1. Insert Contact

Start

If (phonebook has space) Then
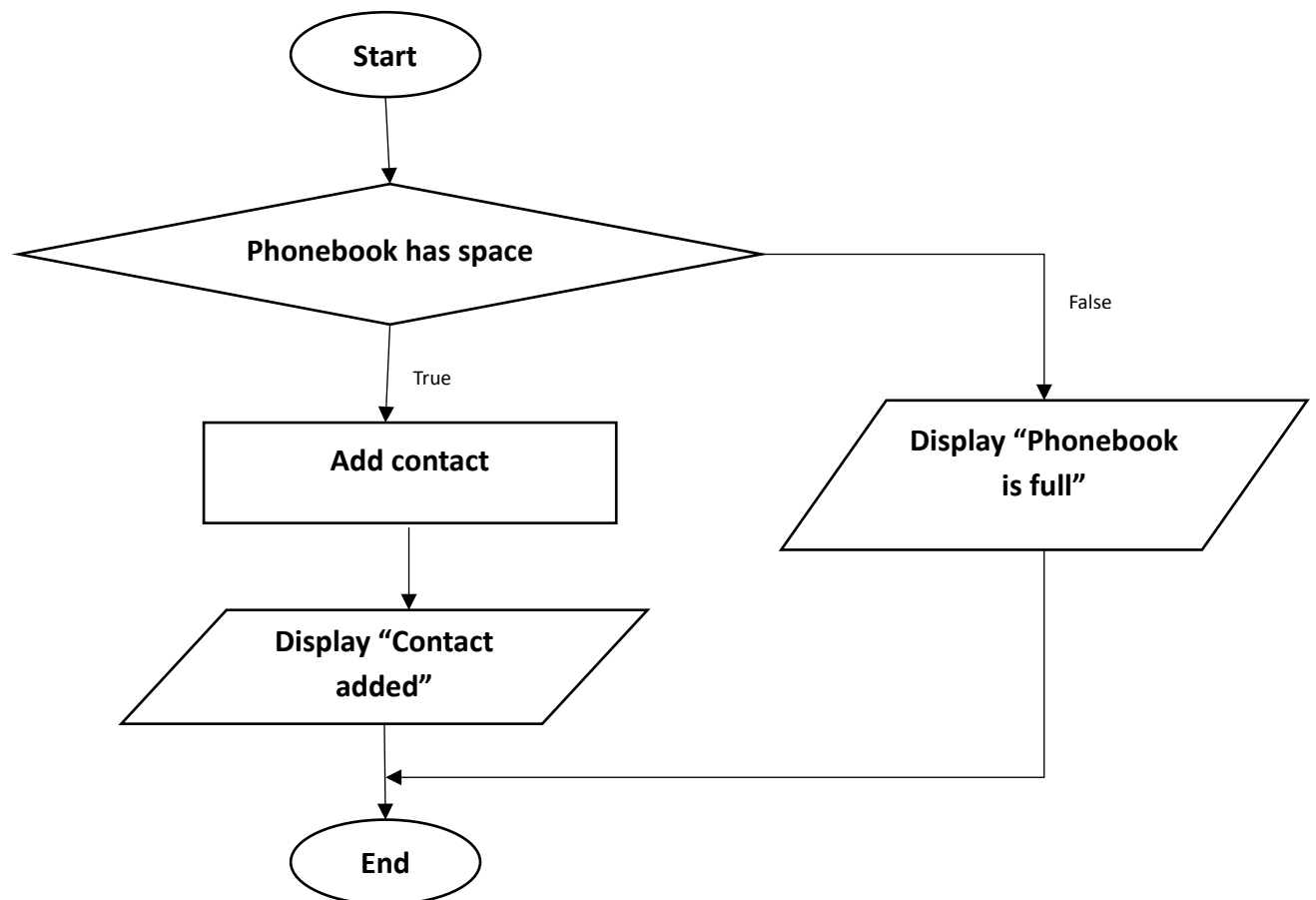
   Add contact

   Display "Contact added"

Else

   Display "Phonebook is full"

