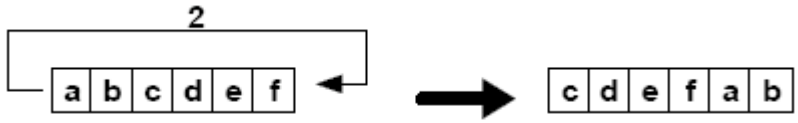
1. Consider a String of any arbitrary length. We can rotate the contents of the String two positions left by shifting the contents of the string to the left and appending to the end of the string the first



two characters shifted out of the String. See the Array example below.

Write a public static method named rotateCharArray which takes a single parameter, an array of type char and returns a new char array rotated to the left by two positions as show above. The given array of type char parameter can be of any arbitrary length >= 1. Note that the method does not alter the contents of the original array.

2. Write an Employee class that contains the first and last name of the employee and information about their yearly salary (a double). In addition to any necessary instance variables, your Employee class should include the following:
   a. A constructor that has parameters for an employee's last name, first name, and salary.
   b. Accessor and mutator methods for each of the Employee class' instance variables.
   c. A toString() method that includes the information used by the class the employee's name and salary. The exact format of the String is unspecified and for you to decide.
   d. An equals() method that compares two Employee objects and returns true if they have the same name and salary; otherwise, it returns false.

3. An anagram is a word or phrase formed by reordering the letters of another word or phrase. The isAnagram method takes two String parameters and compares them to determine if they are an anagram. Examples of anagrams are "remote" & "meteor", "Elvis" & "lives".

   Write the isAnagram method for the WordFun class. You can assume there are no spaces, punctuation, or non-alphabetic characters in either word.

4. Definitions. Listed below are a set of definitions and a set of words/phrases. Each is identified by a letter. In the box to the left of each definition, write the single letter that identifies the word/phrase that you think best matches the definition. There are fewer definitions than there are words/phrases, so not all words/phrases will be matched. A word/phrase may be used as an answer at most one time.

Enter letter of best matching word/phrase	Definition
	The name used inside a method for a value that has been passed to the method.
	A method that has just enough code to compile but not enough to do its job.
	A service provided by a class to construct of instantiate Objects belonging to that class.
	When two or more methods have the same name but different parameters, this is called _____.
	A value passed to a method when it is called.
	Use this to store a value within a method.

Answer Letters	Word/phrase (in alphabetical order)
A	Actual parameter / argument
B	Algorithm
C	Attribute
D	Class
E	Comment
F	Constructor
G	Formal parameter/ parameter
H	Instantiate
I	Method
J	Overloading
K	Overriding
L	Signature
M	Stepwise Refinement
N	Stub

5. State whether the following are true or false.
   a. A private instance variable is visible in all methods inside the declared class.
   b. The equals operator(= =) when used with Objects test whether the Object on the left side of the operator has the same attributes as the Object on the right side.
   c. A stub is a statement that is included to make a program more understandable.
   d. if and while are both examples of repetition constructs.
   e. Stepwise refinement makes it easier to debug programs.
   f. To avoid making unnecessary method calls, it is good programming practice to make instance variables public.
   g. The method public long getNumber() overloads the method public int getNumber().

6. You are given a class PhoneContact that stores a name (as a String) and a phone number (as an int); it contains accessor methods getName( ) and getNumber( ). Create a class SpeedDial to store up to 10 names and their associated phone numbers. The class must have the following methods:
   a. public int retrieve(int index)
   b. public int retrieve(String name)
   c. public void delete(int index)
   d. public void delete(String name)

7. Consider the following classes:

```
public class A {

    private int num = 0;

    public A(int num) {
      this.num = num;
    }

    public int getNum() {
      return this.num;
    }

    public void methodA(int n) {
      n = this.num;
      this.num = n;
    }
}
```

```
public class B {

    private int num = 0;

    public B(int num) {
      this.num = num;
    }

    public int getNum() {
      return this.num;
    }

    public void methodB(A other) {
      other.methodA(num);
      this.num++;
    }
}
```

Trace the following code using memory diagrams, and show the contents of memory after the code has been executed. Assume it is in a main method.

```
A a1 = new A(5);
A a2 = new A(7);
B b1 = new B(a2.getNum());
B b2 = new B(11);
a1.methodA(a2.getNum());
b1.methodB(a1);
b2 = b1;
b2.methodB(a2);
```

8. Extra array practice – write the following methods dealing with arrays:
   public static int countNumberOfEvens(int[] a)
   public static int findLargestRowSum(double[][] a)
   public static int countNumberOfDistinctElements(Object[] a)