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Data structure Homework

Experiment Part

Session3-Part1

Create a linked list. Enter the data from the keyboard
(Tail insertion).

```
1  #include <stdio.h>
2  #include <stdlib.h>
3
4  struct node
5  {
6      int num;                //Data of the node
7      struct node *nextptr;   //Address of the node
8  }*stnode;
9
10 void createNodeList(int n); //function to create the list
11 void NodeInsertatEnd(int num); //function to insert node at the end
12 void displayList();        //function to display the list
13
14 int main()
15 {
16     int n,num;
17     printf("\n\n Linked List : Insert a new node at the end of a Singly Linked List :\n");
18     printf(" Input the number of nodes : ");
19     scanf("%d", &n);
20     createNodeList(n);
21     printf("\n Data entered in the list are : \n");
22     displayList();
23     printf("\n Input data to insert at the end of the list : ");
24     scanf("%d", &num);
25     NodeInsertatEnd(num);
26     printf("\n Data, after inserted in the list are : \n");
27     displayList();
28     return 0;
29 }
```

```

30 void createNodeList(int n)
31 {
32     struct node *fnNode, *tmp;
33     int num, i;
34     stnode = (struct node *)malloc(sizeof(struct node));
35     if(stnode == NULL) //check whether the stnode is NULL and if so no memory allocation
36     {
37         printf(" Memory can not be allocated.");
38     }
39     else
40     {
41         // reads data for the node through keyboard
42         printf(" Input data for node 1 : ");
43         scanf("%d", &num);
44
45         stnode-> num = num;
46         stnode-> nextptr = NULL; //Links the address field to NULL
47         tmp = stnode;
48         //Creates n nodes and adds to linked list
49         for(i=2; i<=n; i++)
50         {
51             fnNode = (struct node *)malloc(sizeof(struct node));
52             if(fnNode == NULL) //check whether the fnNode is NULL and if so no memory allocation
53             {
54                 printf(" Memory can not be allocated.");
55                 break;
56             }
57             else
58             {
59                 printf(" Input data for node %d : ", i);
60                 scanf(" %d", &num);
61                 fnNode->num = num; // links the num field of fnNode with num
62                 fnNode->nextptr = NULL; // links the address field of fnNode with NULL
63                 tmp->nextptr = fnNode; // links previous node i.e. tmp to the fnNode
64                 tmp = tmp->nextptr;
65             }
66         }
67     }
68 }
69
70 void NodeInsertatEnd(int num)
71 {
72     struct node *fnNode, *tmp;
73     fnNode = (struct node *)malloc(sizeof(struct node));
74     if(fnNode == NULL)
75     {
76         printf(" Memory can not be allocated.");
77     }
78     else
79     {

```

```

80         fnNode->num = num; //Links the data part
81         fnNode->nextptr = NULL;
82         tmp = stnode;
83         while(tmp->nextptr != NULL)
84             tmp = tmp->nextptr;
85         tmp->nextptr = fnNode; //Links the address part
86     }
87 }
88
89 void displayList()
90 {
91     struct node *tmp;
92     if(stnode == NULL)
93     {
94         printf(" No data found in the empty list.");
95     }
96     else
97     {
98         tmp = stnode;
99         while(tmp != NULL)
100         {
101             printf(" Data = %d\n", tmp->num); // prints the data of current node
102             tmp = tmp->nextptr; // advances the position of current node
103         }
104     }
105 }
106

```

Result:

Output will be

```

"E:\Home Work\DS&A\Incart_Node_in_tail\bin\Debug\Incart_Node_in_tail.exe"

Linked List : Insert a new node at the end of a Singly Linked List :
Input the number of nodes : 3
Input data for node 1 : 2
Input data for node 2 : 5
Input data for node 3 : 1

Data entered in the list are :
Data = 2
Data = 5
Data = 1

Input data to insert at the end of the list : 8

Data, after inserted in the list are :
Data = 2
Data = 5
Data = 1
Data = 8

Process returned 0 (0x0)   execution time : 24.421 s
Press any key to continue.

```