Phonebook Application Pseudocode

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CLASS Contact

    FUNCTION __init__(name, phone, email)

        SET self.name = name

        SET self.phone = phone

        SET self.email = email

END CLASS


CLASS Phonebook

    INITIALIZE contacts AS LIST


    FUNCTION __init__()

        SET contacts = NEW ArrayList()

    END FUNCTION


    // 1. Insert Contact

    FUNCTION insert_contact(name, phone, email)

        CREATE newContact AS Contact(name, phone, email)

        APPEND newContact TO contacts

    END FUNCTION


    // 2. Search Contact

    FUNCTION search_contact(name)

        FOR EACH contact IN contacts

            IF contact.name EQUALS name THEN

                RETURN contact
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        END IF

    END FOR

    RETURN NULL // Not found

END FUNCTION


// 3. Display All Contacts

FUNCTION display_contacts()

    FOR EACH contact IN contacts

        PRINT "Name: " + contact.name + ", Phone: " + contact.phone + ", Email: " +
contact.email

    END FOR

END FUNCTION


// 4. Delete Contact

FUNCTION delete_contact(name)

    FOR i FROM 0 TO LENGTH(contacts) - 1

        IF contacts[i].name EQUALS name THEN

            REMOVE contacts[i] AT INDEX i

            RETURN TRUE // Successfully deleted

        END IF

    END FOR

    RETURN FALSE // Not found

END FUNCTION


// 5. Update Contact

FUNCTION update_contact(name, new_phone, new_email)

    SET contact = search_contact(name)

    IF contact IS NOT NULL THEN
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            SET contact.phone = new_phone

            SET contact.email = new_email

            RETURN TRUE // Successfully updated

        END IF

        RETURN FALSE // Not found

    END FUNCTION


    // 6. Sort Contacts

    FUNCTION sort_contacts()

        SORT contacts BY contact.name

    END FUNCTION


    // 7. Analyze Search Efficiency

    FUNCTION analyze_search_efficiency()

        RETURN "The search algorithm is a linear search with time complexity O(n). " +

            "Best Case: O(1). Worst Case: O(n)."

    END FUNCTION

END CLASS
```