22355

1)

package Q6;

class Node<T>

{

T data;

Node<T> next;

Node(T data)

{

this.data = data;

this.next = null;

}

}

public class LinkedList<T>

{

private Node<T> head;

private int size;

public LinkedList()

{

this.head = null;

this.size = 0;

}

public void addFirst(T data)

{

Node<T> newNode = new Node<>(data);

newNode.next = head;

head = newNode;

size++;

}

public void addLast(T data) {

Node<T> newNode = new Node<>(data);

if (head == null) {

head = newNode;

} else {

Node<T> temp = head;

while (temp.next != null) {

temp = temp.next;

}

temp.next = newNode;

}

size++;

}

public void removeFirst()

{

if (head != null) {

head = head.next;

size--;

}

}

public void removeLast()

{

if (head == null) return;

if (head.next == null) {

head = null;

} else {

Node<T> temp = head;

while (temp.next.next != null) {

temp = temp.next;

}

temp.next = null;

}

size--;

}

public void printList()

{

Node<T> temp = head;

while (temp != null) {

System.out.print(temp.data + " -> ");

temp = temp.next;

}

System.out.println("null");

}

public int getSize() {

return size;

}

public boolean search(T key) {

Node<T> temp = head;

while (temp != null) {

if (temp.data.equals(key)) return true;

temp = temp.next;

}

return false;

}

public static void main(String[] args)

{

LinkedList<Integer> list = new LinkedList<>();

list.addFirst(10);

list.addFirst(20);

list.addLast(30);

list.addLast(40);

list.printList();

list.removeFirst();

list.printList();

list.removeLast();

list.printList();

System.out.println("Size: " + list.getSize());

System.out.println("Search 10: " + list.search(10));

System.out.println("Search 50: " + list.search(50));

}

}

2)

package Q6;

class Book

{

String title, author;

boolean isavl;

Book(String title, String author) {

this.title = title;

this.author = author;

this.isavl = true;

}

void borrowBook() {

if (isavl) {

isavl = false;

}

}

void returnBook() {

isavl = true;

}

}

class RegularBook extends Book {

RegularBook(String title, String author) {

super(title, author);

}

}

class ReferenceBook extends Book {

ReferenceBook(String title, String author) {

super(title, author);

}

@Override

void borrowBook() {

System.out.println("Reference books cannot be borrowed.");

}

}

class Library {

private List<Book> books = new ArrayList<>();

void addBook(Book book) {

books.add(book);

}

void displayBooks() {

for (Book book : books) {

System.out.println(book.title + " by " + book.author + " - " + (book.isavl ? "Available" : "Borrowed"));

}

}

}

class User {

void borrowBook(Book book) {

book.borrowBook();

}

void returnBook(Book book) {

book.returnBook();

}

}

public class Main {

public static void main(String[] args) {

Library library = new Library();

library.addBook(new RegularBook("Java Basics", "John Doe"));

library.addBook(new ReferenceBook("Advanced Java", "Jane Doe"));

library.displayBooks();

User user = new User();

user.borrowBook(library.books.get(0));

library.displayBooks();

}

}

3)

package Q6;

import java.util.Scanner;

class ATM {

private int pin = 1234;

private double balance = 1000.0;

boolean authenticate(int inputPin) {

return inputPin == pin;

}

void withdraw(double amount) {

if (amount > 0 && amount <= balance) {

balance -= amount;

}

}

void deposit(double amount) {

if (amount > 0) {

balance += amount;

}

}

}

public class Main1 {

public static void main(String[] args)

{

Scanner scanner = new Scanner(System.in);

ATM atm = new ATM();

System.out.print("Enter PIN: ");

int inputPin = scanner.nextInt();

if (atm.authenticate(inputPin)) {

atm.withdraw(200);

atm.deposit(500);

}

}}