College of Computer and Information Sciences

CS 212: Data structure

Phone Book Report – Part 2 [BST]

Section #55027

Student Name
Leader:Renad Alotaibi
Ghazlan aldosari
Lena alhabdan

1.command line menu functionality description

- **addContact()**

Method Input: The method asks the user to enter elements for making a new contact.

Enters: Contact’s Name, Contact’s Phone Numbe, Contact's E-mail Address, Contact’s Address, Contact’s Birthday, Notes for the Contact.

Method Output: The method doesn't deliver a direct output that is returned. Instead, it prints messages to the console based on the actions it took.

Method Functionality:

The method verifies the existence of a contact by considering the provided name and phone number. It ensures that there is no redundancy in information. If a contact sharing the same name and phone number is identified, the method displays the message "Contact found!" to notify the user.

1. User Input for Contact Details: The method requests the user to provide information such as name, phone number, email address, birthday, and notes for the creation of a new contact.
2. Transformation of Input Birthday: The method transforms the input birthday into a Date object.
3. Generation of Contact Object: A new Contact object (c) is generated using the given information.
4. Contact Inserted: The new contact is added to binary search tree (BST) called "contacts" using the insert method.
5. Output Notifies: If the insertion process is successful, the console displays the message "Contact added successfully!

- **searchContact()**

Method Input:

Input: The method asks the user to input a search criteria choice [1 to 5]and the needed information based on the chosen criteria.

Output: The method prints messages indicating whether the contact was found or not, and it prints the details of the found contact.

Method Functionality:

1. User Input: The method guides the user to select a search criterion (name, phone number, email, address, or birthday) and asks them to provide the needed details.

2. Contact Query: Using the chosen criterion and input information, the method looks for the contact within the (BST) contacts. Distinct search methods are employed based on the selected criterion.

3. Output Notification: If the contact is located, it displays "Contact found!" on the console. In the absence of contact, it communicates "Contact not found!".

4. Contact Information: In the event of finding the contact, the method prints the contact's details to the console.

- **deleteContact()**

  input: the user enters the name of the contact to be deleted.

  Output: The method prints a success message, and the details of the deleted contact are displayed,If the specified contact is not found in the contact list, it prints an error message.

Method Functionality:

1. Create a new Contact instance using the provided name.

2. Verify that the contact list (contacts) is not empty, and the specified contact exists.

3. If the contact is found, remove it from the contact list.

- Handle Events:

3.1: Iterate through the events linked list for the deleted contact.

3. 2: For each associated event:

3. 3: Confirm the event's presence in the global events list (events).

3. 4: If the event is found:

3. 5: Eliminate the deleted contact from the event's list of associated contacts.

3. 6: If the event no longer has any associated contacts, remove it from the events list.

- **scheduleEvent()**

Input: Guides the user in selecting between scheduling an event or an appointment. Collects necessary details including title, contacts, date, time, and location.

Output: Provides informative messages on the outcome of the scheduling process, notifying the user about success or failure. Raises alerts for conflicts or if a specified contact cannot be found.

Method Functionality:

• Processing an event:

1. Gathers information including the event title, contacts' names (comma-separated), date, time, and location.
2. Verifies conflicts with existing events for each contact.
3. If conflict-free, link the event with the contacts and updates both the contact and global events lists.

• Processing an appointment:

1. Collects details like the appointment title, contact name, date, time, and location.
2. Examines for conflicts with existing events.
3. If no conflicts arise, associate the appointment with the contact and update both the contact and global events lists.

- **printEvent()**

input: Choose search criteria [contact name or event title]to print.

Output: Print events associated with the specified contact or event title.

Method Functionality:

1. Takes user input for search criteria.
2. Print events based on the chosen criteria.
3. Handles cases where contacts or events are not found prints out “not found!”.

- **printContactsFirstName()**

Input: user enters First name for contact search.

Output: Print contacts found by the first name.

