sebelum node tertentu

CHALLENGE

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Bagaimana melakukan penambahan sebelum node tertentu?

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Double Linked List

hapus node awal

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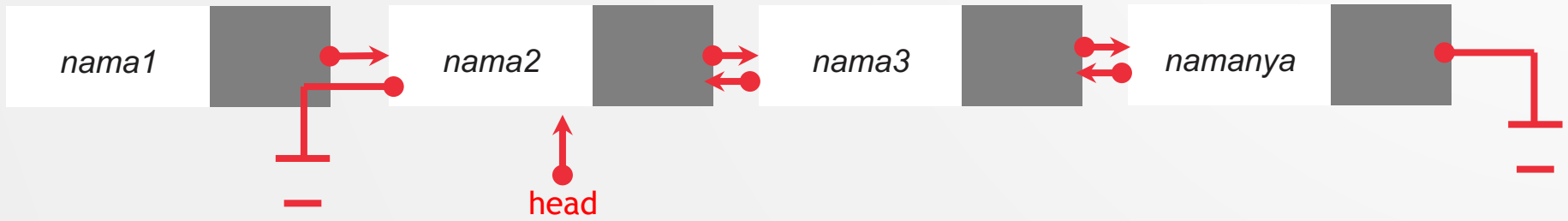
```
void hapusDiDepan()
{
    head = head->next;
    head->prev = NULL;
}
```



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Double Linked List

hapus node tertentu

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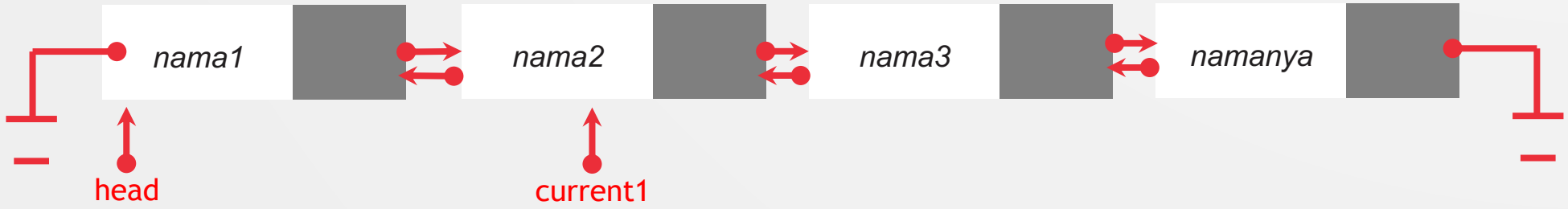
```
void hapusTertentu(string yangDicari)
{
    namaTeman *current1, *current2;
    current1 = head;
    while (current1->next->nama != yangDicari)
    {
        current1 = current1->next;
    }
    current1->next = current1->next->next;
    current2 = current1->next;
    current2->prev = current1;
}
```

Misal, hapus "nama3"



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Double Linked List

hapus node tertentu

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```
void hapusTertentu(string yangDicari)
{
    namaTeman *current1, *current2;
    current1 = head;
    while (current1->next->nama != yangDicari)
    {
        current1 = current1->next;
    }
    current1->next = current1->next->next;
    current2 = current1->next;
    current2->prev = current1;
}
```

Misal, hapus "nama3"

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Double Linked List

hapus node tertentu

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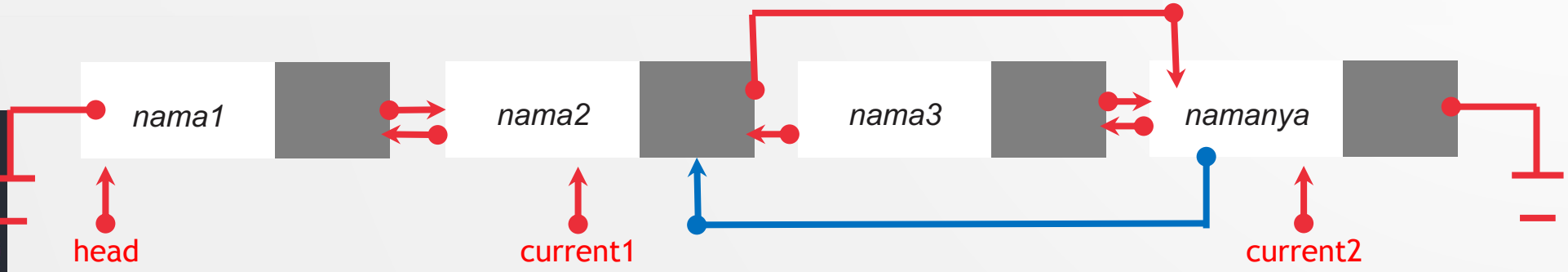
```
void hapusTertentu(string yangDicari)
{
    namaTeman *current1, *current2;
    current1 = head;
    while (current1->next->nama != yangDicari)
    {
        current1 = current1->next;
    }
    current1->next = current1->next->next;
    current2 = current1->next;
    current2->prev = current1;
}
```



Misal, hapus "nama3"

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Double Linked List

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CHALLENGE

Bagaimana melakukan penghapusan

Node paling akhir?

