Goals:

For part 1

Implement a BST with linked list. 1. Insert a node to the BST. 2. Delete a node from the BST. 3. Search if a node is exist int the BST or not. 4. Print the BST in inorder, preorder, postorder, and postorder. 5. Clear the BST tree.

For part 2

1. Delete the nodes(traps) first.
2. Reach two nodes(sword & Meaty) in shortest path and print out the path.

procedures :

Prat1

1. create struct node to implement link list BST.
2. Build insert(), search(), delete(), preorder(), inorder(), ostorder(), levelorder() function to implement these actions.
3. Design a function free() to free all the nodes in the BST.
4. use swich: to to do the indicated action. And print the message in proper place.

Part2

1. open input file and load the numbers to create a BST.
2. Scan the input informations from command line.
3. Delete the trap's node.
4. Find the road to pick up sword.And then find Meaty.
    4-1. Record the nodes from root to the sword's node, and put it into a stack. In the mean time, record the node's number into an array.
    4-2. Search if the first node pop out from node can reach meaty or not. If not, pop uot next node and do it repetly.
    4-3. Put the node's number into array every time pop out a node from stack.
    4-4. when the node can reach meaty, record the path into the array.

execute result

part1

1. Insert a node to the BST.

2. Delete a node from the BST.

3. Search if a node is exist int the BST or not.

```
(I)nsert a number.
(S)earch a number.
(D)elete a number
(P)rint 4 kinds of order.
(R)eturn.
S
Enter elements to searching : 10 4 24 18 37 5 2 3 1 14 9 -1
Bingo! 10 is found.
SORRY 4 is not found.
Bingo! 24 is found.
Bingo! 18 is found.
Bingo! 37 is found.
SORRY 5 is not found.
SORRY 2 is not found.
Bingo! 3 is found.
Bingo! 1 is found.
SORRY 14 is not found.
Bingo! 9 is found.
(I)nsert a number.
(S)earch a number.
(D)elete a number
(P)rint 4 kinds of order.
(R)eturn.
```

4. Print the BST in inorder, preorder, postorder, and postorder.

```
(I)nsert a number.
(S)earch a number.
(D)elete a number
(P)rint 4 kinds of order.
(R)eturn.
P
The tree in prefix order : 10 6 3 1 9 24 18 37
The tree in infix order : 1 3 6 9 10 18 24 37
The tree in post order : 1 3 9 6 18 37 24 10
The tree in level order : 10 6 24 3 9 18 37 1
```

Part2

```
(base) ~/Documents/110-1(3-1)/資料結構/HW2-Binary Search Tree  main ±  ./bst
(1)Binary searching tree.
(2)Finding Meaty.
(0)Escape and find the meaty next year.
2
Please input the map file:bstmap.txt
Load file success.

Please input the sword's location:6
Please input the Meaty's location:23
Please input the broccoli traps' index(0~9):4
Number 4 is dedeted
Number 14 is dedeted

Capoo successfully found his favorite meaty<3

shortest path to find the meaty :
8->5->6->5->8->15->18->23
```