End

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
                         ▼
                    ◇ Phonebook has space ◇
                    │                    │
                 True│               False│
                    ▼                    ▼
            ┌──────────────┐      ╱ Display "Phonebook ╱
            │ Add contact  │     ╱      is full"      ╱
            └──────────────┘
                    │
                    ▼
            ╱ Display "Contact ╱
           ╱      added"      ╱
                    │
                    ▼
               ┌─────────┐
               │   End   │
               └─────────┘
```

2. Search Contact

Start

For each contact in phonebook

  If (name matches) Then
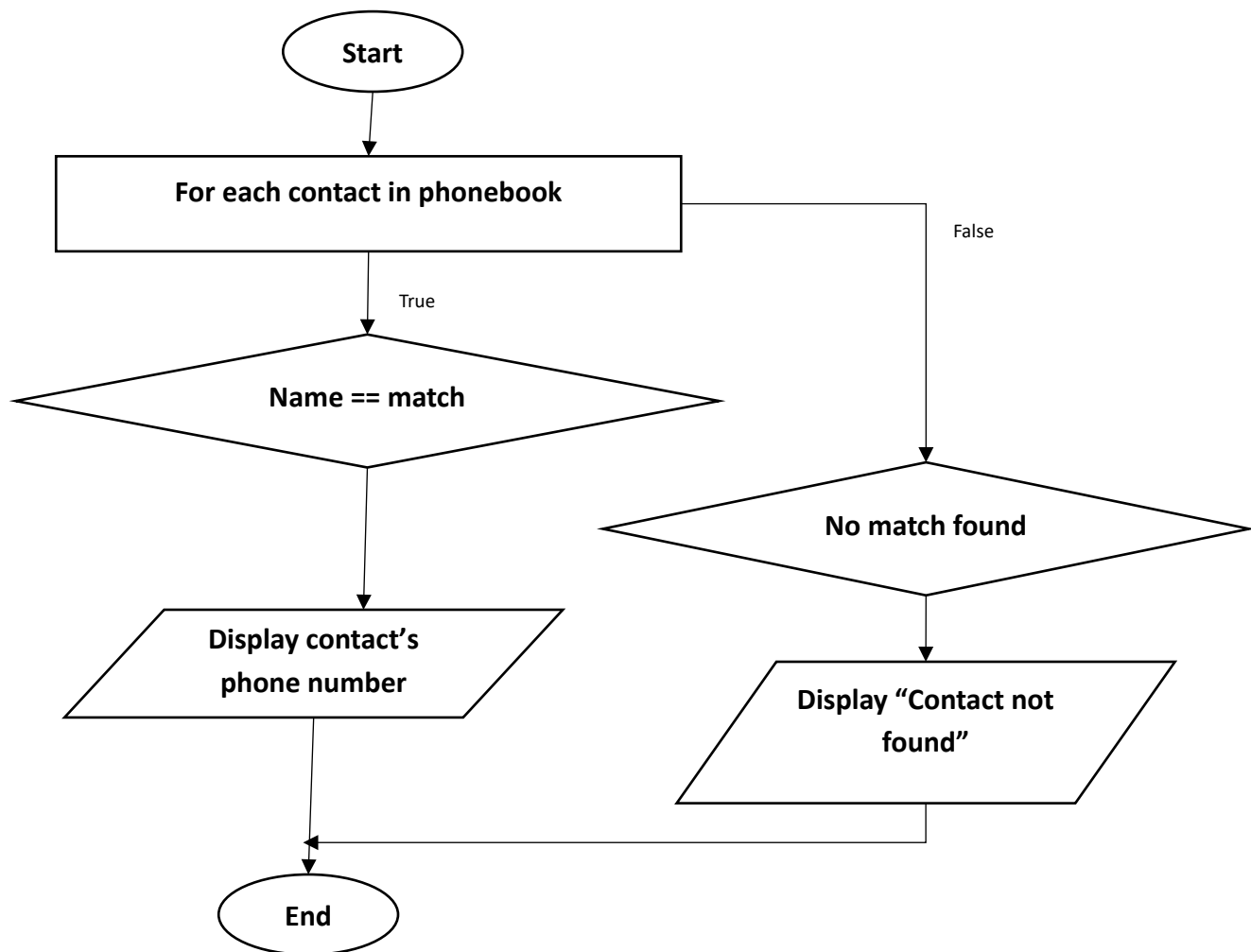
    Display contact's phone number

    Else

If (no match found) Then

  Display "Contact not found"

End