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Circular Linked List

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CIRCULAR LINKED LIST

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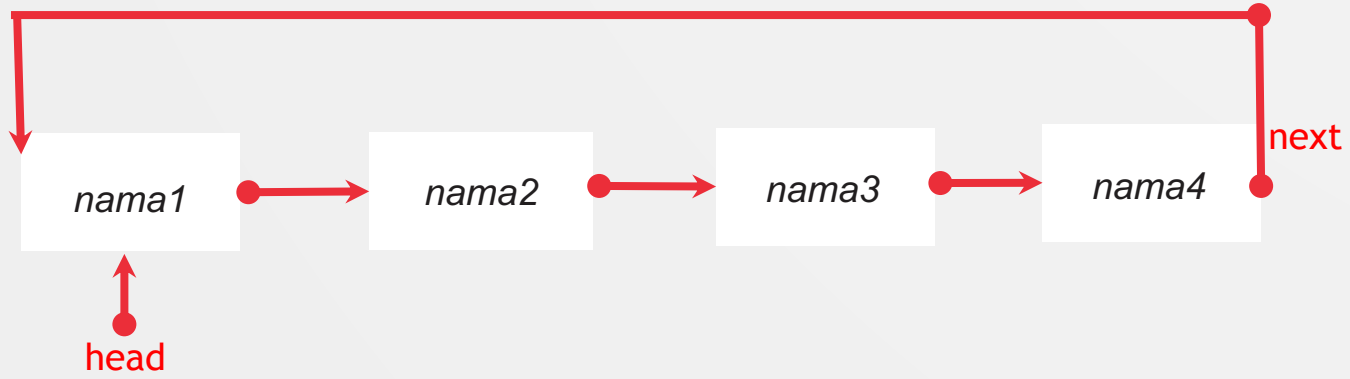
- Ciri khas dari suatu Circular Linked List adalah ia **tidak memiliki elemen NULL** pada seluruh node di dalamnya
- Jika pada Singular Linked List, node terakhir mengarah ke NULL. Maka, pada Circular Linked List, **node terakhir mengarah ke head** dari rangkaian Linked List
