**Lab 5 String, Array**

**977-210 Object-Oriented Programming**

1. What is the result of the following code? Why?

String a = **"Java"**;  
String b = **"Java"**;  
String d = **new** String(**"Java"**);  
String e = **new** String(**"Java"**);  
  
System.***out***.println(a == b);  
System.***out***.println(d == e);  
System.***out***.println(a == d);  
  
String x = **"Keep calm and carry on."**;  
String y = **"You were given this life because you are strong enough to live it."**;  
  
String z = x.concat(y);  
System.***out***.println(z);  
  
System.***out***.println(z.length());  
System.***out***.println(y.substring(10));  
System.***out***.println(y.substring(3, 10));  
System.***out***.println(x.charAt(5));  
System.***out***.println(x.indexOf(**"ca"**));  
System.***out***.println(x.lastIndexOf(**'a'**));  
  
String s = **"The Hunger Games"**;  
System.***out***.println(s);  
System.***out***.println(s.replace(**'e'**, **'E'**));  
System.***out***.println(s);  
  
String p = s.replaceAll(**"The"**, **"AAA"**);  
System.***out***.println(p);  
System.***out***.println(s.toUpperCase());  
  
String q = **"Happy"**;  
System.***out***.println(q.compareTo(**"Happy"**));  
System.***out***.println(q.compareTo(**"Birthday"**));  
System.***out***.println(q.compareToIgnoreCase(**"happy"**));

1. From the following code. Which if statement is true when enter “exit” ? Scanner sc = **new** Scanner(System.***in***);  
   System.***out***.print(**"Enter a name: "**);  
   String name = sc.next();  
     
   **if** (name == **"exit"**) {  
    System.***out***.println(**"name == \"exit\") "**);  
    System.*exit*(0);  
   }  
   **if** (name.equals(**"exit"**)) {  
    System.***out***.println(**"name.equals(\"exit\")"**);  
    System.*exit*(0);  
   }  
     
   System.***out***.println(**"Bye"**);
2. From the methods for converting string to array of character and using Java API, write Java program to call the methods and show the result?

**public static void** convertStrintToArray(){  
 String str = **"You never know how strong you are, until being strong is your only choice."**;  
 **char** [] ca = str.toCharArray();  
 System.***out***.println(ca);  
 System.***out***.println(ca[4]);  
  
 **for** (**int** i=20; i<ca.**length**; i++){  
 System.***out***.print(ca[i]);  
 }  
}  
**public static void** callArraysApi(){  
 **double** d[] = {5.3, 1.65, 3.56, 0.5, 1.65, 7.8};  
 **for**(**int** i =0; i < d.**length** ; i ++){  
 System.***out***.print( d[i] + **" "**);  
 }  
 System.***out***.println();  
  
 System.***out***.println(**"Sorting"**);  
 ……………………………………………; //sort d  
 **for**(**int** i =0; i < d.**length** ; i ++){  
 System.***out***.print( d[i] + **" "**);  
 }  
 System.***out***.println();  
  
 System.***out***.println(**"Searching 1.65"**);  
 **int** pos = ……………………………….//search 1.65 in d

System.***out***.println(**"Search Key=1.65 Founded at index="** + pos);  
  
 System.***out***.println(**"Filling 1.0 to the array d"**);  
 ………………………………………//fill 1.0 to d  
 **for**(**int** i =0; i < d.**length** ; i ++){  
 System.***out***.print( d[i] + **" "**);  
 }  
 System.***out***.println();  
}

1. Lottery game:
   * Declare a 2-dimension array for the lottery numbers and assign the random numbers between 1-100 to the elements in the array.

1st row: 1 number (for the first prize = 1000$)

2nd row: 3 numbers (for the second prize = 500$)

3rd row: 5 numbers (for the third prize = 200$)

4st row: 10 numbers (for the fourth prize = 50$)

* + Get a number between 1-100 from the keyboard
  + Check the number is in the array or not. If the number matches the value in the array, show the row and column and the prize on the screen. User will get only 1 maximum prize.
  + If the number is not in the array, print “You are not lucky today.”
  + Print the array on the screen.
  + Insert the loop for playing game until user enter 999 to exit.

Enter a number for lottery game: ***74***

Congratulations: you got 2nd prize: 500$

Found at lotto[1][1]

1st prize: 8

2nd prize: 3 74 0

3rd prize: 77 88 13 41 41

4th prize: 59 56 45 20 83 31 72 43 17 78

Enter a number for lottery game: ***25***

You are not lucky today

1st prize: 41

2nd prize: 31 38 86

3rd prize: 85 28 94 96 94

4th prize: 38 61 6 90 51 53 65 38 44 56

Enter a number for lottery game: ***999***

Bye.

1. A Java Application called *TestElection* allows the user to enter the number of candidates that will participate, the candidate’s names and votes the candidate received.

* The program creates the Election object class to process vote data.
* The program will output each candidate’s name, the number of votes, and their percentage of the total votes.
* The program should output the total number of votes cast and the winner of the election.

ENTER NUMBER OF CANDIDATES: ***4***

Enter candidate's name: ***Daly***

Enter candidate's vote: ***1050***

Enter candidate's name: ***Murphy***

Enter candidate's vote: ***250***

Enter candidate's name: ***Kelly***

Enter candidate's vote: ***807***

Enter candidate's name: ***Burke***

Enter candidate's vote: ***1003***

CANDIDATE VOTES RECEIVED % OF VOTES

Daly 1050 33.76

Muphy 250 8.04

Kelly 807 25.95

Burke 1003 32.25

Total Votes:3110

Winner of the election is: Daly

Given the *Election* class template which consists of the following variables and methods:

private int numCandidates;  
private int totalVotes;  
private String[] name ;  
private int [] votes ;

public void setNumCandidates(int num)

public void addCandidate(int cindex, String cname, int cvotes)

public int calcTotalVotes()

public int getTotalVotes()

public int calcWinner()

public void printResults()

Write the code in the method:

public void setNumCandidates(int num) which is setter method for numCandidates and create arrays for name[] and vote[]

public void addCandidate(int cindex, String cname, int cvotes) which inserts the name and votes of the candidate into the arrays at the location cindex.

public int calcTotalVotes() which calculate and return the total of all votes in the election.

public int getTotalVotes()which is the getter method of totalVotes.

public int calcWinner() find the maximum votes in array and return the index of the array.

public void printResults() output the candidate’s name, vote received, percentage, totalVotes, and the name of the winner.