2019A7PS0020U Dhruv Maheshwari

Lab 5

Ques 1:

Function	Big O

struct student
{
    char rollNo[20];
    char emailId[35];
    char lecture[3];
    char tutorial[3];
    char practical[3];
    struct student*next;
};
	O(1)[declaration]

struct student*createNode(struct student buffer)
{
    struct student*ptr=(struct student*)malloc(sizeof(struct student));
 	
    strcpy(ptr->rollNo,buffer.rollNo);
    strcpy(ptr->emailId,buffer.emailId);
    strcpy(ptr->lecture,buffer.lecture);
    strcpy(ptr->tutorial,buffer.tutorial);
    strcpy(ptr->practical,buffer.practical);
 	
    ptr->next=NULL;
    return ptr;
}
	O(1)[memory allocation]
	
	O(1)[strcpy function]
	
	O(1)[making ptr next to null]
	O(1)[return stmt]
	O(1)

int insertNode(struct student**startPtr,struct student*temp)
{
    if(*startPtr==NULL)
    {
        *startPtr=temp;
        return 1;
    }
    struct student*iterator=*startPtr;
    while(iterator->next!=NULL)
    {
        if(strcmp(iterator->rollNo,temp->rollNo)==0)
            return 0;
        iterator=iterator->next;
    }
    if(strcmp(iterator->rollNo,temp->rollNo)==0)
        return 0;
    iterator->next=temp;
    return 1;
	O(1)[comparison]
	
	O(1)[assignment]
	O(1)[return]
	
	O(1)[declaration, assignment]
	O(n)[traversing the linked list till the end]
	
	n*O(1)[comparison, comparison]
	
	n*O(1)[return]
	n*O(1)[making iterator point to next iterator position]
	O(1)[comparison, comparison]
	
	O(1)[return]
	O(1)[making iterator point to location of temp]
	O(1)[return]

}	**O(n)**

int deleteNode(struct student**ptr,char rollNumber[20])
{
  struct student *old,*temp;
  temp= *ptr;
  while(temp!=NULL)
  {
    if(strcmp(temp->rollNo,rollNumber)==0)
    {
       if(temp== *ptr)
       {
        *ptr=temp->next;
        free(temp);
        return 1;
       }
       else
       {
        old->next=temp->next;
        free(temp);
        return 1;
       }
    }
    else
    {
       old=temp;
       temp=temp->next;
    }
  }
  return 0;
}
	O(1)[declaration]
	O(1)[assignment]
	O(n)[traversing the linked list till the end]
	
	n*O(1)[comparison, comparison]
	
	all the statements will take atmost n*O(1) time for execution
	
	O(n)

int searchNode(struct student*ptr,char rollNumber[20])
{
struct student *temp = ptr;
int index=1;
  while(temp != NULL)
  {
    if(strcmp(temp->rollNo,rollNumber)==0)
    {
      return index;
    }
    else
    {
     temp = temp->next;
    index++;
    }
  }
  return 0;
}
	O(1)[declaration, assignment]
	O(1)[declaration, assignment]
	O(n)[traversing the linked list till the end]
	
	all the statements will take atmost n*O(1) time for execution
	
	O(n)

int displayList(struct student*start)	

{
int count=0;
struct student *temp=start;
 	
while(temp!=NULL)
{
    printf("\nRoll Number: %s \tEmail ID: %s", temp->rollNo, temp->emailId);
    temp=temp->next;
    count++;
}
return count;
}
	O(1)[declaration, assignment]
	O(1)[declaration, assignment]
	
	O(n)[traversing the linked list till the end]
	
	all the statements will take atmost n*O(1) time for execution
	
	O(1)
	O(n)

Ques 2:

Function	Big O

int push(struct student**top,struct student* temp) {
  if(*top==NULL) {
        *top = temp;
        return 1;
    }
    temp->next = *top;
    *top = temp;
}
	
	O(1)[comparison]
	O(1)[assignment]
	O(1)[return stmt]
	
	O(1)[accessing location, assignment to temp]
	O(1)[assigning location of temp to *temp]
	O(1)

struct student* pop(struct student**top) {
  if(*top == NULL) {
    return NULL;
    }
	
	O(1)[comparison]
	O(1)[return stmt]

struct student* temp = *top;
*top = temp->next;
return temp;
};
	O(1)[declaration, assignment]
	O(1)[assigning location of temp->next to
	*linked list, return stmt]
	O(1)

```
Telnet 172.16.22.5
Deletion successfull 2019A7PS0006U successfully removed
Deletion successfull 2019A7PS0246U successfully removed
Details for 2019A7PS0134U successfully inserted
Deletion successfull 2019A7PS0134U successfully removed
Deletion successfull 2019A7PS0253U successfully removed
Details for 2019A7PS0256U successfully inserted
Deletion successfull 2019A7PS0256U successfully removed
Details for 2019A7PS0028U successfully inserted
Details for 2019A7PS0240U successfully inserted
Deletion successfull 2019A7PS0240U successfully removed
Details for 2019A7PS0246U successfully inserted
Details for 2019A7PS0051U successfully inserted
Details for 2019A7PS0087U successfully inserted
Details for 2019A7PS0091U successfully inserted
Deletion successfull 2019A7PS0091U successfully removed
Deletion successfull 2019A7PS0087U successfully removed
Details for 2019A7PS0219U successfully inserted
Deletion successfull 2019A7PS0219U successfully removed
Deletion successfull 2019A7PS0051U successfully removed
Details for 2019A7PS0119U successfully inserted
Details for 2019A7PS0243U successfully inserted
Details for 2019A7PS0146U successfully inserted
Details for 2019A7PS0215U successfully inserted
Details for 2019A7PS0077U successfully inserted
Details for 2019A7PS0064U successfully inserted
Deletion successfull 2019A7PS0064U successfully removed
Deletion successfull 2019A7PS0077U successfully removed
Deletion successfull 2019A7PS0215U successfully removed
Deletion successfull 2019A7PS0146U successfully removed
Details for 2019A7PS0058U successfully inserted
Details for 2019A7PS0187U successfully inserted
Deletion successfull 2019A7PS0187U successfully removed
Details for 2019A7PS0239U successfully inserted
Deletion successfull 2019A7PS0239U successfully removed
Details for 2019A7PS0026U successfully inserted
Deletion successfull 2019A7PS0026U successfully removed
Deletion successfull 2019A7PS0058U successfully removed
Details for 2019A7PS0088U successfully inserted
Deletion successfull 2019A7PS0088U successfully removed
Details for 2019A7PS0123U successfully inserted
[2019A7PS0020U@linuxbpdc1 Week_05]$
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