

Code Analysis Camas Invite 2020

You are permitted either one 8.5 by 11 inch, double-sided reference sheet or two 8.5 by 11 inch, single-sided reference sheets. You are also permitted to have **blank** scratch paper to help keep track of your work.

You are not permitted to use any other resources, including computers (beyond the scope of taking the test), calculators, or cell phones.

You are required to stay in the test tab until you submit the test for grading!

Time spent outside of the test window will be closely monitored and will be subject to scrutiny. Do not open any other tabs, check your email, or perform any other actions on your computer until you have completed and submitted your test. Failure to follow this rule will result in investigation and possible disqualification from the event.

This test is composed of four sections.

Section 1: Snippets (32 points)

Section 2: Troubleshooting (40 points)

Section 3: Large Code 1 (20 points)

Section 4: Large Code 2 (16 points)

Total: 108 points

Section 1: Snippets

For the code snippets below, determine the resulting output. Each problem is worth 4 points.

1. (4.00 pts)

```
public class One {
    public static void main(String args[]) {
        int j = 10;
        for (int i = 0; i <= 9; i++)
            j=(j+3*i/2)/3;
        System.out.println(j);
    }
}
```

2. (4.00 pts)

```
public class Two {
    public static void main(String args[]) {
        double j = 5;
        for (int i = 0; i < 7; i++)
            j = i%2==0&&j<=10 ? j+i/2 : j-i/3;
        System.out.println(j);
    }
}
```

3. (4.00 pts)

```
public class Three {
    public static void main(String args[]) {
        int a = 8;
        int b = 6;
        System.out.print(a<<(~b+a<<1));
    }
}
```

4. (4.00 pts)

```
public class Four {
    public static void main(String args[]) {
        for (int i = 1; i <= 10; i++)
            if (((i % 5) == 0) || ((i % 4) == 0))
                System.out.print("A");
            else if ((i % 3) == 0)
                System.out.print("B");
            else if ((i % 2) == 0)
                System.out.print("C");
            else
                System.out.print("D");
    }
}
```

5. (4.00 pts)

```
public class Five {
    public static void main(String args[]) {
        int[] A = {1,3,2,1,0,1};
        String B = "SciOly";
        for(int i = 0; i <= 5; i++)
            System.out.print(B.substring(i,i+A[i]));
    }
}
```

6. (4.00 pts)

```
public class Six {
    public static void main(String args[]) {
        int i = 0;
        int j = 's';
        while((i + j)/2 < 'Z')
            i++;
        System.out.print((char) i);
    }
}
```

7. (4.00 pts)

```
public class Seven {
    public static void main(String args[]) {
        String string = "Strings are things";
        int i = string.indexOf("ing");
        int j = string.lastIndexOf("ing");
        System.out.println(string.substring(i,j));
    }
}
```

8. (4.00 pts)

```
public class Eight {
    public static void main(String args[]) {
        int x = 2;
        int y = 3;
        while(x < y) {
            x = 2*(x+1);
            y = y + 7;
        }
        System.out.println(x);
        System.out.println(y);
    }
}
```

Section 2: Troubleshooting

For each snippet of code below, determine if there is an error that will prevent the code from running. If there is an error, enter what line the error is on (1 point), describe concisely and specifically why the code does not run properly (2 points), and describe how to correct it (2 points). If there is no error, simply write "no error". You do not need to write the output of the code.

9. (5.00 pts)

```
1 public class One {
2     public static void main(String args[]) {
3         double j = 10;
4         boolean i = true;
5         int k = -5;
6         System.out.println((int) j + (int) i + (int) k);
7     }
8 }
```

10. (5.00 pts)

```
1 public class Two {
2     public static void main(String args[]) {
3         int x = 3.0 > 2.0 ?int(2.0) : 3;
4         System.out.print(x);
5     }
6 }
```

11. (5.00 pts)

```
1 public class Three {
2     public static void main(String args[]) {
3         int i = 2;
4         int[] j = new int[1];
5         j += i;
6     }
7 }
```

12. (5.00 pts)

```
1 public class Four {
2     public Static Void Main(String args[]) {
3         int x = 0;
4         int y = 2;
5         int z = 5;
6         while(x+y+z < y*z){
7             x = y;
8             y++;
9         }
10    }
11 }
```

13. (5.00 pts)

```
1 public class Five {
2     public static void main(String args[]) {
3         double[] array[] = {{1,2},{3,4},{5,6}};
4         for (int i=0 ; i<(array.length) ; i++ ) {
5             for (int j=0 ; j<array[i].length ; j++)
6                 System.out.println(array[i,j]);
7         }
8     }
9 }
```

