



**National University of Computer & Emerging  
Sciences, Karachi Campus  
Fall 2022**



**Project Report**

**Data Structures**

**Section: BCS-3K**

**Mobile Phone Directory**

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# **Mobile Phone Directory**

## **Project Objective**

This project allows user to create phone directory and perform operations quickly that involves functions like Add, Search, Modify or Delete Contact, etc. The above-mentioned operations are maintained through file handling.

## **Data Structures Concepts**

The directory is created through binary search tree so that data is stored in lexicographical manner which ensures to minimise insertion, search and delete time complexity.

Stack is implemented for efficient memory allocation.

Filing is used to read each contact information that needs to be processed and to write the results of the processing in an organised manner.

## **Main Functions**

- Contact numbers are added to the phone's directory and sorted alphabetically in ascending order.
- The existing contacts could be altered and updated in the list.
- Deletes a particular contact from the list
- Allows you to search through your directory for a contact by name.
- Gives list of contacts that are frequently contacted by adding it to the favourites record file.

## Workflow

Classes:

- Phone
- Node

An object of the phone class is created in the main and its directory function is called which displays the main menu and takes user's choice as input.

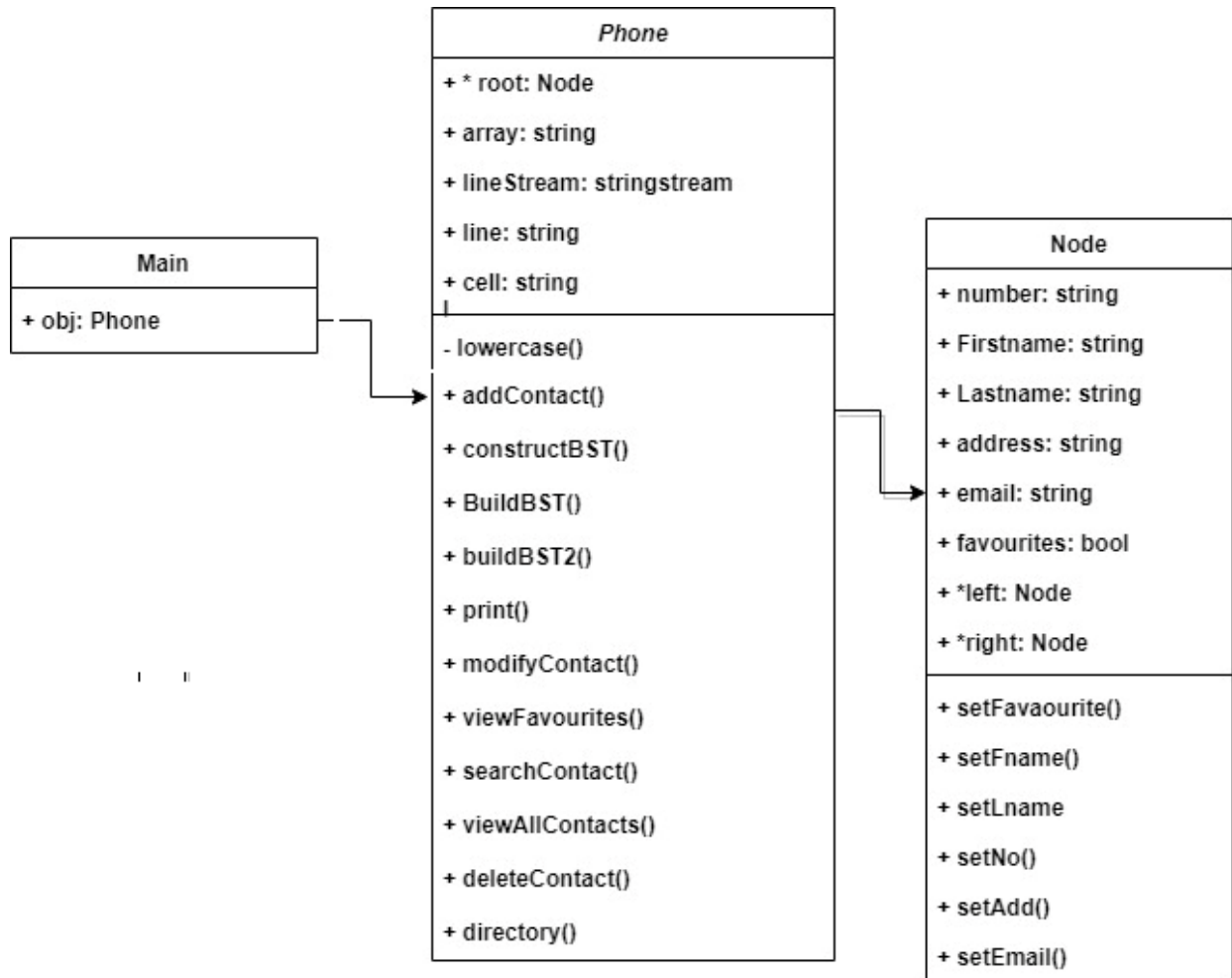
```
void directory()
{
    cout << endl << "\t\t\tWelcome to the Main Menu" << endl;
    cout << endl
    << "#*****#" << endl
    << endl;
    cout << "1. Add contact" << endl
    << "2. Modify contact" << endl
    << "3. Delete contact" << endl
    << "4. Search contact" << endl
    << "5. View favourites" << endl
    << "6. View all contacts" << endl;
    cout << "Enter your choice: ";
    cin >> choice;
```

