



Linked Lists

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Operators on Linked List:

- Create(LL): create a linked list LL.
- Insert(M,X,LL): add a new node M after a node X in a linked list LL
- Delete(M,LL): move a node M off a linked list LL
- Combine(LL1,LL2): combine 2 linked lists together
- Find(M,LL): whether a node M is in a linked list LL
- Count(LL): count the number of nodes in a linked list LL

1. Store a polynomial by using linked lists. Write a program that performs 4 arithmetic operators (+, -, *, /) on two polynomials above.
2. Build a queue and its operators by using linked lists.
3. Write a program that sorts a linked list.
4. Solve the Josephus problem.

There are people standing in a circle waiting to be executed. After the first person is executed, a certain number of people are skipped and one person is executed. Then, again, people are skipped and a person is executed. The elimination proceeds around the circle (which is becoming smaller and smaller as the executed people are removed), until only the last person remains, who is given freedom.

5. Write a program that adds two big integers, each integer contains 300 number characters.
6. Write a program that multiplies two big integers, each integer contains 300 number characters.
7. *Analyze a natural number S into a total of prime numbers.

$S = F_{i1} + F_{i2} + \dots + F_{ik}$ where F_{ij} is a prime number and $(2 \leq i_1 \leq i_2 \leq \dots \leq i_k)$