Method Functionality:

1. Takes user input for a first name.
2. Searches and prints contact that first names match the input.

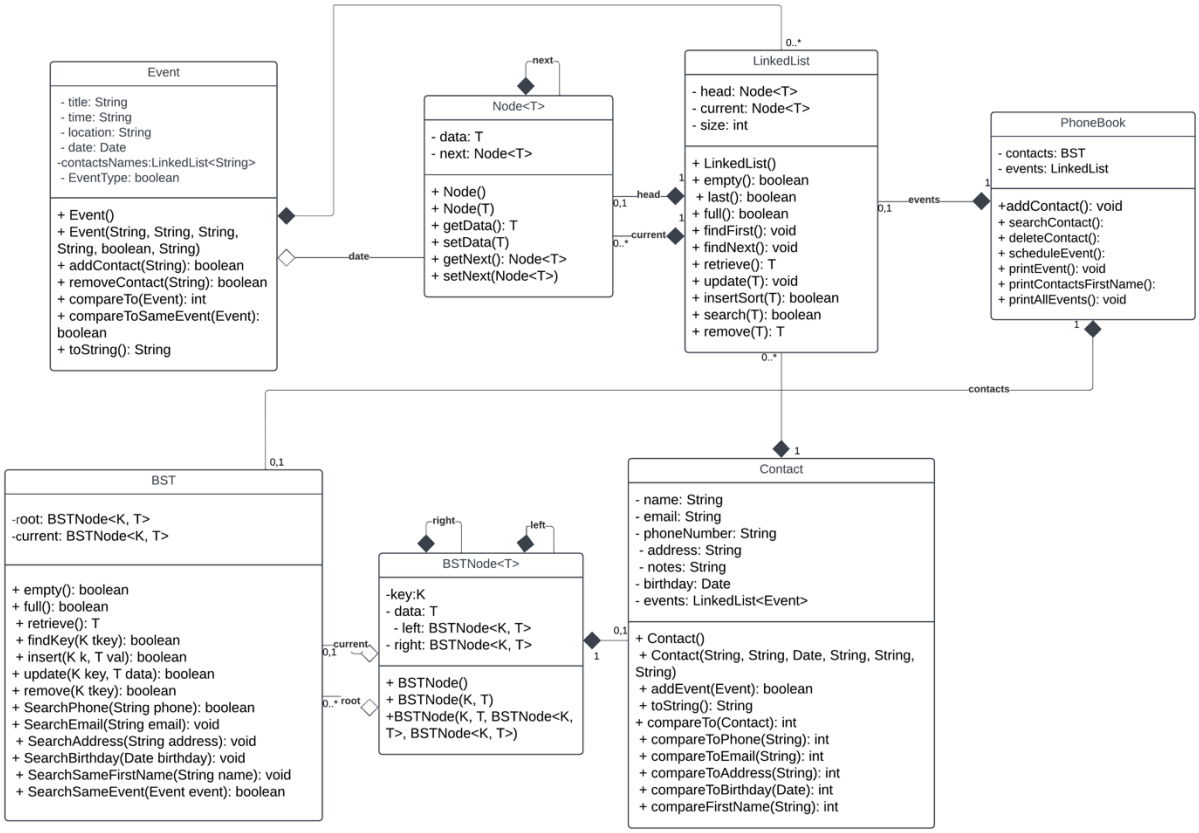
- **printAllEvents()**

  Input: None.

  Output: Prints all events alphabetically.

  Method Functionality: Prints all events in alphabetical order.

2.Phone Book project UML class diagram



3.time complexity calculation

Method	S/E	Freq.	Total
private static void addContact() {	0	-	0
System.out.println("\nEnter the contact's name:");//1	1	1	1
String name = input.nextLine();	1	1	1
System.out.println("\nEnter the contact's phone number:");//1	1	1	1
String phoneNumber = input.nextLine();	1	1	1
if (!contacts.empty() && contacts.findKey(name)&&contacts.SearchPhone(phoneNumber))//1	1	n	n
{	0	-	0
System.out.println("Contact found!");//1	1	1	1
return;	1	1	1
}	0	-	0
System.out.println("\nEnter the contact's email address:");//1	1	1	1
String emailAddress = input.nextLine();	1	1	1
System.out.println("\nEnter the contact's address:");//1	1	1	1
String address = input.nextLine();	1	1	1
System.out.println("\nEnter the contact's birthday:");//1	1	1	1
String birthday = input.nextLine();	1	1	1
Date birthdayDate = new Date(birthday);	1	1	1
System.out.println("\nEnter any notes for the contact:");//1	1	1	1
String notes = input.nextLine();	1	1	1
Contact c = new Contact(name, emailAddress, birthdayDate, phoneNumber, address, notes); //create a new contact	1 1	1 1	1 1
if (contacts.insert(name,c))// insert the new contact	1	n	n
System.out.println("Contact added successfully!");	1	1	1
}	0	-	0
			2n
Big o()			O(n)

