

FND24

binTree.h

```
1  #include <stdlib.h>
2  #include <stdio.h>
3  typedef struct node{
4      char payload;
5      struct node* right;
6      struct node* left;
7  }Node, *pNode;
8  pNode mallocNode();
9  void freeNode(pNode n);
10 pNode createNode(char payload);
11 pNode addNode(pNode head, char payload);
12 void printnode(char c);
13 void systemicprint(pNode n);
14
```

binTree.c

```

1  #include <stdlib.h>
2  #include <stdio.h>
3  #include "binTree.h"
4
5  pNode mallocNode(){
6      pNode node = (pNode)malloc(sizeof(Node));
7      if(node == (pNode)NULL){
8          return (pNode)NULL;
9      }
10     return node;
11 }
12 void freeNode(pNode node){
13     free(node);
14 }
15 pNode createNode(char payload){
16     pNode pFirst = mallocNode();
17     pFirst->payload = payload;
18     return pFirst;
19 }
20
21 pNode addNode(pNode head, char payload){
22     pNode temp;
23     temp = head;
24     if(temp->right == (pNode)NULL){
25         if(payload > temp->payload){
26             temp->right = mallocNode();
27             temp->right->payload = payload;
28             return temp->right;
29         }
30     }
31     if(temp->left == (pNode)NULL){
32         if(payload < temp->payload){
33             temp->left = mallocNode();
34             temp->left->payload = payload;
35             return temp->left;
36         }
37     }

```

```

37     }
38 }
39
40 void printnode(char c){
41     printf("%c\n", c);
42 }
43 void systemicprint(pNode node){
44     if(node != (pNode)NULL){
45         systemicprint(node->left);
46         printnode(node->payload);
47         systemicprint(node->right);
48     }
49 }
50

```

Test

```

1  #include <stdio.h>
2  #include <stdlib.h>
3  #include "binTree.h"
4
5  int main(){
6      char m = 'm';
7      char n = 'n';
8      char o = 'o';
9      Node* root = createNode(n);
10     Node* l = addNode(root, m);
11     Node* r = addNode(root, o);
12     printf("Ordered BINTREE \n");
13     systemicprint(root);
14     freeNode(l);
15     freeNode(root);
16     freeNode(r);
17     return EXIT_SUCCESS;
18 }
19

```

```
[mmoustaf@gc112m38 fnd24]$ gcc -o fnd24 main.c binTree.c
[mmoustaf@gc112m38 fnd24]$ ./fnd24
Ordered BINTREE
m
n
o
-
```