```
                          ┌───────────┐
                          │   Start   │
                          └─────┬─────┘
                                │
        ┌───────────────────────▼───────────────────────┐
        │        For each contact in phonebook           │──────────┐
        └───────────────────────┬───────────────────────┘     False │
                                │ True                               │
                          ◇ Name == match ◇                          │
                                │                             ◇ No match found ◇
                                │                                    │
                    ▱ Display contact's              ▱ Display "Contact not
                      phone number ▱                        found" ▱
                                │                                    │
                          ┌─────▼─────┐◄────────────────────────────┘
                          │    End    │
                          └───────────┘
```

3. Display All Contacts

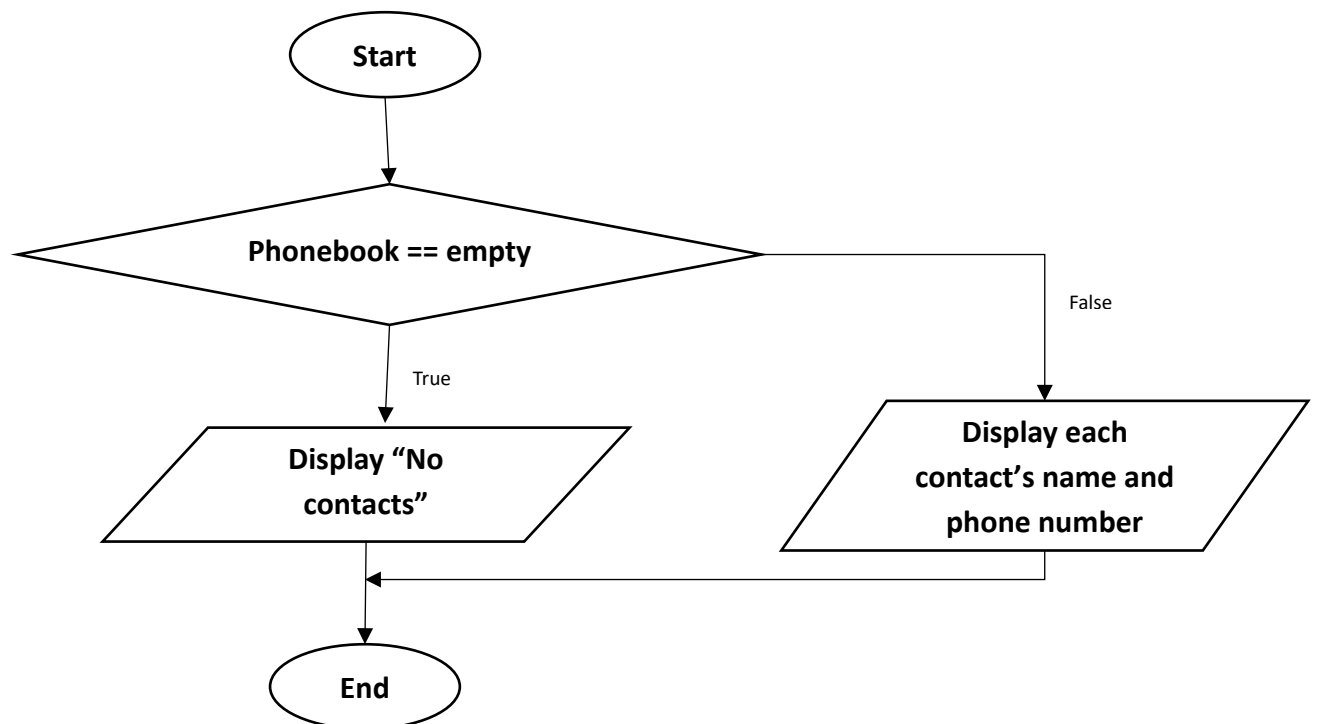Start

If (phonebook is empty) Then

   Display "No contacts"

Else

   Display each contact's name and phone number

End