Method	S/E	Freq.	Total
public static void searchContact(){	1	1	1
System.out.println("Enter search criteria:");//1	1	1	1
System.out.println("1.Name");//1	1	1	1
System.out.println("2.Phone Number");//1	1	1	1
System.out.println("3.Email Address");//1	1	1	1
System.out.println("4.Address");//1	1	1	1
System.out.println("5.Birthday");//1	1	1	1
System.out.println("\nEnter your choice: ");	1	1	1
int choice2 = input.nextInt();	1	1	1
	0	-	0
if (!contacts.empty()) {//1	1	1	1
switch(choice2)	1	1	1
{	0	-	0
case 1 : {	1	1	1
	0	-	0
System.out.print("Enter the contact's name: ");	1	1	1
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");	1	1	1
String name = input.nextLine();	1	1	1
	0	-	0
if (!contacts.empty() && contacts.findKey(name))	1	n	n
{	0	-	0
System.out.println("Contact found!");	1	1	1
	0	-	0
System.out.println(contacts.retrieve().toString());	1	1	1
break;	1	1	1
}	0	-	0
System.out.println("Contact not found!");	1	1	1
	0	-	0
break;	1	1	1
}	0	-	0
	0	-	0
case 2 : {	1	1	1
System.out.print("Enter the contact's phone number:");	1	1	1
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");	1	1	1
String phonenumber = input.nextLine();	1	1	1
	0	-	0
if (!contacts.empty() && contacts.SearchPhone(phonenumber))	1	n	n
{	0	-	0
System.out.println("Contact found!");	1	1	1
	0	-	0
System.out.println(contacts.retrieve());	1	1	1
break;	1	1	1
}	0	-	0
System.out.println("Contact not found!");	1	1	1
}	0	-	0
break;	1	1	1
	0		0
case 3 : {	1	1	1
System.out.print("Enter the contact's email address: ");	1	1	1
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");	1	1	1
String emailaddress = input.nextLine();	1	1	1
	0		0
if (!contacts.empty())	1	1	1
{	0	-	0
contacts.SearchEmail(emailaddress);	1	1	1
System.out.println(contacts.retrieve());	1	1	1

System.out.println("Contact found!");
break;
}
System.out.println("Contact not found!");
}
break;
 	
case 4 : {
System.out.print("Enter the contact's address: ");
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");
String address = input.nextLine();
 	
if (!contacts.empty())
{
contacts.SearchAddress(address);
System.out.println("Contact found!");
break;
}
System.out.println("Contact not found!");
}
break;
 	
case 5 : {
System.out.print("Enter the contact's Birthday:");
 	
Date birthday = new Date(input.next());
 	
if (!contacts.empty())
{
contacts.SearchBirthday(birthday);
System.out.println("Contact found!");
break;
}
System.out.println("Contact not found!");
}
break;
}
}
else
System.out.println("Contact not found!");
 	
}
	1
	1
	0
	1
	0
	1
	0
	1
	1
	1
	1
	0
	1
	0
	1
	1
	1
	0
	1
	0
	1
	0
	1
	0
	1
	0
	1
	0
	1
	0
	1
	0
	0
	1
	1
	0
	0
		1
		1
		-
		1
		-
		1
		
		1
		1
		1
		1
		
		1
		-
		1
		1
		1
		-
		1
		-
		1
		
		1
		1
		
		1
		
		1
		-
		1
		1
		1
		-
		1
		-
		1
		1
		
		-
		-
		1
		1
		
		-
			1
			1
			0
			1
			0
			1
			0
			1
			1
			1
			1
			0
			1
			0
			1
			1
			1
			0
			1
			0
			1
			0
			1
			0
			1
			0
			1
			0
			1
			0
			1
			0
			0
			1
			1
			0
			0

			2n
Big o()			O(n)