14. (5.00 pts)

```
1 public class Six {
2     public static void main(String args[]) {
3         String string = "Lemony Snicket";
4         if (string.charAt(string.length()- 5) == 'c'){
5             System.out.print("true");
6         }
7     }
8 }
```

15. (5.00 pts)

```
1 public class Seven {
2     public static void main(String args[]) {
3         String s = "\\\"'\\\"'\\\"";
4         System.out.printf("%s",s);
5     }
6 }
```

16. (5.00 pts)

```
1 public class Eight {
2     public static void main(String args[]) {
3         double k = 5;
4         for (int i = 0; i <= 6; i++){
5             k += --k- --k+-k++;
6         }
7         System.out.println(k);
8     }
9 }
```

Section 3 – Large Code 1

Analyze the large section of code below and determine the output. (20 points)

17. (20.00 pts)

```

public class BigOne {
    static void functionOne(int arr[][]){
        int[][] arr2 = new int[2][5];
        int k1 = 0;
        int k2 = 0;
        for(int i = 0; i < 2; i++){
            for(int j = 0; j < 5; j++){
                int a = arr[i][j];
                if(a%2==0){
                    arr2[0][k1] = a;
                    k1++;
                }
                else{
                    arr2[1][k2] = a;
                    k2++;
                }
            }
        }
        functionThree(arr2);
        functionTwo(arr2);
    }
    static void functionTwo(int arr[][]){
        int[][] arr2 = new int[2][5];
        boolean flag = false;
        for(int i = 0; i < 4; i++){
            if(arr2[0][i]==0){
                if(arr[0][i]%10>arr[0][i+1]%10){
                    flag = true;
                    arr2[0][i] = arr[0][i];
                }
                else{
                    arr2[0][i] = arr[0][i+1];
                    arr2[0][i+1] = arr[0][i];
                }
            }
        }
        if(arr2[0][4]==0){
            arr2[0][4] = arr[0][4];
        }
        for(int j = 0; j < 4; j++){
            if(arr2[1][j]==0){
                if(arr[1][j]%9>arr[1][j+1]%9){
                    flag = true;
                    arr2[1][j] = arr[1][j];
                }
                else{
                    arr2[1][j] = arr[1][j+1];
                    arr2[1][j+1] = arr[1][j];
                }
            }
        }
        if(arr2[0][4]==0){
            arr2[0][4] = arr[0][4];
        }
        if(flag){
            functionTwo(arr2);
        }
        else{
            functionThree(arr2);
        }
    }
    static void functionThree(int arr[][]){
        for(int i = 0; i < 2; i++){
            for(int j = 0; j < 5; j++){
                System.out.print(arr[i][j] + " ");
            }
        }
        System.out.println("");
    }
    public static void main(String args[]){
        int arr[][] = {{28, 1, 17, 10, 5},{13, 2, 26, 15, 24}};
        functionOne(arr);
    }
}

```

```
}  
}
```

Section 4 – Large Code 2

Analyze the large section of code below and determine the output. Both "flag" and "add" can be accessed by any function (do not worry about variable scope) (16 points)

18. (16.00 pts)

```
public class BigTwo{  
    public static boolean flag = false; //This can be used and modified by any function  
    public static int add = 0; //This can be used and modified by any function  
  
    public static boolean functionOne(){  
        if(flag){  
            flag = false;  
            return(flag);  
        }  
        else{  
            flag = true;  
            return(!flag);  
        }  
    }  
  
    public static void functionTwo(int a){  
        if(a%2 == 0){  
            functionOne();  
            add += 3;  
        }  
        if(a%3 == 0){  
            add += 1;  
            if(functionOne() == flag){  
                add += 2;  
            }  
        }  
        if(a%5 == 0){  
            add += 2;  
            if(functionOne() || flag){  
                add += 2;  
            }  
        }  
        functionThree(a);  
    }  
  
    public static void functionThree(int a){  
        System.out.print(a+add);  
        System.out.print(" ");  
        System.out.println(flag);  
    }  
  
    public static void main(String args[]){  
        int arr[] = {7, 25, 21, 16, 45, 20, 36, 30};  
        for(int i = 0; i < arr.length; i++){  
            flag = false;  
            add = 0;  
            functionTwo(arr[i]);  
        }  
    }  
}
```

Please carefully check over you answers and ensure that you have correctly addressed each question if you have time remaining. Partial credit will be given where appropriate.