# CS 312 – Exam 2 – Spring 2023 SOLUTIONS

## Expressions - 2 points each
## TA Owner: Minerva/Saul

1. false
2. false
3. true
4. yes

## Assertions - 0.5 points each, max of 8
## TA Owner: Siddh

| | `num1 != 0` | `count > 0` | `temp == num2` |
|---|---|---|---|
| **Point A** | A | N | S |
| **Point B** | A | S | S |
| **Point C** | A | A | A |
| **Point D** | S | S | S |
| **Point E** | N | S | S |
| **Point F** | S | S | S |

## Code Tracing - 2 points each
## TA Owner: Pranav

The grading notes will be updated while we grade. Be sure to keep this document open while you are grading. Also, there may be ways to get more than 2 points off. That is intentional. The max off for the question is still 2.

| # | Console Output | Grading Notes |
|---|---|---|
| 1 | (not console output) a. -12 b. no | -1 for a<br>-1 for b |
| 2 | `***midnights***` | -1 incorrect number of asterisks<br>-1 incorrect position of asterisks<br>-1 more than one 'midnights' |
| 3 | `6` | |
| 4 | `/\/\/\/\` | -1 for any minor deviation (/\/\/\)<br>-2 for more than one minor deviation (/\/\) |
| 5 | `6 8 true` | -1 for each incorrect item (content, present/not present) |
| 6 | `13 10.27 1989` | -1 for each incorrect item (content, present/not present) |
| 7 | `6.12ErasMean` | -1 for each incorrect word<br>-1 for each incorrect formatting |
| 8 | `-47 9` | |
| 9 | `[-8, 2, 1, 0, 6][0, 0, 0, -1, 2]` | Note: The numbers are all on one line.<br>-1 for using { instead of [ |
| 10 | `[5, 3, 6] 2` | -1 for minor deviation (missing 2)<br>-1 for each diff (max 2)<br>-1 for using { instead of [<br>-1 One wrong number |
| 11 | `[-2, 7, 0, 3][-10, -10, 0, 7][3, 3, 6, 1]` | Note: The numbers are all on one line.<br>-1 for each diff (max 2)<br>-1 for using { instead of [<br>-1 no commas<br>-1 not all on one line |
| 12 | `  #    Item   Quant    Cost   Total`<br>`  1   pizza       1   19.99   19.99`<br>`  2   drink       4    2.50   10.00` | |
| | #14 Notes - Spacing doesn't have to be exact.<br>-1 heading titles not lined up<br>-1 data columns aren't lined up<br>-1 data or heading columns aren't right justified | |

## Program 1 - Graphics
## TA Owner: Austin

```
16      public static void drawBoard(DrawingPanel dp, Graphics gr) {
17          dp.setBackground(Color.WHITE);
18          gr.setColor(Color.BLACK);
19          int numRowsCols = BOARD_SIZE / CIRCLE_SIZE;
20          for (int row = 1; row <= numRowsCols; row++) {
21              for (int col = 1; col <= numRowsCols; col++) {
22  |               // only draw a square row and col are
23                  // NOT both even or both odd
24                  if ((row % 2 != 0 && col % 2 == 0) ||
25                          (row % 2 == 0 && col % 2 != 0)) {
26                      // draw a circle
27                      gr.fillOval((row - 1) * CIRCLE_SIZE,
28                              (col - 1) * CIRCLE_SIZE,
29                              CIRCLE_SIZE, CIRCLE_SIZE);
30                  }
31              }
32          }
```

| Item | Line # | Item | Points |
|---|---|---|---|
| A | 16 | Method declaration | +1 void return type<br>+1 dp and gr parameters |
| B | 17-18 | Color | +1 set background to WHITE<br>+1 set color to BLACK |
| C | 20-21 | Loops | +4 outside loop for each row<br>+4 inside loop for each column |
| D | 24-29 | Circles | +4 determine circle placement for odd/even row<br>+4 draw circle, correct location, height, width |
| X | N/A | Instructions | MAX of -5, take off only if not reflected above<br>-2 Unnecessary code<br>-2 Redundant or inefficient code<br>-2 Seriously incorrect style guide issue<br>-2-4 Java syntax not allowed<br>-2-4 Not following instructions |