Method	S/E	Freq.	Total
public static void deleteContact(){	0	-	0
System.out.print("Enter the contact's name: ");	1	1	1
//input.skip("\r\n|[\n\r\u2028\u2029\u0085]");	0	1	0
String name= input.nextLine();	1		1
Contact c = new Contact();// create new contact	1	1	1
c.name = name;// set new caontact name	1	1	1
	0		0
if (! contacts.empty())	1	n	n
{	1		1
if (!contacts.findKey(c.name)){	0	-	0
System.out.println("Contact not found!");	1	1	1
return;	1	1	1
}	1	-	1
c = contacts.retrieve();	0	1	0
contacts.remove(c.name);	1	1	1
if (! c.events.empty())	1		1
{	1	1	1
c.events.findFirst();	0		0
for (int i = 0 ; i < c.events.size ; i++)	1	n + 1	n+1
{	1		1
Event e = c.events.retrieve();	0	n	n
if ((!events.empty()) && events.search(e)){	1	n(n)	n(n)
	0		0
if((events.retrieve().date.compareTo(e.date)== 0) &&	1	n(n)	n(n)
(events.retrieve().time.compareTo(e.time)==0)	1		1
&& (events.retrieve().location.compareTo(e.location)==0) &&	1		1
(events.retrieve().EventType== e.EventType))	1		1
{	0		0
Event updateEvent = events.retrieve();// the event that was found with the same information	1	n	n
	0		0
updateEvent.removeContact(c.name);// remove contact from event	1	n	n
if (updateEvent.contactsNames.empty())	1	n	n
{	0		0
events.remove(e);// remove event	1	n(n)	n(n)
System.out.println("Event is deleted ");	1	n	n
}	0		0
else	1		1
events.update(updateEvent);	1	n	n
}}	0		0
c.events.findNext();	1	n	n
}	0		0
}	0		0
System.out.println("Contact Deleted Successfully!");	1	1	1
System.out.println(c);	1	1	1
}else	1		1
System.out.println("Contact not found!");	1	1	1
}	0		0
			2n^2 +8n+1
Big o()			O(n^2)

Method	S/E	Freq.	Total
public static void scheduleEvent(){	0	-	0
System.out.println("Enter type:");	1	1	1
System.out.println("1. event");	1	1	1
System.out.println("2. appointment");	1	1	1
System.out.println("\nEnter your choice: ");	1	1	1
int choice4 = input.nextInt();	1	1	1
String typeChoice;	1	1	1
Contact c = new Contact();	1	1	1
Event e = new Event();	1	1	1
switch(choice4){	1	1	1
case 1:{	1	1	1
boolean updatedEvent = false	1	1	1
typeChoice = "Event";	1	1	1
System.out.print("Enter event title: ");	1	1	1
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");	1	1	1
String Title = input.nextLine();	1	1	1
e.title= Title;	1	1	1
System.out.print("Enter contacts name separated by comma: ");	1	1	1
String name = (input.nextLine());	1	1	1
String [] names = name.split(",");	1	1	1
if (!contacts.empty()) {	1	1	1
System.out.print("Enter event date and time (MM/DD/YYYY HH:MM): ");	1	1	1
String eDate = input.next();	1	1	1
String eTime = input.next();	1	1	1
e.date = new Date(eDate);	1	1	1
e.time = eTime;	1	1	1
System.out.print("Enter event location: ");	1	1	1
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");	1	1	1
	1	1	1
String loc = input.nextLine();	1	1	1
	1	1	1
e.location = loc;	1	1	1
	1	1	1
c = contacts.retrieve();	1	1	1
	1	1	1
for(int i =0 ; i<names.length;i++){	1	n+1	1
		1	
c.name = names[i].trim();	1	1	1
	1	1	1
if(!contacts.empty() && contacts.findKey(c.name)) {	1	1	1
	1	1	1
c = contacts.retrieve();	1		1
		1	
if (c.addEvent(e)) {	1		1
		n	
contacts.update(c.name,c);	1		1
		1	
if ((!events.empty()) && events.search(e) && (events.retrieve().date.compareTo(e.date)==0) && (events.retrieve().time.compareTo(e.time)==0)&&(events.retrieve().location.compareTo(e.location)==0) && (events.retrieve().EventType== e.EventType)) {		1	
	1	1	1
Event eventFound = events.retrieve();	1	1	1
	1	1	1
eventFound.contactsNames.insertSort(c.name);	1	1	1
events.update(eventFound);	1	1	1
updatedEvent = true }	1	1	1
if (!updatedEvent) {	1	1	1
e.contactsNames.insertSort(c.name);	1		1
events.insertSort(e); }	1		1
System.out.println("Event scheduled successfully! " + c.name); }	1		1

