

DATA STRUCTURE PROJECT

“EMPLOYEE RECORD MANAGEMENT SYSTEM USING LINKED LIST”

For Student :

Raghad Hassan Ali

ID :

2006601

Prepear for :

Dr. Najat Alsaiari

PICTURE OF THE NODE CLASS

Public node class that contain the required items which is :

- *Name of Employee
- *ID of Employee
- *First day of work
- *Phone number of the employee
- *Address of the employee
- *Work hours
- *Salary

```
C: > Users > ragha > Untitled-2.cpp > ...
1  #include <iostream>
2  #include <string>
3
4  using namespace std;
5  class node
6  {
7      public:
8          node* next;
9          int idNumber, firstDay;
10         double salary;
11         int phoneNumber, workHours;
12         string empName;
13         string address;
14     };
15
16     //This is needed to use it at all method
17     node* head = NULL;
18
```

PICTURE OF THE FIRST METHOD

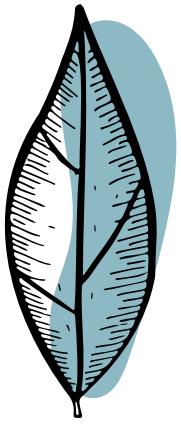
Check Record Method :

```
20 //-----CHECK METHOD
21 bool checkRecord (int idNumber)
22 {
23     node* temp = head;
24     //if the head equal to NULL this meaning that the the list is empty and no records
25     if (temp == NULL)
26         //false meaning this record is not exist in the list
27         | return false;
28     //while the list in not empty and have records
29     while (temp != NULL)
30     {
31         //check the ID number
32         | if (temp->idNumber == idNumber)
33         //if it's exist return true, meaning yes this record is exist in the list
34         | | return true;
35         //otherwise, keep traversing
36         | temp = temp->next;
37     }
38     return false;
39 }
40
```

PICTURE OF THE SECOND METHOD

Search Record Method :

```
90 //-----SEARCH METHOD
91 void searchRecord(int idNumber)
92 {
93     node* record = head;
94     //printing message to inform user that the record is not found
95     if (record == NULL || record->idNumber != idNumber)
96     | cout << "Record NOT found !!" << endl;
97     //while the head is not equal to NULL meaning there is a records to search
98     while (record != NULL)
99     {
100         //if the ID number is match, so we found the record
101         if (record->idNumber == idNumber)
102         {
103             cout << "Record is FOUND ... " << endl;
104             //printing record's informations
105             cout << "Employee ID Number : " << record->idNumber << endl;
106             cout << "Employee Name : " << record->empName << endl;
107             cout << "Employee Phone Number : " << record->phoneNumber << endl;
108             cout << "Employee Address : " << record->address << endl;
109             cout << "Employee First Work Day : " << record->firstDay << endl;
110             cout << "Employee Salary : " << record->salary << endl;
111             cout << "Employee Work Hours : " << record->workHours << endl;
112         }
113         //if the ID number is not match, keep traversing
114         record = record->next;
115     }
116 }
```



PICTURE OF THE THIRD METHOD

Create Record Method :

```
40 //-----INSERT METHOD
41 void createRecord(int idNumber, string empName, int phoneNumber,
42 |   string address, int firstDay, double salary, int workHours)
43 {
44     //based on the return value from checkRecord method, if it's true this meaning the record is already exist
45     if (checkRecord(idNumber))
46     {
47         cout<< "This employee is already exist in the records!" << endl;
48         return;
49     }
50     //otherwise, meaning the record with this ID number doesn't exist and it's allow to insert it
51     node* newRecord = new node();
52     newRecord->next = NULL;
53     newRecord->idNumber = idNumber;
54     newRecord->empName = empName;
55     newRecord->phoneNumber = phoneNumber;
56     newRecord->address = address;
57     newRecord->firstDay = firstDay;
58     newRecord->salary = salary;
59     newRecord->workHours = workHours;
60     //SORTED INSERTING PROCESS
61     //When the list is empty or we want to insert id equal or smaller than the id exist already
62     if (head == NULL || head->idNumber >= newRecord->idNumber)
63     {
64         newRecord->next = head;
65         head = newRecord;
66         cout << "Employee Record Is Inserted Successfully ..\n" << endl;
67         cout << "-----\n";
68         return;
69     }
70     //inserting the node record in the middle or the end of the list
71     else
72     {
73         node* current = head;
74         while (current->next != NULL && current->next->idNumber < newRecord->idNumber)
75         {
76             //while the list is NOT empty and the new exist id is smaller than the new one
77             //keep traversing
78             current = current->next;
79         }
80         //locate the new record after the above condition is broken
81         newRecord->next = current->next;
82         current->next = newRecord;
83         cout << "Employee Record Is Inserted Successfully ..\n" << endl;
84         cout << "-----\n";
85     }
86 }
87
88 }
```