- Circular Linked List dapat digunakan untuk mengakses isi dari linked list berulangkali tanpa harus melakukan pengaksesan mundur terlebih dahulu



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Circular Single Linked List

Insert node di awal

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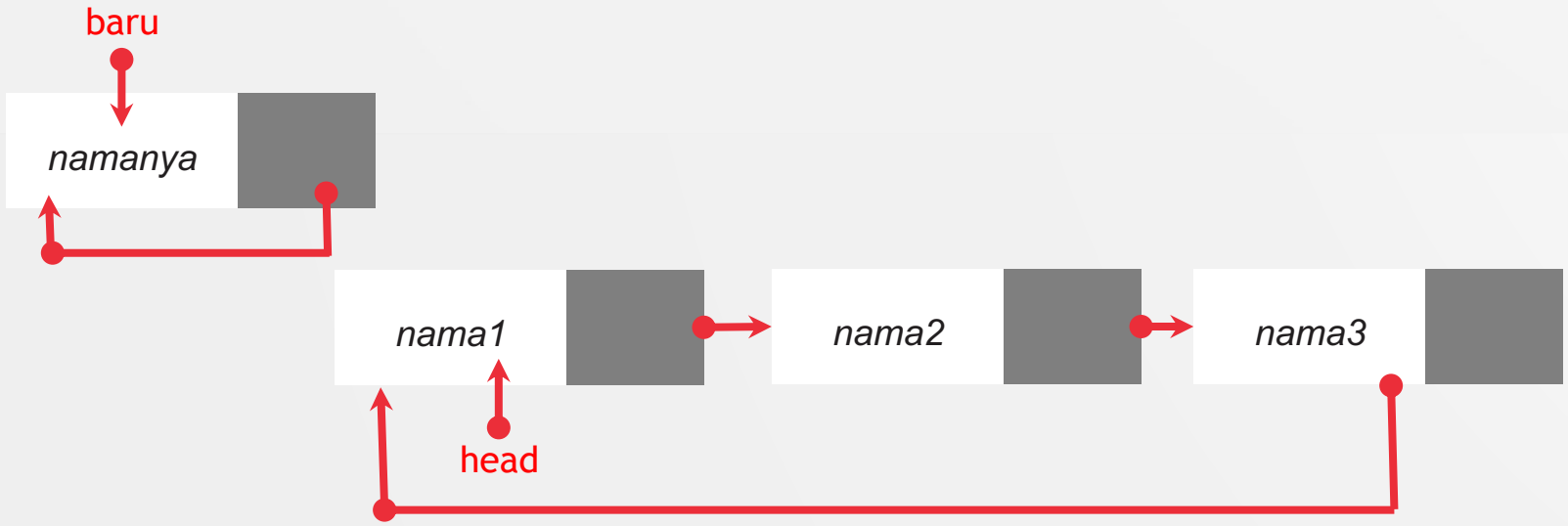

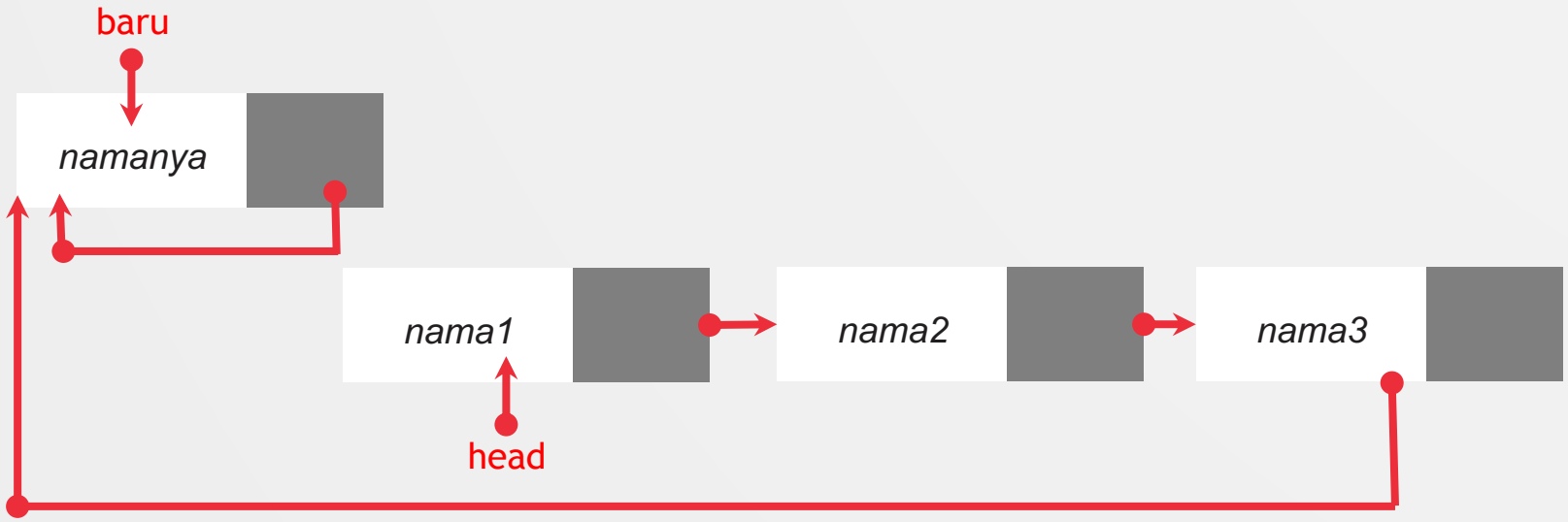

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Circular Single Linked List