Through the switch case desired function is called.

```
void addContact() { ... }
void modifyContact(string arr, Node* r, string arr2) { ... }
Node* deleteContact(Node* r, string name, string lname) { ... }
void searchContact(Node* r, string arr) { ... }
void viewFavourites() { ... }
void viewAllContacts(Node* r) { ... }
```

The phone class has node class's object as a data member which is used to create the record of each node of BST.

# UML Class Diagram



# Output snippet

- Add Contact

```

Welcome to the Main Menu

#####

1. Add contact
2. Modify contact
3. Delete contact
4. Search contact
5. View favourites
6. View all contacts
Enter your choice: 1
Enter first and last name, number, address and email: Aqsa
Shahbaz
03324334554
GHQ234
k214511@nu.edu.pk

```

	A	B	C	D	E	F	G
2	Sareem	Farooqui	03443526622UHG736		Sareem@gmail.com		
3	Kuljeet	Khatri	03662662606YTR535		kuljeet@gmail.com		
4	Kabeer		03255353521IU723		Kabeer@gmail.com		
5	Zohaib	Saqib	03244207616OIU765		Zohaib@gmail.com		
6	Aqsa	Shahbaz	03213425544rety474		Aqsa@gmail.com		
7	Neha	Ahmed	03425512314SWQ366		Neha@gmail.com		
8	Rabia	Sundus	03323432321RWQ231		Rabia@gmail.com		
9	Hajra	Mutaal	03215353441JHQ123		Hajra@gmail.com		



Record.csv before deletion of record "Anees Syed"

---

Record

<b>Sareem</b>	<b>Farooqui</b>	<b>577293849</b>	<b>RiyadhKSA</b>	<b><u>xyz@abc.com</u></b>
<b>Zainab</b>	Fatima	3178293020	KarachiPak	<u>abc.xyz.com</u>
<b>Anees</b>	Syed	966529201030	JeddahKSA	<u>xyz@yahoo.com</u>

Record.csv after deletion of record "Anees Syed"

---

Record

<b>Sareem</b>	<b>Farooqui</b>	<b>577293849</b>	<b>RiyadhKSA</b>	<b><u>xyz@abc.com</u></b>
<b>Zainab</b>	Fatima	3178293020	KarachiPak	<u>abc.xyz.com</u>

Favourites.csv before deletion of record "Anees Syed"

---

Favourites

<b>Sareem</b>	<b>Farooqui</b>	<b>577293849</b>	<b>RiyadhKSA</b>	<b><u>xyz@abc.com</u></b>
<b>Anees</b>	Syed	966529201030	JeddahKSA	<u>xyz@yahoo.com</u>

Favourites.csv after deletion of record "Anees Syed"

---

#### Favourites

Sareem	Farooqui	577293849	RiyadhKSA	xyz@abc.com
--------	----------	-----------	-----------	-------------

#### ● Search Contact

```
Welcome to the Main Menu

#####

1. Add contact
2. Modify contact
3. Delete contact
4. Search contact
5. View favourites
6. View all contacts
Enter your choice: 4

Enter the first name of the contact person: Makisa
First Name: Makisa
Last Name: Imtiaz
Cell No. 3343694739
Address: XYZ10
Email: k214506@nu.edu.pk
```

First Name	Last Name	No.	Address	Email
Makisa	Imtiaz	3343694739	XYZ10	makisa@gmail.com
Zohaib	Saqib	3244207616	OIU765	Zohaib@gmail.com
Aqsa	Shahbaz	3213425544	rety474	Aqsa@gmail.com



- **View Favourites**

Microsoft Word Doc... 1.188 KB

Favourites - Excel

File Home Insert Page Layout Formulas Data Review View Help Share

A1 X ✓ fx Makisa

	A	B	C	D	E	F	G
1	Makisa	Imtiaz	3343694739	XYZ10	makisa@gmail.com		
2	Zohaib	Saqib	3244207616	OIU765	Zohaib@gmail.com		
3	Aqsa	Shahbaz	3213425544	rety474	Aqsa@gmail.com		
4							
5							
6							

Favourites

- **View all contacts**

C:\Users\HP\Downloads\Project23.exe

```

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Aqsa Shahbaz
Hajra Mutaal
Kabeer
Kuljeet Khatri
Makisa Imtiaz
Neha Ahmed
Rabia Sundus
Sareem Farooqui
Zohaib Saqib
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