PICTURE OF THE FOURTH METHOD

Update Salary Method :

```
174 //-----SALARY UPDATE METHOD
175 int updateSalary(int idNumber)
176 {
177     node* record = head;
178     //while the list have records and not empty
179     while (record != NULL)
180     {
181         // check if there is match on idNumber
182         if (record->idNumber==idNumber)
183         {
184             //check the working hours, if it's more than 32 hours, do calculations
185             if (record->workHours > 32)
186             {
187                 double salary, overtime, newSalary;
188                 int workHours;
189                 workHours = record->workHours - 32;
190                 overtime = workHours* (record->salary * 0.02);
191                 newSalary = record->salary + overtime;
192                 record->salary = newSalary;
193                 cout<<"Salary is updated Successfully..\n";
194                 cout << "The new salary is : ";
195                 record->salary=newSalary;
196                 return newSalary;
197             }
198             //otherwise, if it's less than 32 hours CANT update the salary
199             if (record->workHours <32)
200             {
201                 cout<<"Sorry CANT update salary for this employee\n"
202                 <<"Because the working hours are less than 32 hours..\n"
203                 <<"So the salary is still : ";
204                 return record->salary;
205             }
206         }
207         //otherwise, meaning no matchs
208         if (record->idNumber != idNumber)
209         {
210             cout<<"There is NO employee record for this ID !!"<<endl;
211             return -1;
212         }
213         //Keep traversing until find the matchs ID
214         record = record->next;
215     }
216     return -1;
217 }
```

PICTURE OF THE FIFTH METHOD

Delete Record Method :

```
118 //-----DELETE METHOD
119 int deleteRecord(int idNumber)
120 {
121     node* record2del;
122     node* temp = head;
123     //if the we found the record to delete at the beginning
124     if (temp != NULL && temp->idNumber == idNumber)
125     {
126         //head will point to the next of the temp
127         head = temp->next;
128         //delete temp from memory
129         free(temp);
130         cout << "Employee Record Is Deleted Successfully ..\n" << endl;
131         cout << "-----\n";
132         return 0;
133     }
134     //if the record to delete is in the middle or in the end
135     while (temp->next != NULL)
136     {
137         if (temp->next->idNumber == idNumber)
138         {
139             record2del = temp->next;
140             temp->next = temp->next->next;
141             free(record2del);
142             cout << "Employee Record Is Deleted Successfully ..\n" << endl;
143             cout << "-----\n";
144             return 0;
145         }
146         temp = temp->next;
147     }
148     //otherwise, ID number to delete is not found
149     cout << "ID number to delete is not found" << endl;
150     return -1;
151 }
```

PICTURE OF THE SIXTH METHOD

Show Record Method :

```
153 //-----DISPLAY METHOD
154 void showRecord()
155 {
156     node* record = head;
157     //if the record equal to NULL meaning that the list is empty
158     if (record == NULL)
159     {
160         cout << "NO records is found" << endl;
161     }
162     //otherwise, meaning that the list have records
163     while (record != NULL)
164     {
165         cout << "Employee ID Number : " << record->idNumber << endl;
166         cout << "Employee Name : " << record->empName << endl;
167         cout << "Employee Phone Number : " << record->phoneNumber << endl;
168         cout << "Employee Address : " << record->address << endl;
169         cout << "Employee First Work Day : " << record->firstDay << endl;
170         cout << "Employee Salary : " << record->salary << endl;
171         cout << "Employee Work Hours : " << record->workHours << endl;
172         record = record->next;
173     }
174 }
```

