Department of Computer Science and Engineering
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Data Structures Quiz, Chapter 4, Oct. 21, 2024

1. Write a C++ function to find the minimum of all elements in a linked list of integers. (50%)

```
class ChainNode {
   int data;
   ChainNode *link;
};
class Chain {
   ChainNode *first;    // first node of the list
   int min_value( )
// Return the minimum value.
// Return -999 if the chain is empty.
   {
```

Please write the body of min_value ( ).

```
   } // end of min_value ( )
};
```

2. Write a C++ function to reverse a singly linked list. For example, suppose that the given list $X=(x_1, x_2, \ldots, x_{n-1}, x_n)$. After the reversing process, the list will become $(x_n, x_{n-1}, \ldots, x_2, x_1)$. (50%)

```
class ChainNode {
 public:
   int data;
   ChainNode *link;
};
class Chain {
   ChainNode *first;      // first node of the list
   void reverse( )
        // Reverse the list.
   {
   ChainNode *p, *c;          //    p:previous, c:current
```

Please write the body of reverse ( ).

```
   } // end of reverse ( )
};   // end of class Chain
```

參考解答

1.

```
int min_value()
{
      if(first == NULL) return -999;    // empty linked list
      int ans = INT_MAX;          // infinite
      ChainNode *c = first;      // current
      while(c){
            if(c->data < ans){
                  ans = c->data;
            }
            c = c->link;
      }
      return ans;
}
```

2.

```
void reverse( )    // Reverse the list.
{
   ChainNode *p, *c;          //    p:previous, c:current
   c = first
   p = 0;      // before current
   while (c) {
      ChainNode *r = p;
      p = c;
      c = c ->link;      // moves to next node
      p->link = r; // reverse the link
   }
   first = p;
} // end of reverse ( )
```