Insert node di awal

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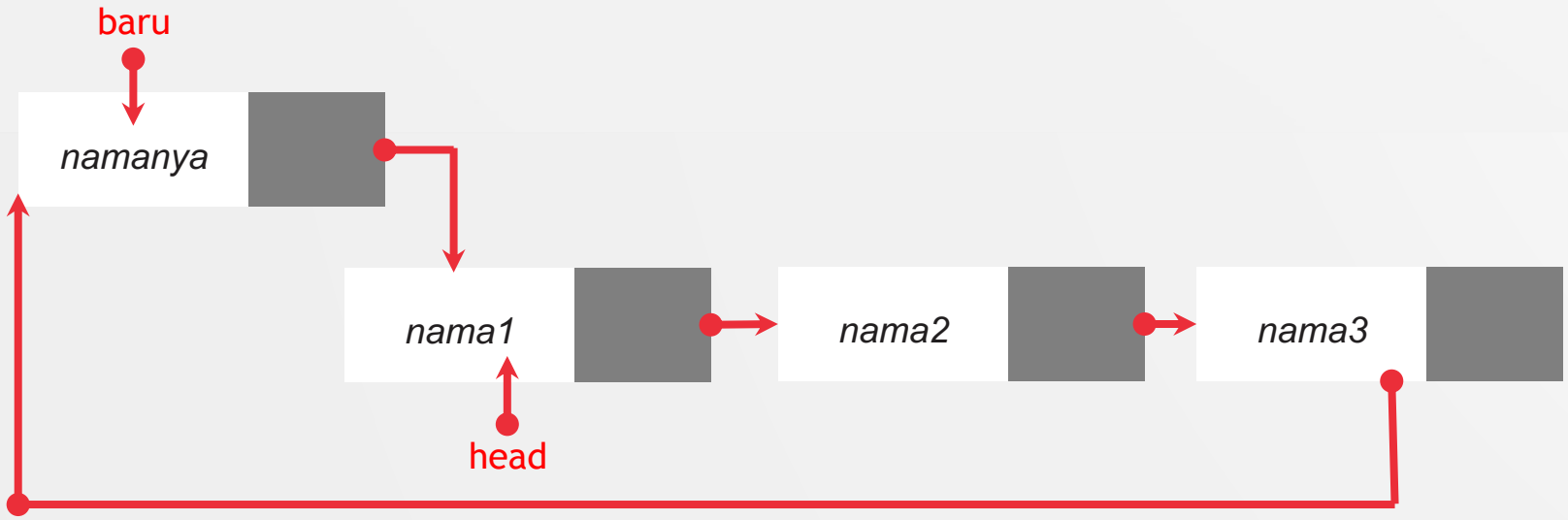

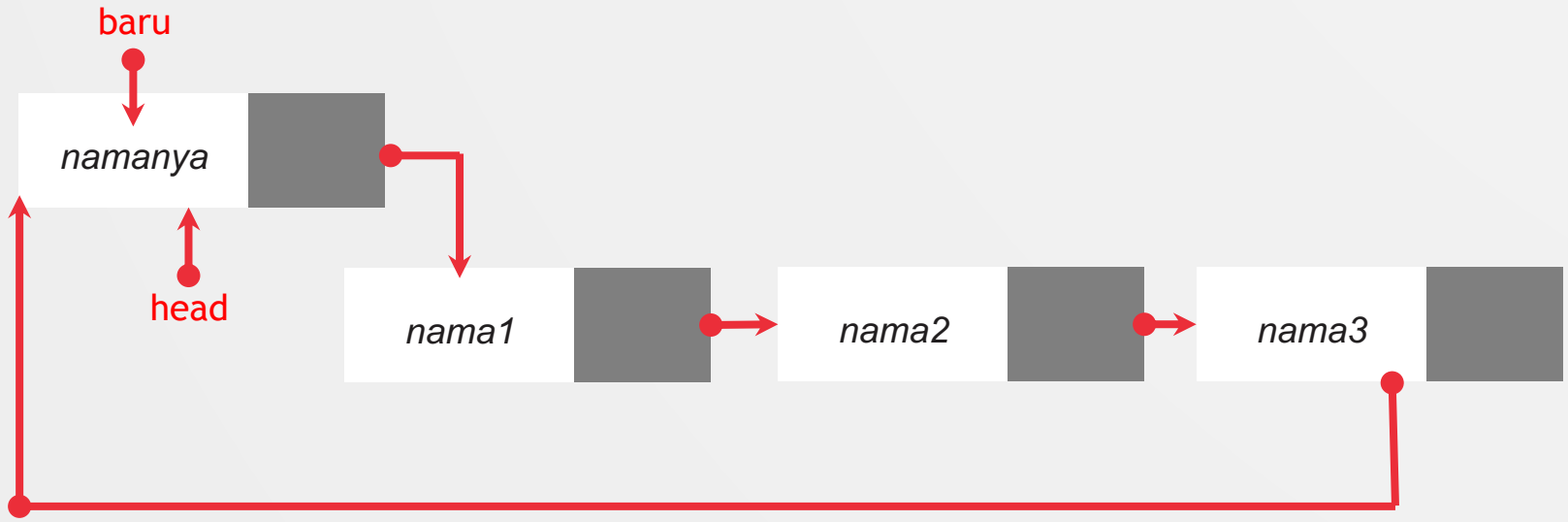

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Circular Single Linked List

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CHALLENGE

Bagaimana melakukan penambahan di node paling akhir pada Circular Single Linked List?

Bagaimana melakukan penghapusan suatu node pada Circular Single Linked List?