```
                    ┌─────────┐
                    │  Start  │
                    └─────────┘
                         │
                         ▼
              ◇ Phonebook == empty ◇ ─────────► False
                         │                         │
                       True                        ▼
                         │              ┌────────────────────┐
                         ▼              │   Display each     │
              ┌────────────────┐        │ contact's name and │
              │  Display "No   │        │   phone number     │
              │   contacts"    │        └────────────────────┘
              └────────────────┘
                         │
                         ▼
                    ┌─────────┐
                    │   End   │
                    └─────────┘
```

4. Delete Contact

Start

For each contact in phonebook

  If (name matches) Then

    Delete contact

    Display "Contact deleted"

    Else

If (no match found) Then

  Display "Contact not found"

End

```
              ┌─────────┐
              │  Start  │
              └─────────┘
                   │
        ┌──────────────────────────────┐
        │  For each contact in phonebook│──────────┐ False
        └──────────────────────────────┘          │
                   │ True                          │
              ◇ name == matches ◇            ◇ No matches found ◇
                   │                               │
            ┌──────────────┐              ╱ Display "Contact not found" ╱
            │ Delete contact│
            └──────────────┘
                   │
         ╱ Display "Contact deleted" ╱
                   │
              ┌─────────┐
              │   End   │
              └─────────┘
```

Start

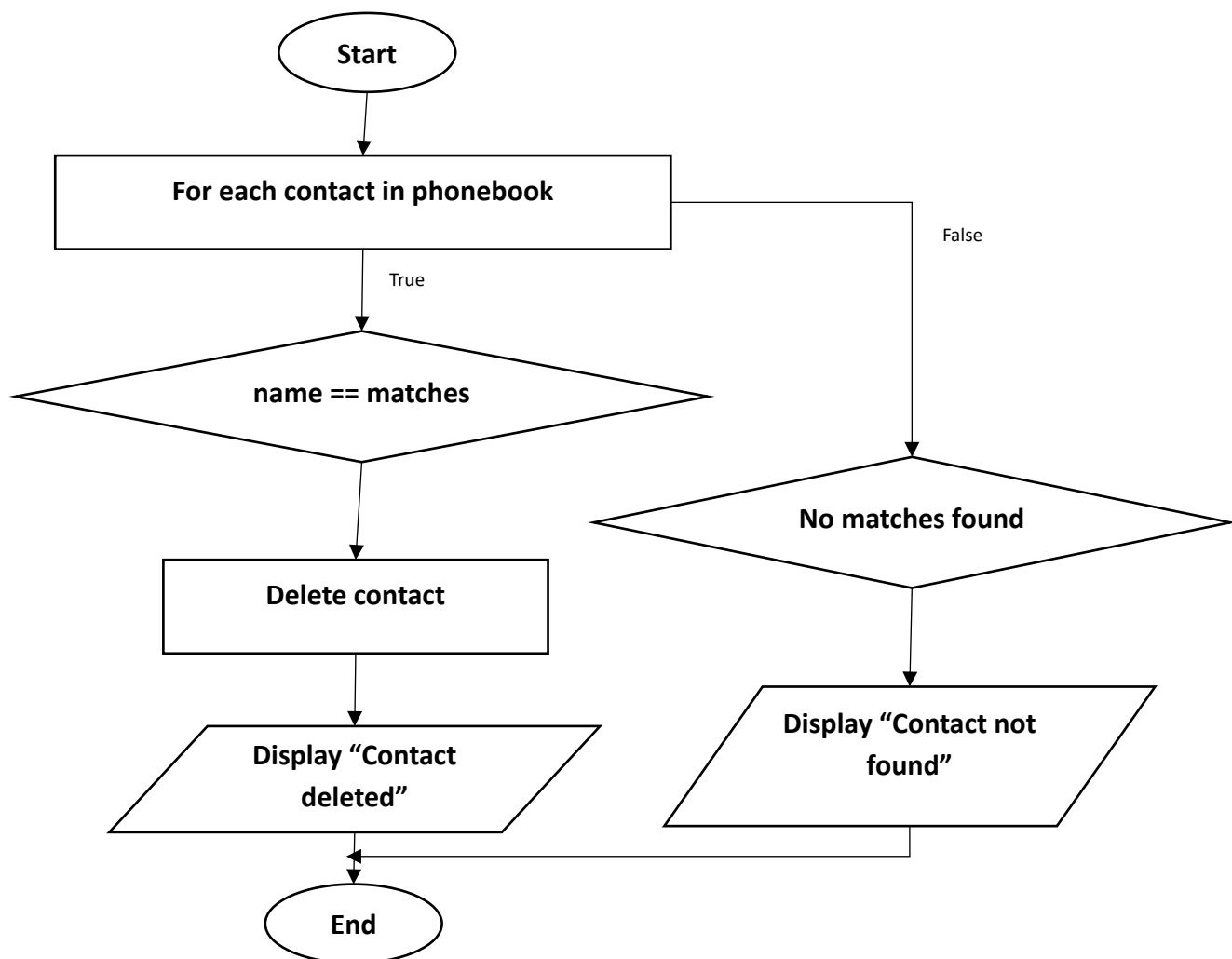For each contact in phonebook

True

False

name == matches

No matches found

Delete contact

Display "Contact deleted"

Display "Contact not found"

End

5. Update Contact

Start

For each contact in phonebook
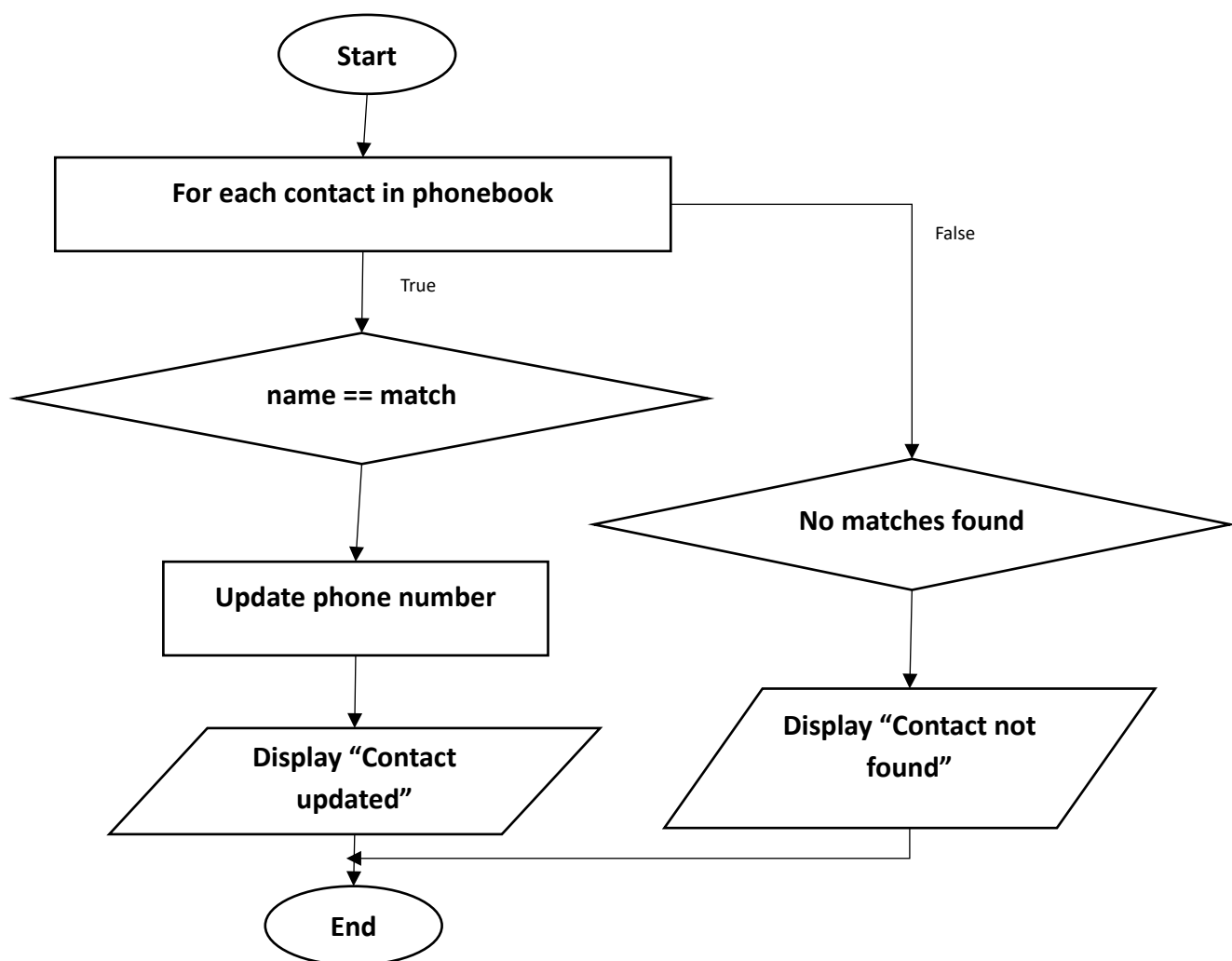
  If (name matches) Then

    Update phone number

    Display "Contact updated"

    Else

If (no match found) Then

  Display "Contact not found"

End