PICTURE OF THE MAIN

```
219 //-----  
220 int main()  
221 {  
222     int idNumber, firstDay, salary, idNumber2del;  
223     int phoneNumber, workHours, choice = 1;  
224     string empName;  
225     string address;  
226  
227     cout << "\n-----EMPLOYEE RECORD MANAGEMENT SYSTEM-----" << endl;  
228     //while the user choice is not equal to 6, because 6 meaning Exit  
229     while (choice != 6)  
230     {  
231         //keep printing the options list  
232         cout << "\n*****OPTIONS LIST*****\n" << endl;  
233         cout << "Please Choose Your Option : " << endl;  
234         cout << "1. Insert Employee Record \n2. Delete Employee Record \n"  
235             << "3. Show Employee Record \n4. Search Employee Record\n"  
236             << "5. Update Salary \n6. Exit \nYour choice : ";  
237         cin >> choice;  
238  
239         //if the user choose 1 meaning he want to insert new record  
240         if (choice == 1)  
241         {  
242             cout << "Enter the ID of employee : ";  
243             cin >> idNumber;  
244             // calling checkRecord method to check the id number if it's exist or not  
245             if (checkRecord(idNumber) == false)  
246             {  
247                 //if the method return false meaning the id number is not exist  
248                 //so keep taking the rest of information from user  
249                 cout << "Enter the name of employee : ";  
250                 cin >> empName;  
251                 cout << "Enter the phone number of the employee : ";  
252                 cin >> phoneNumber;  
253                 cout << "Enter the address of the employee : ";  
254                 cin >> address;  
255                 cout << "Enter the first day of the work : ";  
256                 cin >> firstDay;  
257                 cout << "Enter the salary : ";  
258                 cin >> salary;  
259                 cout << "Enter the work hours : ";  
260                 cin >> workHours;  
261                 createRecord(idNumber, empName, phoneNumber, address,  
262                     | firstDay, salary, workHours);  
263             }  
264             //otherwise meaning the method returned true so the id number is already exist  
265             else  
266             {  
267                 cout << "This employee is already exist in the records!\n";  
268             }  
269         }  
270  
271         //if the user choose 2 meaning he want to delete a record  
272         if (choice == 2)  
273         {  
274             cout << "Enter the ID of employee you want to delete : ";  
275             cin >> idNumber2del;  
276             deleteRecord(idNumber2del);  
277         }  
278  
279         //if the user choose 3 meaning he want to display all records  
280         if (choice == 3)  
281         {  
282             showRecord();  
283         }  
284  
285         //if the user choose 4 meaning he want to search a record  
286         if (choice == 4)  
287         {  
288             searchRecord();  
289         }  
290  
291         //if the user choose 5 meaning he want to update a record  
292         if (choice == 5)  
293         {  
294             updateRecord();  
295         }  
296  
297         //if the user choose 6 meaning he want to exit  
298         if (choice == 6)  
299         {  
300             cout << "Thank you for using our Employee Record Management System!";  
301             cout << endl;  
302         }  
303     }  
304 }
```



PICTURE OF THE MAIN

```
285     //if the user choose 4 meaning he want to search for specific record
286     if (choice == 4)
287     {
288         cout<< "Enter the ID of employee you want to search : ";
289         cin>> idNumber;
290         searchRecord(idNumber);
291     }
292
293     //if the user choose 5 meaning he want to update the salary for specific record
294     if (choice == 5)
295     {
296         cout<<"Enter the ID of employee you want to update salary for : ";
297         cin>>idNumber;
298         cout<<updateSalary(idNumber)<<"\n";
299     }
300
301     //if the user choose 6 meaning he want to exist the program
302     if (choice == 6)
303     {
304         cout << "\nTHANK YOU, GOOD BYE !!";
305         exit(0);
306     }
307
308     //otherwise, meaning the user choose wrong choice
309     if (choice != 1 && choice !=2 && choice != 3 && choice != 4 &&
310         choice != 5 && choice != 6 )
311         cout<<"WRONG CHOICE, TRY AGAIN !!"<<endl;
312     }
313     return 0;
314 }
```

PICTURE OF THE OUTPUT

```
-----EMPLOYEE RECORD MANAGEMENT SYSTEM-----
*****OPTIONS LIST*****
Please Choose Your Option :
1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit
Your choice : 1
Enter the ID of employee : 5
Enter the name of employee : Raghad
Enter the phone number of the employee : 0553611963
Enter the address of the employee : Jeddah
Enter the first day of the work : 04
Enter the salary : 9500
Enter the work hours : 45
Employee Record Is Inserted Successfully ..
```

```
*****OPTIONS LIST*****
Please Choose Your Option :
1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
```

PICTURE OF THE OUTPUT

Please Choose Your Option :

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

Your choice : 3

Employee ID Number : 5

Employee Name : Raghad

Employee Phone Number : 553611963

Employee Address : Jeddah

Employee First Work Day : 14

Employee Salary : 9500

Employee Work Hours : 54

*****OPTIONS LIST*****

Please Choose Your Option :

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

Your choice : 2

Enter the ID of employee you want to delete : 5

Employee Record Is Deleted Successfully ..