## Program 2 - Files
## TA Owner: Kaylee

```
13    public static void printTextNoHTML(Scanner input) {
14        // loop for each line in the file
15        while (input.hasNextLine()) {
16            String line = input.nextLine();
17            Scanner lineScan = new Scanner(line);
18            // loop for each token in the line
19            while (lineScan.hasNext()) {
20                String token = lineScan.next();
21                // look for tag at the beginning of token
22                if (token.charAt(0) == '<') {
23                    // remove tag
24                    int tagEnd = token.indexOf(">");
25                    token = token.substring(tagEnd + 1);
26                }
27                // look for tag at the end of token
28                int secondTagBegin = token.indexOf('<');
29                if (secondTagBegin != -1) {
30                    // remove tag
31                    token = token.substring(0, secondTagBegin);
32                }
33                System.out.print(token + " ");
34            }
35            System.out.println();
36            lineScan.close();
37        }
38    }
```

| Item | Line # | Item | Points |
|---|---|---|---|
| A | 13 | header | +1 void return<br>+1 Scanner parameter |
| B | 15-16 | outside loop | +2 loop while hasNextLine()<br>+1 get next line |
| C | 19-20 | inside loop | +2 loop while hasNext()<br>+1 get next token |
| D | 22-26 | tag at beginning of token | +2 determine if there is a tag at the beginning<br>+2 remove the tag |
| E | 28-34 | tag at end of token | +2 determine if there is a tag at the end<br>+2 remove the tag |
| F | 33-35 | printing | +2 print the token at end of inside loop<br>+2 print a newline at the end of outside loop |
| X | N/A | Instructions | MAX of -5, take off only if not reflected above<br>-2 Unnecessary code<br>-2 Redundant or inefficient code<br>-2 Seriously incorrect style guide issue<br>-2-4 Java syntax not allowed<br>-2-4 Not following instructions |

## Alternate Solution for Files - HTML Tags

```
13      public static void printTextNoHTML2(Scanner input) {
14          // loop for each line in the file
15          while (input.hasNextLine()) {
16              String line = input.nextLine();
17              String begin, end;
18              while (line.contains("<")) {
19                  begin = line.substring(0, line.indexOf("<"));
20                  if (line.indexOf(">") == line.length() - 1)
21                      end = line.substring(line.indexOf(">"), line.length() - 1);
22                  else
23                      end = line.substring(line.indexOf(">") + 1, line.length());
24                  line = begin + end;
25
26              }
27              System.out.println(line);
28          }
29
30      }
```

## Program 3 - 2D Arrays
## TA Owner: Ramsey

```
21      public static void blackAndWhite(DrawingPanel dp) {
22          Color[][] pixels = dp.getPixels();
23          for (int row = 0; row < pixels.length; row++) {
24              for (int col = 0; col < pixels[0].length / 2; col++) {
25                  int red = pixels[row][col].getRed();
26                  int blue = pixels[row][col].getBlue();
27                  int green = pixels[row][col].getGreen();
28                  int colorAvg = (red + blue + green) / 3;
29                  Color newColor = new Color(colorAvg, colorAvg, colorAvg);
30                  pixels[row][col] = newColor;
31              }
32          }
33          dp.setPixels(pixels);
34      }
```

| Item | Line # | Item | Points |
|---|---|---|---|
| A | 21 | Method header | +1 void return<br>+1 dp parameter |
| B | 22 | pixels array | +2 declare pixels array<br>+2 use dp.getPixels() |
| C | 23-24 | loop through pixels | +2 outside loop for pixel rows<br>+2 inside loop for pixel columns |
| D | 25-30 | change color | +2 get red, green and blue using Color methods<br>+2 average red, green and blue<br>+2 create new Color with average for red, green and blue<br>+2 change the pixel to the new color |
| E | 33 | update drawing panel | +2 use dp.setPixels() |
| X | N/A | Instructions | MAX of -5, take off only if not reflected above<br>-2 Unnecessary code<br>-2 Redundant or inefficient code<br>-2 Seriously incorrect style guide issue<br>-2-4 Java syntax not allowed<br>-2-4 Not following instructions |