import java.util.Scanner;

public class ArrayList {

private Object[] data;

private int size;

public ArrayList() {

data = new Object[10];

size = 0;

}

public ArrayList(int initialCapacity) {

data = new Object[initialCapacity];

size = 0;

}

public void add(Object element) {

if (size == data.length) {

ensureCapacity();

}

data[size] = element;

size++;

}

public void add(int index, Object element) {

if (index < 0 || index > size) {

System.out.println("无效位置/超出范围");

return;

}

if (size == data.length) {

ensureCapacity();

}

for (int i = size; i > index; i--) {

data[i] = data[i - 1];

}

data[index] = element;

size++;

}

public Object get(int index) {

if (index < 0 || index >= size) {

System.out.println("无效位置/超出范围");

return null;

}

return data[index];

}

public void remove(int index) {

if (index < 0 || index >= size) {

System.out.println("无效位置/超出范围");

return;

}

for (int i = index; i < size - 1; i++) {

data[i] = data[i + 1];

}

data[size - 1] = null;

size--;

}

public void set(int index, Object element) {

if (index < 0 || index >= size) {

System.out.println("无效位置/超出范围");

return;

}

data[index] = element;

}

public int size() {

return size;

}

public void PrintList(){

System.out.println("List: ");

for (int i = 0; i < size; i++){

System.out.print(data[i] + " ");

}

System.out.println("");

System.out.println("");

}

private void ensureCapacity() {

int newCapacity = data.length \* 2;

Object[] newData = new Object[newCapacity];

System.arraycopy(data, 0, newData, 0, size);

data = newData;

}

public static void PrintMenu(){

System.out.println("1. 在列表最后位置添加数据（输入格式：1 数据）");

System.out.println("2. 在第i个位置上添加数据（输入格式：2 位置 数据）");

System.out.println("3. 获取第i个位置上的数据（输入格式：3 位置）");

System.out.println("4. 删除第i个位置上的数据（输入格式：4 位置）");

System.out.println("5. 修改第i个位置上的数据（输入格式：5 位置 数据）");

System.out.println("0. 退出程序");

}

public static void main(String[] args) {

ArrayList myList = new ArrayList();

Scanner reader = new Scanner(System.in);

System.out.print("请输入初始化列表的大小：");

int initialSize;

while (true){

while (!reader.hasNextInt()){

System.out.println("请输入整数！");

System.out.print("请输入初始化列表的大小：");

reader.next();

}

initialSize = reader.nextInt();

if (initialSize < 0){

System.out.println("初始化大小不能小于0！");

System.out.print("请输入初始化列表的大小：");

continue;

}

break;

}

myList = new ArrayList(initialSize);

PrintMenu();

while (reader.hasNext()){

if (!reader.hasNextInt()){

System.out.println("请输入正确的模式序号！");

reader.next();

continue;

}

int mode = reader.nextInt();

if (mode == 1){

myList.add(reader.next());

myList.PrintList();

}

else if (mode == 2){

myList.add(reader.nextInt(), reader.next());

myList.PrintList();

}

else if (mode == 3){

System.out.println(myList.get(reader.nextInt()));

}

else if (mode == 4){

myList.remove(reader.nextInt());

myList.PrintList();

}

else if (mode == 5){

myList.set(reader.nextInt(), reader.next());

myList.PrintList();

}

else if (mode == 0){

break;

}

else{

System.out.println("请输入正确的模式序号！");

continue;

}

}

reader.close();

}

}

