Accessing Data in Linked List

- In this part of the course, I will only show you how to access the data stored in the elements of a linked list

  In a later part of the course (where we discuss **recursion**), I will show you how linked list are manipulated by the computer in more detail.

- **Example List Structure**

  I will use the following list structure in my examples:

```
 +-------------+
 |    value    |  <--- contains an integer value
 +-------------+
 |    next     |  <--- contains a reference to the next list element
 +-------------+
```

  I also assume that a linked list has **already** been set up

  I will discuss how to manipulate list later, here, all I want to achieve is to show you how the indirect addressing mode is used to **access** list elements

  The following is a list variable and it's definition in assembler:

```
High level language          Assembler language
===================          ==================

List head;                   head: ds.l 1
```

- **Example 1:**

```
High level language          Assembler language
===================          ==================

int ans;

answer = head.value;         movea.l  head, a0
                             move.l   (a0), ans
```

- **Example 2:**

```
High level language          Assembler language
===================          ==================

int ans;

answer = head.next.value;    movea.l  head, a0
                             movea.l  4(a0), a0
                             move.l   (a0), ans
```

- **Example 3:**

```
 High level language               Assembler language
 ===================               ==================

 int ans;

 answer = head.next.next.value;     movea.l  head, a0
                                    movea.l  4(a0), a0
                                    movea.l  4(a0), a0
                                    move.l   (a0), ans
```

- Here is an assembler program containing the examples:
    - Assembler DEMO program: click here
    - To see the linked list, you need the following EGTAPI debug information file: click here