PICTURE OF THE OUTPUT

4. Search Employee Record

5. Update Salary

6. Exit

Your choice : 1

Enter the ID of employee : 4

Enter the name of employee : Hanan

Enter the phone number of the employee : 504690461

Enter the address of the employee : Makkah

Enter the first day of the work : 12

Enter the salary : 8300

Enter the work hours : 25

Employee Record Is Inserted Successfully ..

*****OPTIONS LIST*****

Please Choose Your Option :

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

Your choice : 5

Enter the ID of employee you want to update salary for : 4

Sorry CANT update salary for this employee

Because the working hours are less than 32 hours..

So the salary is still : 8300

PICTURE OF THE OUTPUT

```
*****OPTIONS LIST*****
```

Please Choose Your Option :

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

Your choice : 3

Employee ID Number : 2

Employee Name : Hanan

Employee Phone Number : 504690461

Employee Address : Makkah

Employee First Work Day : 10

Employee Salary : 4500

Employee Work Hours : 20

Employee ID Number : 5

Employee Name : Raghad

Employee Phone Number : 553611963

Employee Address : Jeddah

Employee First Work Day : 5

Employee Salary : 6000

Employee Work Hours : 35

PICTURE OF THE OUTPUT

```
*****OPTIONS LIST*****
```

Please Choose Your Option :

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

Your choice : 4

Enter the ID of employee you want to search : 2

Record is FOUND ...

Employee ID Number : 2

Employee Name : Hanan

Employee Phone Number : 504690461

Employee Address : Makkah

Employee First Work Day : 10

Employee Salary : 4500

Employee Work Hours : 20

```
*****OPTIONS LIST*****
```

Please Choose Your Option :

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record

PICTURE OF THE OUTPUT

```
Employee ID Number : 2
Employee Name : Hanan
Employee Phone Number : 504690461
Employee Address : Makkah
Employee First Work Day : 10
Employee Salary : 4500
Employee Work Hours : 20
```

```
*****OPTIONS LIST*****
```

```
Please Choose Your Option :
```

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

```
Your choice : 4
```

```
Enter the ID of employee you want to search : 8
```

```
Record NOT found !!
```

```
*****OPTIONS LIST*****
```

```
Please Choose Your Option :
```

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

PICTURE OF THE OUTPUT

```
*****OPTIONS LIST*****
```

```
Please Choose Your Option :
```

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

```
Your choice : 2
```

```
Enter the ID of employee you want to delete : 9
```

```
ID number to delete is not found
```

```
*****OPTIONS LIST*****
```

```
Please Choose Your Option :
```

1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit

```
Your choice : 2
```

```
Enter the ID of employee you want to delete : 2
```

```
Employee Record Is Deleted Successfully ..
```

PICTURE OF THE OUTPUT

```
1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit
Your choice : 3
Employee ID Number : 5
Employee Name : Raghad
Employee Phone Number : 553611963
Employee Address : Jeddah
Employee First Work Day : 5
Employee Salary : 6000
Employee Work Hours : 35
```

```
*****OPTIONS LIST*****
```

```
Please Choose Your Option :
1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit
Your choice : 5
Enter the ID of employee you want to update salary for : 5
Salary is updated Successfully..
The new salary is : 6360
```

PICTURE OF THE OUTPUT

```
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit
Your choice : 3
Employee ID Number : 5
Employee Name : Raghad
Employee Phone Number : 553611963
Employee Address : Jeddah
Employee First Work Day : 5
Employee Salary : 6360
Employee Work Hours : 35
```

```
*****OPTIONS LIST*****
```

```
Please Choose Your Option :
1. Insert Employee Record
2. Delete Employee Record
3. Show Employee Record
4. Search Employee Record
5. Update Salary
6. Exit
Your choice : 6
```

```
THANK YOU, GOOD BYE !!
```

```
...Program finished with exit code 0
Press ENTER to exit console.
```