**CMSC 203 Lab 5**

**Memory Mapping**

1. Draw the memory map of the following variable int w and one-dimensional array of type int.

int w = 14;

int [] x = new int [8];

A drawing of a rectangular object with numbers

Description automatically generated

1. Draw the memory map of the following two-dimensional ragged array of ints.

int[][] y = {{4, 8, 15}, {16, 23, 42, 10}, {8, 30}};

A drawing of a cell phone

Description automatically generated

1. Draw the memory map of the following one-dimensional array of type String.

String[] z = new String[4];

for (int i = 0; i < z.length; i++) {

z[i] = "element " + i;

}

A diagram of a cell phone

Description automatically generated

1. a. Write a shallow copy of the following in code. (Assume the five animal objects are already instantiated.)



Animal[] zoo = {tiger1, elephant2, giraffe3, monkey4, ape5};

Animal[] copy;

1. Draw the memory map.

A diagram of a number of objects

Description automatically generated with medium confidence

1. a. Write the deep copy of the following in code.

Animal[] zoo = {tiger1, elephant2, giraffe3, monkey4, ape5};

Animal[] copy;

1. A diagram of a computer

   Description automatically generated with medium confidenceDraw the memory map.

1. What is garbage collection? Where does it happen?



1. What is the difference between the two operators, equals() and ==?

