**Object Oriented Development**

Module 2: Arrays & Lists

**This document includes the answers to the exercises**

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## **Please note:**

Be careful about looking at the solutions too quickly; make sure you’ve given yourself time to wrestle with the concepts you just learned before looking at a solution. Also, there are several ways to solve many of the exercises, and the solutions only show one possible way to complete each exercise.

# Section 1 - Arrays

## 1.1 Friends array

Create an array containing the names of your five best friends.

Now do the following with your array:

1. Display the number of friends in the array.
2. Display each name in the array on a separate line.
3. You’re no longer friends with the fifth person in the array. Replace their name with a new friend.
4. Sort the array.
5. Display the first person in the array.
6. Display the last person in the array.
7. You’re no longer friends with the second person in the array. Remove their name from the array by replacing it with null.

## 1.2 Poker Hand

Create an empty array of Strings called pokerHand with 5 elements.

Now do the following with your array.

1. Add the String “Queen of hearts” into the first position in your array.
2. Add the String “3 of spades” into the second position in your array.
3. Add the String “3 of diamonds” into the third position in your array.
4. Add the String “9 of hearts” into the fourth position in your array.
5. Add the String “6 of clubs” into the fifth position in your array.

# Section 2 – ArrayLists

## 2.1 Shopping basket

Create an ArrayList of type String and call it shoppingBasket.

Now do the following with your ArrayList:

1. Add the following 5 items into your shopping basket one by one: milk, cereals, apples, oranges, bread
2. Display the number of items in the shopping basket.
3. Display the first item in the shopping basket.
4. Display the 5th item in the shopping basket.
5. Remove bread from the shopping basket then display the number of items in the basket.
6. Remove the third item from the shopping basket. Now display the names of all items left in the basket. (should display milk, cereals & oranges)
7. Add the following 3 items into the basket: potatoes, olive oil, chicken
8. Sort the basket then display the first item and the last item. (should be cereals & potatoes)

## 2.2 Salaries

Create an ArrayList of type Integer and call it salaries.

Now do the following with your ArrayList:

1. Add the following numbers into salaries: 75000, 25000, 42000, 30000, 55000, 42000, 39000
2. Without sorting the salaries show the following information:
   1. The highest salary
   2. The lowest salary
   3. The number of people earning 42000
3. Sort the salaries and display the median salary (i.e. the one in the middle)
4. Reverse the salaries then display the first and last items.

ANSWERS

# Section 1 - Arrays

## 1.1 Friends array

Create an array containing the names your five best friends.

String[] friends = {"Tom","Pete","Paul","Chris","Tony"};

Now do the following with your array:

1. Display the number of friends in the array.

System.***out***.println(friends.length);

1. Display each name in the array on a separate line.

System.***out***.println(friends[0]);

System.***out***.println(friends[1]);

System.***out***.println(friends[2]);

System.***out***.println(friends[3]);

System.***out***.println(friends[4]);

1. You’re no longer friends with the fifth person in the array. Replace their name with a new friend.

friends[4] = "Ian";

1. Sort the array.

Arrays.*sort*(friends);

1. Display the first person in the array.

System.***out***.println(friends[0]);

1. Display the last person in the array.

System.***out***.println(friends[4]);

1. You’re no longer friends with the second person in the array. Remove their name from the array by replacing it with null.

friends[1] = **null**;

1. Display the number of friends in the array again.

System.***out***.println(friends.length);

## 1.2 Poker Hand

Create an empty array of Strings called pokerHand with 5 elements.

String[] pokerHand = **new** String[5];

Now do the following with your array.

1. Add the String “Queen of hearts” into the first position in your array.

pokerHand[0] = "Queen of hearts";

1. Add the String “3 of spades” into the second position in your array.

pokerHand[1] = "3 of spades";

1. Add the String “3 of diamonds” into the third position in your array.

pokerHand[2] = "3 of diamonds";

1. Add the String “9 of hearts” into the fourth position in your array.

pokerHand[3] = "9 of hearts";

1. Add the String “6 of clubs” into the fifth position in your array.

pokerHand[4] = "6 of clubs";

# Section 2 – ArrayLists

## 2.1 Shopping basket

Create an ArrayList of type String and call it shoppingBasket.

ArrayList<String> shoppingBasket = **new** ArrayList<String>();

Now do the following with your ArrayList:

1. Add the following 5 items into your shopping basket one by one: milk, cereals, apples, oranges, bread

shoppingBasket.add("milk");

shoppingBasket.add("cereals");

shoppingBasket.add("apples");

shoppingBasket.add("oranges");

shoppingBasket.add("bread");

Display the number of items in the shopping basket.

System.***out***.println(shoppingBasket.size());

1. Display the first item in the shopping basket.

System.***out***.println(shoppingBasket.get(0));

1. Display the 5th item in the shopping basket.

System.***out***.println(shoppingBasket.get(4));

1. Remove bread from the shopping basket then display the number of items in the basket.

shoppingBasket.remove("bread");

System.***out***.println(shoppingBasket.size());

1. Remove the third item from the shopping basket. Now display the names of all items left in the basket.

shoppingBasket.remove(2);

System.***out***.println(shoppingBasket.get(0));

System.***out***.println(shoppingBasket.get(1));

System.***out***.println(shoppingBasket.get(2));

1. Add the following 3 items into the basket: potatoes, olive oil, chicken

shoppingBasket.add("potatoes");

shoppingBasket.add("olive oil");

shoppingBasket.add("chicken");

1. Sort the basket then display the first item and the last item.

Collections.*sort*(shoppingBasket);

System.*out*.println(shoppingBasket.get(0));

System.*out*.println(shoppingBasket.get(5));

## 2.2 Salaries

Create an ArrayList of type Integer and call it salaries.

ArrayList<Integer> salaries = **new** ArrayList<Integer>();

Now do the following with your ArrayList:

1. Add the following numbers into salaries: 75000, 25000, 42000, 30000, 55000, 42000, 39000

salaries.add(75000);

salaries.add(25000);

salaries.add(42000);

salaries.add(30000);

salaries.add(55000);

salaries.add(42000);

salaries.add(39000);

1. Without sorting the salaries show the following information:
   1. The highest salary

System.***out***.println(Collections.*max*(salaries));

* 1. The lowest salary

System.***out***.println(Collections.*min*(salaries));

* 1. The number of people earning 42000

System.***out***.println(Collections.*frequency*(salaries, 42000));

1. Sort the salaries and display the median salary (i.e. the one in the middle)

Collections.*sort*(salaries);

System.***out***.println(salaries.get(3));

1. Reverse the salaries then display the first and last items.

Collections.*reverse*(salaries);

System.***out***.println(salaries.get(0));

System.***out***.println(salaries.get(6));