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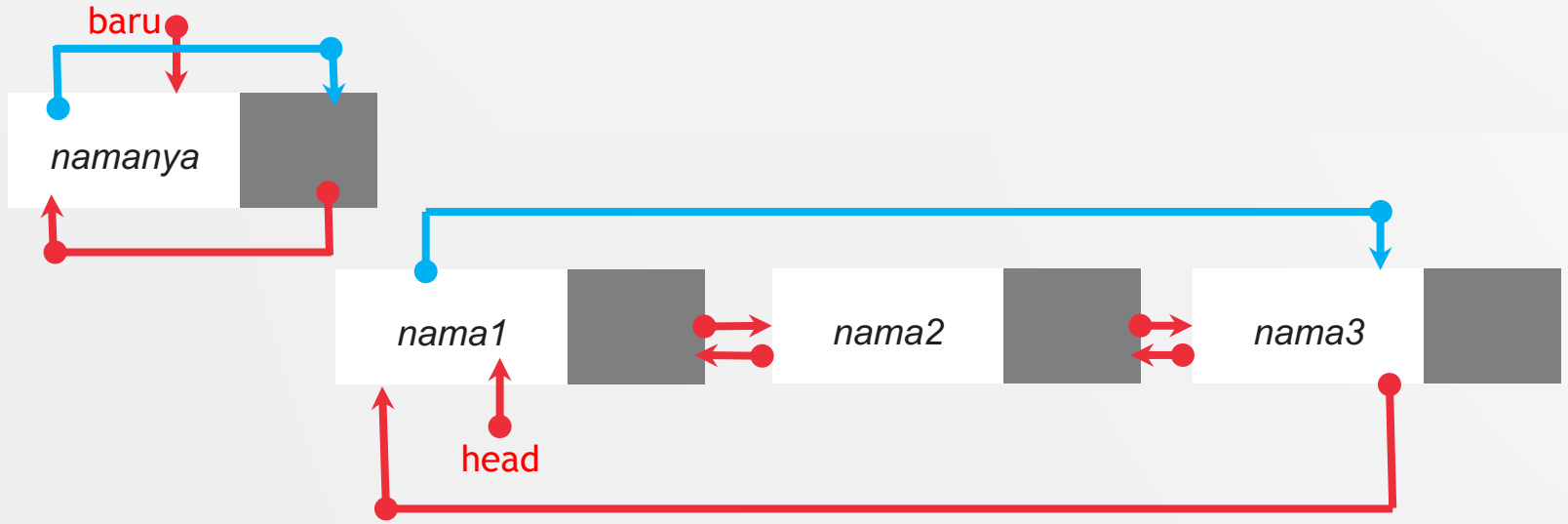
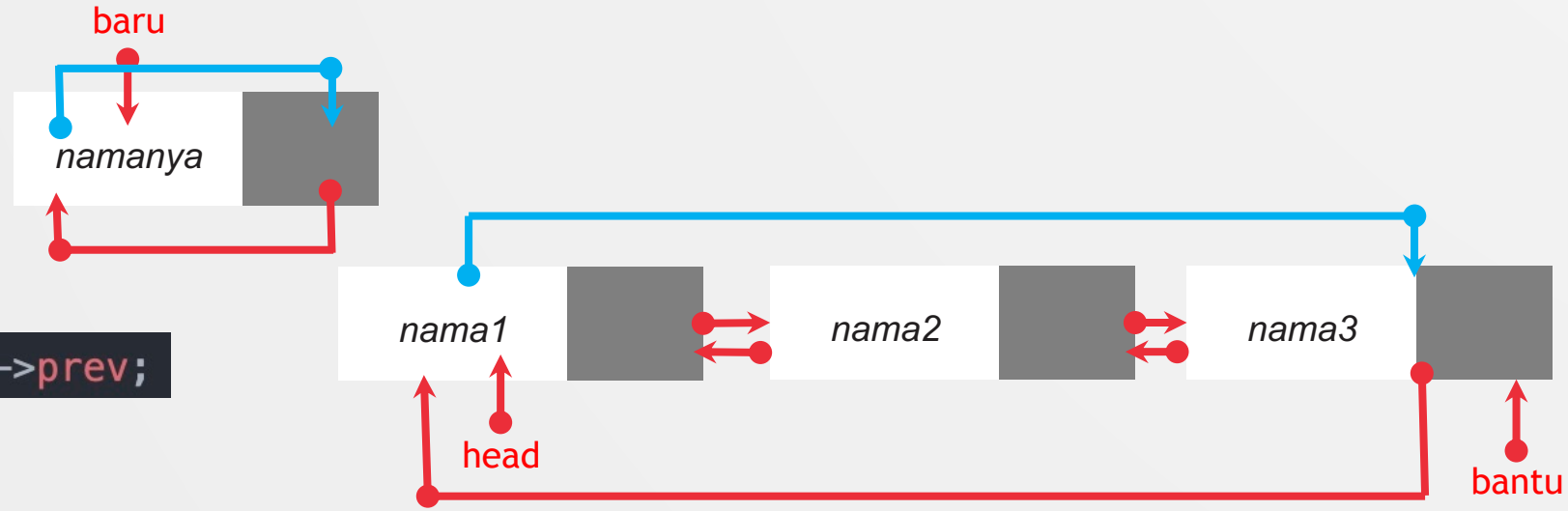
Circular Double Linked List

Insert node di awal






```
bantu = head->prev;
```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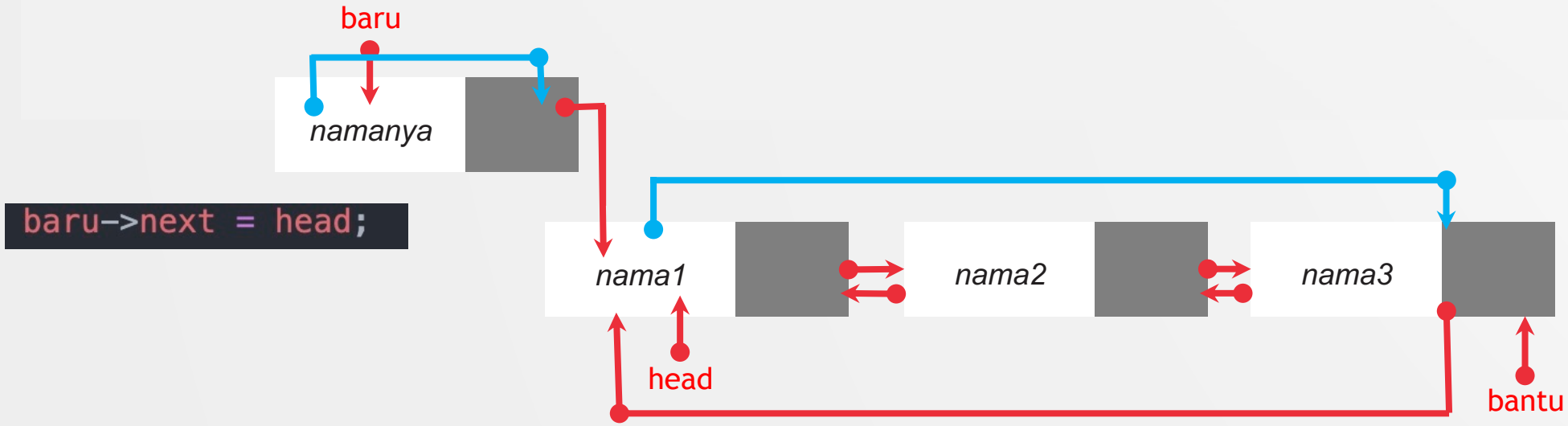
