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Program : Efficient Doubly linked list

```
Node * insert_begin (Node * head, int data)
{
```

```
    Node * newn = new Node();
```

```
    newn->data = data;
```

```
    newn->ptrdiff = head;
```

```
    if (head != NULL)
```

```
    {
```

```
        head->ptrdiff = XOR(newn, head->ptrdiff);
```

```
    }
```

```
    head = newn;
```

```
    return head;
```

```
}
```

```
Node * insert_end (Node * head, int data)
{
```

```
    Node * newn = new Node();
```

```
    newn->data = data;
```

```
    Node * curr = head;
```

```
    Node * prev = NULL;
```

```
    while (curr curr != NULL)
```

```
    {
```

```
        next = XOR(prev, curr->ptrdiff)
```

```
        prev = curr;
```

```
        curr = next;
```

```
    }
```

```
    prev->ptrdiff = XOR(newn, prev->ptrdiff);
```

```
    newn->ptrdiff = XOR(newn, NULL);
```

```
    return head;
```

```
}
```

Anusree