

CS 302 Practice Set 1 Solutions

1) a. What is a CPU?

b. Describe the difference between primary and secondary storage in computers.

c. What do we mean by peripheral devices?

2) Is this an algorithm? Note: Remember what has to be true of an algorithm.

Suppose you run a kennel and you have a row of cages full of cats and dogs. Your supervisor tells you to move the animals around so that the cats and dogs are grouped together, rather than being randomly arranged in their cages. Your co-worker suggests the following plan:

While the row of cages is not sorted

 Locate the first cat cage followed by a dog cage or vice versa and switch them.

Is this an algorithm and (briefly) why or why not?

3) Circle the mistakes in this code and write what is wrong. Note: the only mistakes you need to find are ones that you should recognize from class or chapter 1 of the text.

```
public class Adder
{
    //This program prints out the addition of two numbers
    public static void main(String[] args)
    {
        int x = 5;
        int y = 3;
        int sum = 0;
        System.out.println("x is 5 and y is 3

        sum = 8

        System.out.println("The sum of x and y is );
        System.out.println(Sum);
    }
}
```

4) Algorithm Problem. Remember that an algorithm does not need to be written in Java. It just needs to be explained well enough that the reader can tell how it works. Also, later in your study of computer science you will learn how to evaluate how 'good' an algorithm is, but for this problem all I care is that your algorithm works. You do not need to evaluate its performance.

Directions: Suppose you are given n points in a plane, each specified by their (x,y) coordinate and you need to find the pair of points that are closest together. Write an algorithm that does this. Math reminder: the distance between the points (x,y) and (a,b) is defined as $\sqrt{(x-a)^2+(y-b)^2}$.

5) Programming Problem.

Project: Using Java code, write a program that prints the picture of an animal to the screen. (Choose your own animal rather than imitating mine.)

For example, my version of this program prints this wolf to the console window:

```
*           *
* **** *
* # # *
*           *
*   * *
*         *
*         *
*         * * *
*       * * *
*     * * *
* * * * * * * * * * * * * * * *
```