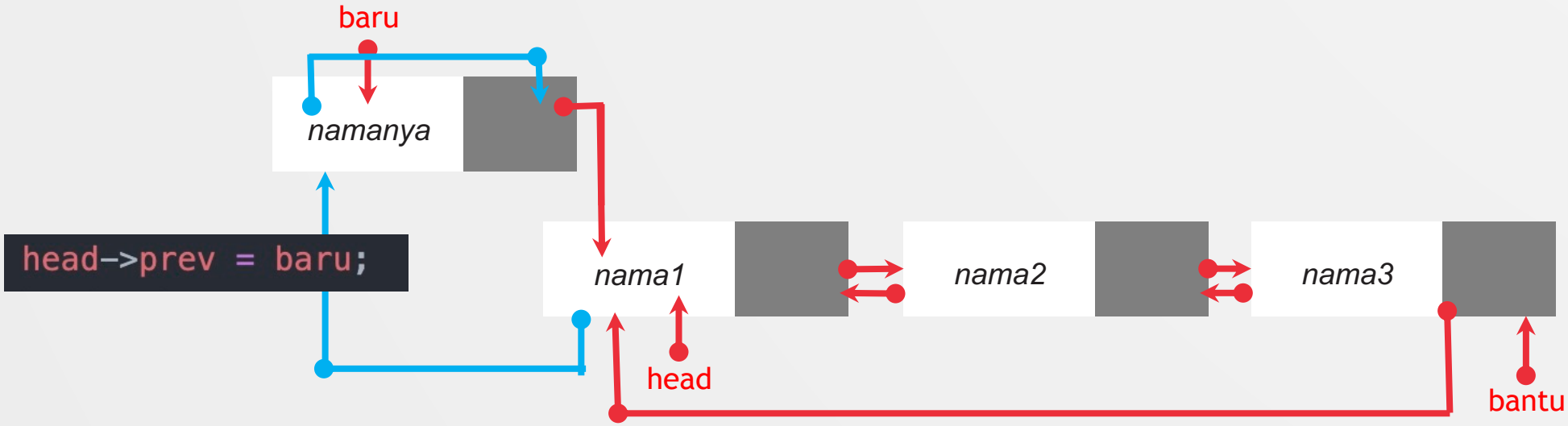
Circular Double Linked List

Insert node di awal





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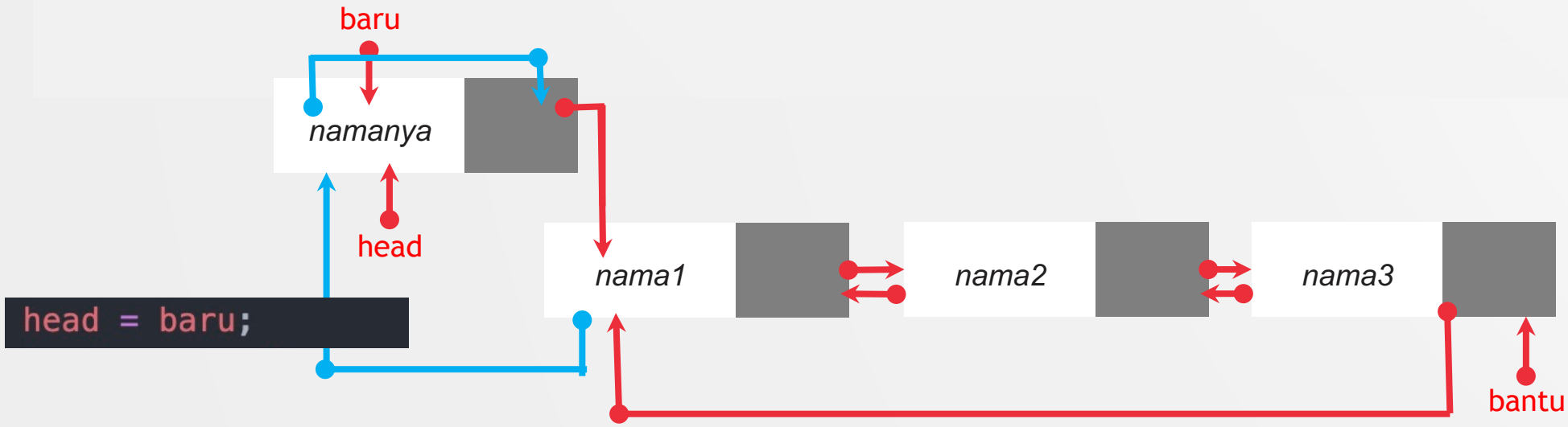
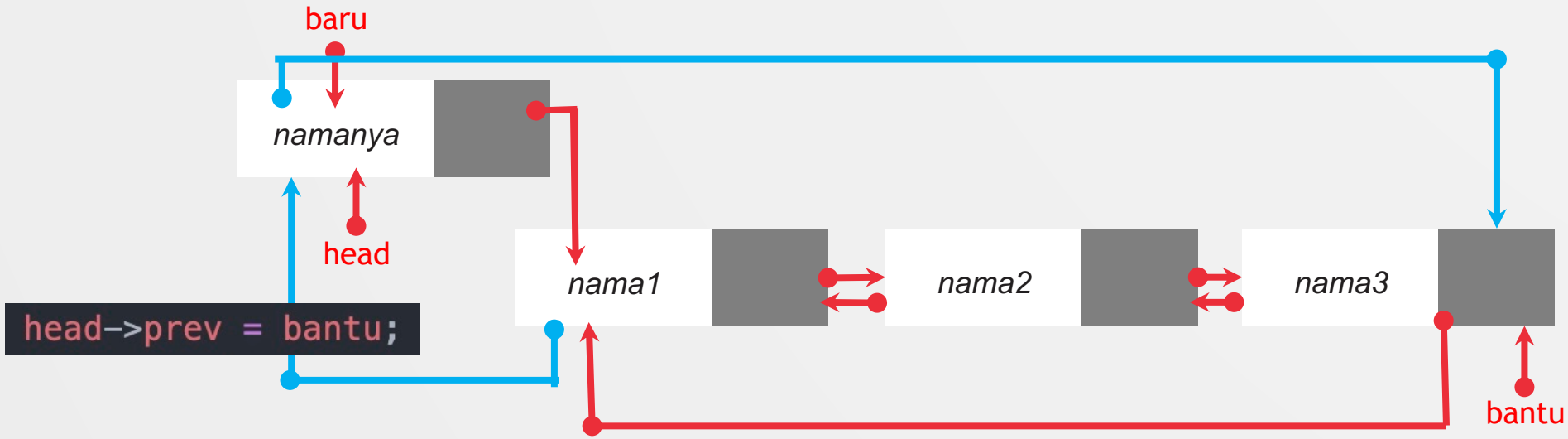
Circular Double Linked List

Insert node di awal





