# AP Computer Science A - Code Tracing Questions

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

## Question 1: Loop and Conditional

public static void mystery1(int n) {  
 int x = 1;  
 int y = 1;  
 while (2 \* y <= n) {  
 y = y \* 2;  
 x++;  
 }  
 System.out.println(x + " " + y);  
}

**What is printed when mystery1(40) is called?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Question 2: Array Manipulation

public static void mystery2(int[] arr) {  
 for (int i = 0; i < arr.length - 1; i++) {  
 if (arr[i] > arr[i + 1]) {  
 arr[i] = arr[i] + arr[i + 1];  
 arr[i + 1] = arr[i] - arr[i + 1];  
 arr[i] = arr[i] - arr[i + 1];  
 }  
 }  
}

**Given:** int[] nums = {7, 3, 8, 4, 1, 9};

**After calling mystery2(nums), what are the contents of nums?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Question 3: 2D Array Traversal

public static int mystery3(int[][] mat) {  
 int sum = 0;  
 for (int r = 0; r < mat.length; r++) {  
 for (int c = 0; c < mat[0].length; c++) {  
 if (r == c) {  
 sum += mat[r][c];  
 }  
 }  
 }  
 return sum;  
}

**Given the 2D array:**

int[][] grid = {{2, 5, 1},  
 {3, 4, 6},  
 {7, 8, 9}};

**What value is returned by mystery3(grid)?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Question 4: Recursion

public static int mystery4(int n) {  
 if (n <= 1) {  
 return n;  
 }  
 return mystery4(n - 1) + mystery4(n - 3);  
}

**What value is returned by mystery4(5)?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Show your work (trace through the recursive calls):**

## Question 5: String Manipulation

public static String mystery5(String str) {  
 String result = "";  
 for (int i = 0; i < str.length(); i++) {  
 if (i % 2 == 0) {  
 result = str.substring(i, i + 1) + result;  
 } else {  
 result = result + str.substring(i, i + 1);  
 }  
 }  
 return result;  
}

**What is returned by mystery5(“COMPUTER”)?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

## Question 6: ArrayList Operations

import java.util.ArrayList;  
  
public static void mystery6(ArrayList<Integer> list) {  
 for (int i = list.size() - 1; i >= 0; i--) {  
 if (list.get(i) % 2 == 0) {  
 list.add(i, list.get(i) / 2);  
 }  
 }  
}

**Given:** ArrayList<Integer> nums = new ArrayList<>(); **nums contains:** [5, 8, 3, 12, 7]

**After calling mystery6(nums), what does nums contain?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_