else
System.out.println("You have a conflict Event "+ c.name);
} else
System.out.println("contact not found " + c.name) }}
}break;
case 2:
typeChoice = "Appoinment";
e.EventType = false;
System.out.print("Enter appoinment title: ");
input.nextLine();
e.title = input.nextLine();
System.out.print("Enter contact name: ");
c.name = input.nextLine();
if (! contacts.empty() && contacts.findKey(c.name) == true) {
c = contacts.retrieve();
System.out.print("Enter appoinment date and time (MM/DD/YYYY HH:MM): ");
e.date = new Date (input.next())
e.time = input.next();
System.out.print("Enter appoinment location: ");
input.nextLine();
e.location = input.nextLine();
if ((!events.empty()) && events.search(e) && (events.retrieve().date.compareTo(e.date)==0)&& (events.retrieve().time.compareTo(e.time)==0) && (events.retrieve().location.compareTo(e.location)==0 && (events.retrieve().EventType== e.EventType)) {
System.out.println("Appointment had been scheduled previously, could not add more contacts, try again "); }
Else
if (c.addEvent(e) {
contacts.update(c.name,c);
e.contactsNames.insertSort(c.name);
events.insertSort(e);
System.out.println("The Appoinment is scheduled successfully! "); }
else
System.out.println("there is a conflict Event/Appoinment ! "); } }
else
System.out.println("Cantcat not found !"); } }
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		n
		1
		1
		1
		1
		1
		1
		n
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
		1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			n
			1
			1
			1
			1
			1
			1
			n
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1
			1

			4n
Big o()			O(n)

Method	S/E	Freq.	Total
public static void printEvent(){	0	-	-
System.out.println("Enter search criteria:");	1	1	1
System.out.println("1.contact name");	1	1	1
System.out.println("2.Event title");	1	1	1
System.out.println("\nEnter your choice: ");	1	1	1
int choice3 = input.nextInt()	1	1	1
if(!events.empty()){	1	1	1
switch (choice3) {	1	1	1
case 1 {	1	1	1
Contact c = new Contact();	1	1	1
System.out.print("Enter the contact name:");	1	1	1
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");	1	1	1
c.name = (input.nextLine())	1	1	1
if (!contacts.empty() {	1	n	n
if (contacts.findKey(c.name) == true) {	1	1	1
System.out.println("Contact found!");	1	1	1
c = contacts.retrieve();	1	1	1
c.events.findFirst();	1	n+1	n+1
for (int i = 0 ; i < c.events.size ; i++) {	1	1	1
Event e = c.events.retrieve();	1	1	1
if (!events.empty() && events.search(e))	1	1	1
System.out.println(events.retrieve());	1	n	n
c.events.findNext(); }	1	1	1
if (c.events.empty())	1	1	1
System.out.println("There is no events for this contact"); }	1	1	1
else	1	1	1
System.out.println("Contact not found!"); }	1	1	1
else	1	1	1

System.out.println("Contact not found!");
} break
case 2 {
Event e = new Event();
System.out.print("Enter the event title:");
input.skip("\r\n|[\n\r\u2028\u2029\u0085]");
e.title = input.nextLine();
if (!events.empty()&&events.search(e)) {
System.out.println("Event found!");
System.out.println(events.retrieve()); }
else
System.out.println("Event not found!") }
break; }
}else
System.out.println("There are no events."); }
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
	1
		1
		1
		1
		1
		1
		1
		1
		n
		1
		1
		1
		1
		1
		1
		1
		1
		1
			1
			1
			1
			1
			1
			1
			1
			n
			1
			1
			1
			1
			1
			1
			1
			1
			1

			3n
Big o()			O(n)

Method	S/E	Freq.	Total
public static void printContactsFirstName(){	0	-	-
System.out.print("Enter the first name:");	1	1	1
String fname = input.nextLine();	1	1	1
if (contacts.empty())	1	1	1
System.out.println("There is no Contacts found");	1	1	1
else	1	1	1
contacts.SearchSameFirstName(fname);	1	1	1
}	0	-	-
			6
Big o()			O(1)

Method	S/E	Freq.	Total

public static void printAllEvents(){
if(!events.empty())
System.out.println(events.toString());
else
System.out.println("no events found!"); }
}
	0
	1
	1
	1
	1
	0
		-
		1
		n
		1
		1
		-
			-
			1
			1
			1
			1
			-

			n+4
Big o()			O(n)