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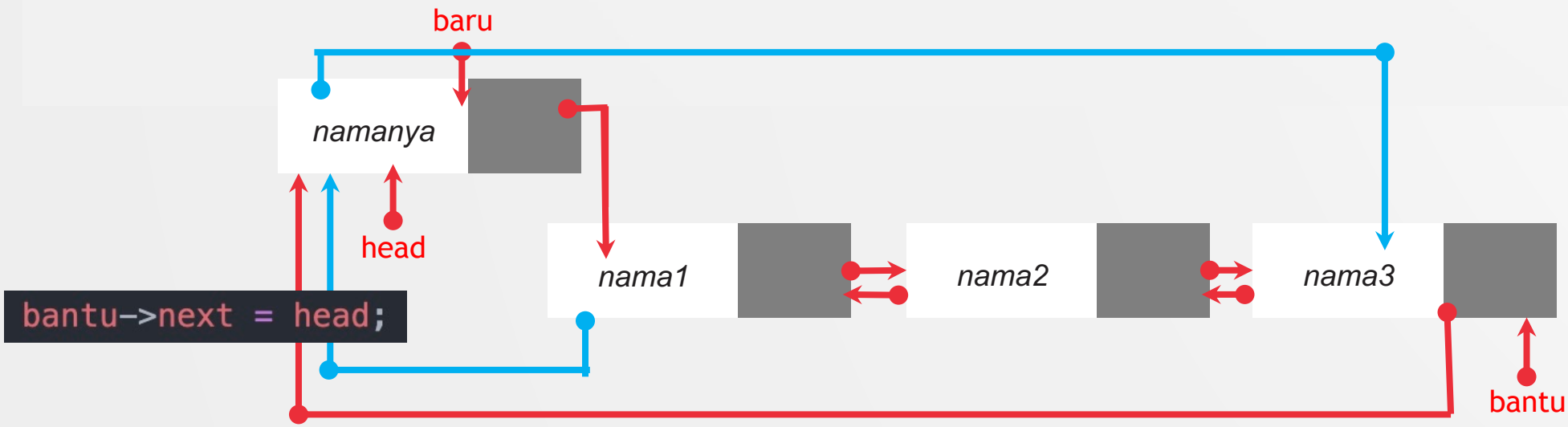
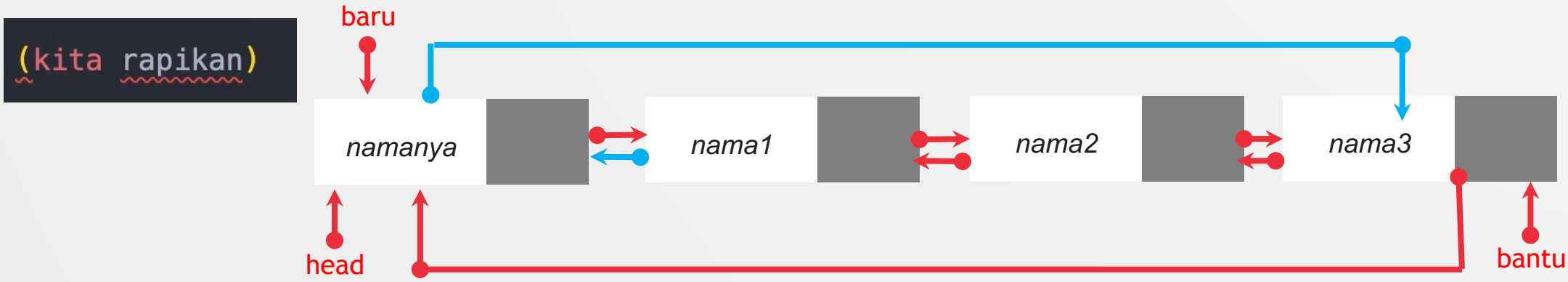
Circular Double Linked List

Insert node di awal





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Circular Double Linked List

Institut Teknologi Telkom Purwokerto

CHALLENGE

Bagaimana melakukan penambahan di node paling akhir pada Circular Double Linked List?

Bagaimana melakukan penghapusan suatu node pada Circular Double Linked List?

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TERIMA KASIH

Angkat tangan apabila ada pertanyaan