# Hands-on Experiment # 8: Worksheet

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No more than 3 students per one submission of this worksheet.

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## Part A: Checking if an array is sorted from small to large

Class IsSorted is given. Its main method is implemented for you.

Write method `public static boolean isSorted(int[] a).`

This method returns true if the array is sorted from small numbers to large numbers. It returns false otherwise. You **must not change** the main method.

(5 marks) List all your source code for method here.

```
public class IsSorted {

  public static boolean isSorted(int[] a) {
    for (int i = 0; i < a.length - 1; i++) {
      if (a[i] > a[i + 1]) return false;
    }
    return true;
  }

  public static void main(String[] args) {
    int[] a = { 1, 2, 2, 3, 4, 5 };
    int[] b = { 2, 6, 1, 32, 4, 5 };
    int[] c = { 1, 2, 0, 3, 4, 5 };

    System.out.println(isSorted(a) + ", expected to be true");
    System.out.println(isSorted(b) + ", expected to be false");
    System.out.println(isSorted(c) + ", expected to be false");
  }

}
```

(1 mark) Compile/Run your code and paste a screen shot here.

```
winnaries@Nattawats-MacBook-Pro assignment-8 % java IsSorted
true, expected to be true
false, expected to be false
false, expected to be false
```

## Part B: Reverse an array

Class ReverseArray is given. Its main method is implemented for you.

- Write method `public static void printArray(int[] a).` This method prints array content (separated by comma) in one line.
- Write method `public static int[] reverse(int[] a).` This method returns array that is a reverse of array a.

  Your main method **must not be** changed.

  Your main method must print the followings:

  ```
  5,4,3,2,1
  5,4,32,1,6,2
  ```

(6 marks) List all your source code for method `printArray` here.

```
public static void printArray(int[] a) {
  System.out.print(a[0]);
  for (int i = 1; i < a.length; i++) System.out.printf(", %d", a[i]);
  System.out.println();
}
```

(7 marks) List all your source code for method `reverse` here.

```
public static int[] reverse(int[] a) {
  int length = a.length;
  int[] b = new int[length];
  for (int i = 0; i < length; i++) b[i] = a[length - i - 1];
  return b;
}
```

## Part C: Rock Paper Scissors

Class RPS is given. It is a complete rock, paper, scissors game that you can play. An example play is as follows:

```
Please type the number of rounds.
3
Round1:
Please type your choice of R or P or S
P
Your move: P, AI move: R-> you win
Round2:
Please type your choice of R or P or S
R
Your move: R, AI move: P-> you lose
Round3:
Please type your choice of R or P or S
P
Your move: P, AI move: R-> you win
```

You task is to modify the program such that it records all choices made by player and AI, and can list all of them before the program finishes. An example run of a modified program is shown below:

```
Please type the number of rounds.
3
Round1:
Please type your choice of R or P or S
P
Your move: P, AI move: S-> you lose
Round2:
Please type your choice of R or P or S
R
Your move: R, AI move: S-> you win
Round3:
Please type your choice of R or P or S
S
Your move: S, AI move: R-> you lose
-----------------------
Your moves were:
P,R,S
AI moves were:
S,S,R
```

You must make your program support as many rounds as possible (100 or even 2000 rounds should be runnable).

(6 marks) List all your source code of the modified main method here. Highlight what you added or modified from the original program! If you write additional method(s), please list their source code too.

```
public static void main(String[] args) {

  Scanner s = new Scanner(System.in);

  int rounds = 0;
  while (true) {
    System.out.println("Please type the number of rounds.");
    try {
      rounds = s.nextInt();
      break;
    } catch (Exception e) {
      System.out.println("Not an integer, please try again");

    }
  }

  String[] selectionMem = new String[rounds];
  String[] aiSelectionMem = new String[rounds];

  for (int i = 1; i <= rounds; i++) {
    System.out.println("Round" + i + ":");
    String selection = "";
    while (true) {
      System.out.println("Please type your choice of R or P or S ");

      selection = s.next();
      if (selection.equals("R") || selection.equals("P") || selection.equals("S")) {
        selectionMem[i - 1] = selection;
        break;
      }
    }

    String aiSelection = aiRandom();
    aiSelectionMem[i - 1] = aiSelection;
    if (selection.equals(aiSelection)) {
      System.out.println("Your move: " + selection + ", AI move: " + aiSelection + "-> draw");
    } else if (selection.equals("R") && aiSelection.equals("S")
        || selection.equals("P") && aiSelection.equals("R")
        || selection.equals("S") && aiSelection.equals("P")) {

      System.out.println("Your move: " + selection + ", AI move: " + aiSelection + "-> you win");
```

```
    } else {
      System.out.println("Your move: " + selection + ", AI move: " + aiSelection + "-> you lose");
    }

  }

  s.close();

  System.out.println("----------------------");
  System.out.println("Your moves were:");
  printArray(selectionMem);
  System.out.println("AI moves were:");
  printArray(aiSelectionMem);
}

public static void printArray(String[] a) {
  System.out.print(a[0]);
  for (int i = 1; i < a.length; i++) System.out.printf(", %s", a[i]);
  System.out.println();
}
```

Submit this worksheet (by only one member of the group) via http://www.myCourseVille.com (Assignments > Assignment 8) **within the day after your lecture**.