```
                          ┌─────────┐
                          │  Start  │
                          └─────────┘
                               │
                               ▼
      ┌──────────────────────────────────────────────┐
      │        For each contact in phonebook          │────────────┐ False
      └──────────────────────────────────────────────┘            │
                               │ True                              │
                               ▼                                   ▼
                      ╱─────────────────╲                 ╱─────────────────╲
                      ╲  name == match  ╱                 ╲ No matches found ╱
                       ╲───────────────╱                   ╲───────────────╱
                               │                                   │
                               ▼                                   ▼
                      ┌─────────────────┐                 ╱───────────────────╱
                      │ Update phone    │                ╱  Display "Contact  ╱
                      │ number          │               ╱     not found"     ╱
                      └─────────────────┘              ╱───────────────────╱
                               │                                   │
                               ▼                                   │
                     ╱───────────────────╱                         │
                    ╱  Display "Contact  ╱                         │
                   ╱     updated"        ╱                          │
                  ╱───────────────────╱                            │
                               │◄──────────────────────────────────┘
                               ▼
                          ┌─────────┐
                          │   End   │
                          └─────────┘
```

6. Sort Contacts

Start

If (phonebook is not empty) Then

   Sort contacts alphabetically

   Display "Contacts sorted"

Else

   Display "Phonebook is empty"

End

```
                    ┌──────────┐
                    │  Start   │
                    └────┬─────┘
                         │
                         ▼
              ◇ Phonebook != empty ◇──────────────► False
                         │                            │
                        True                          ▼
                         │              ┌───────────────────────┐
                         ▼              │  Display "Phonebook    │
          ┌───────────────────────┐    │      is empty"         │
          │ Sort contacts         │    └───────────┬───────────┘
          │ alphabetically        │                │
          └───────────┬───────────┘                │
                      │                             │
                      ▼                             │
          ┌───────────────────────┐                │
          │  Display "Contact      │               │
          │     sorted"            │               │
          └───────────┬───────────┘                │
                      │◄───────────────────────────┘
                      ▼
                 ┌──────────┐
                 │   End    │
                 └──────────┘
```
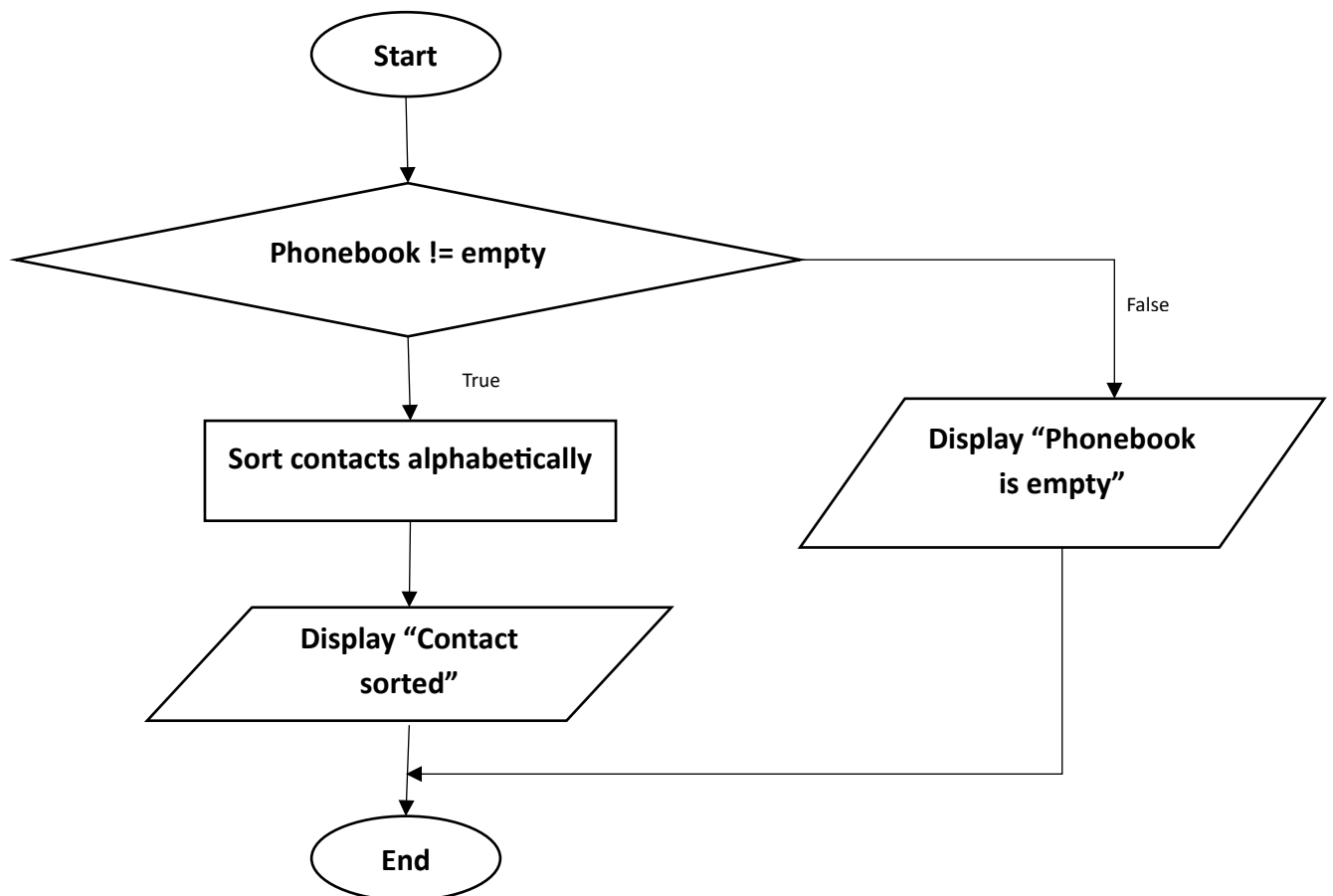
7. Analyse Search Efficiency

Start

Count total contacts in phonebook

Display "Search time depends on number of contacts"

End

```
              ┌─────────────┐
              │    Start    │
              └──────┬──────┘
                     │
                     ▼
   ┌─────────────────────────────────────┐
   │  Count total contacts in phonebook  │
   └─────────────────┬───────────────────┘
                     │
                     ▼
        ╱───────────────────────╲
       ╱   Display" Search time   ╲
      ╱    depends on number of    ╲
      ╲       contacts"            ╱
       ╲─────────────────────────╱
                     │
                     ▼
              ┌─────────────┐
              │     End     │
              └─────────────┘
```