CSE 1300 - Assignment 1 Spring 2024

Description:

For this assignment you'll be working on Computational Thinking skills: Decomposition, Algorithmic Thinking, Abstraction and Pattern Recognition.

This is an individual assignment, but you can attend a CCSE Tutoring Session if you get stuck and need help.

Please create a new document and type your answers into it along with including your full name at the top of the document. Make sure to label each of your answers clearly. All answers should be in a single document.

Decomposition

List the Items:

Grocery store aisles are usually organized into categories so that it is easier for shoppers to find what they are looking for. Below is a picture of aisle signage. List some items you would expect to see in this aisle.
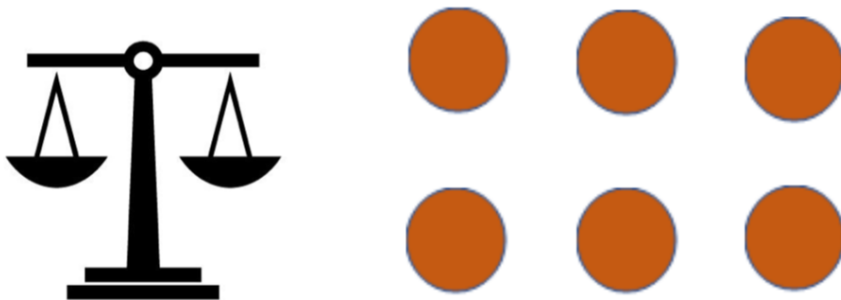

You must list at least five items that are not already listed in the sign above.
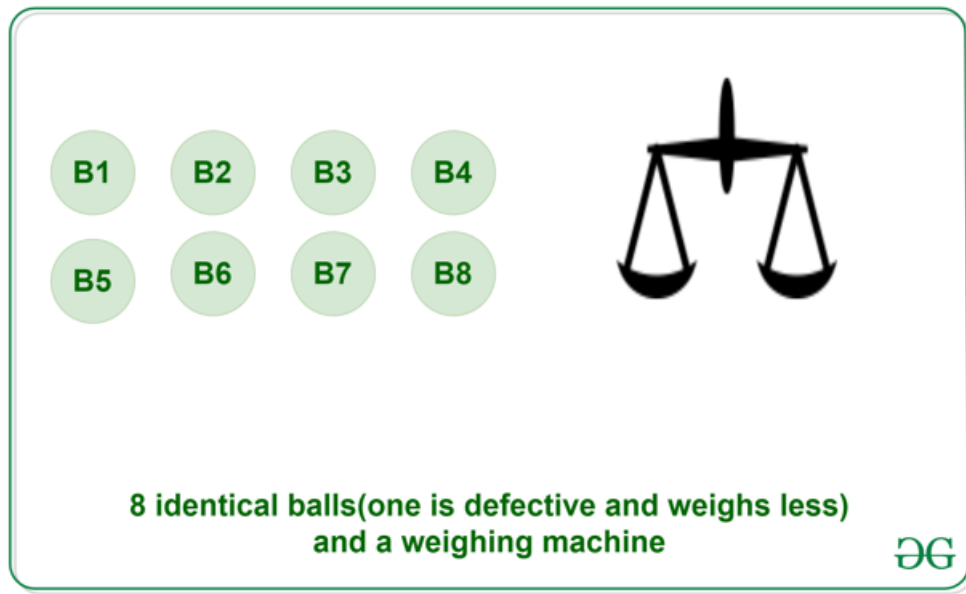
Algorithmic Thinking

Six Ball Puzzle:

You are provided with six identical balls and a measuring instrument. Out of the six balls, five of them are equal in weight and one of the balls is slightly heavier. You can't tell which one is heavier by looking at it or by holding it. The task is to find the heavier ball, but you will only get to use the scale twice. You cannot create or use anything else to weigh the balls, you must use the scale that was given to you.

Eight Ball Puzzle:

Now, instead of six balls, you are provided with eight identical balls and a measuring instrument. Out of the eight balls, seven balls are equal in weight and one of the balls weighs less. The task is to find the defective ball, but you will only get to use the scale twice. You cannot create or use anything else to weigh the balls, you must use the scale that was given to you.

8 identical balls(one is defective and weighs less) and a weighing machine

Abstraction

Create a sign:

Grocery store aisles are usually organized into categories to make it easier for shoppers to find what they are looking for. Below is a picture of a grocery store aisle, assume that you are coming up with the label for the aisle signage and you can only list up to 4 items to generalize all the items you see on the image.

Based on the items that you see in the aisle from the image below, create a single sign and label the sign with four or fewer items that would tell shoppers what to find on this aisle.

Pattern Recognition

Sequence Calculation:

For the given tables below, determine the sequence and then replace x and y with the appropriate values.

Steps:
   a) Identify sequence of calculations.
   b) Solve the values of W, X, Y, & Z based on the sequences.

Table 1:

A	B	C	D
7	4	8	20
6	5	7	23
4	8	5	27
6	W	3	33
9	5	4	X

Table 2:

E	F	G	H
7	4	3	19
6	5	7	-19
4	8	5	7
6	Y	3	21
9	5	4	Z

List the calculation sequence using the column headers (A-D, E-H) and list the values for each of the variables (W-Z). *Example: A + B – C = D. W = 16, X = 12*

Submitting:

1. Please create a new document and type your answers into it along with including your full name at the top of the document.
2. Make sure to label each of your answers clearly.
3. Once you are happy with your solutions, **save your file as PDF**.
4. All answers should be in a single PDF file when submitted.
5. Go to Gradescope, find Assignment 1 under "Assignments", and submit the file.

| Results | Code |

6. After submitting, click Code in the upper right to verify that your file was uploaded correctly and that it is the correct file and file type (PDF).
7. Be sure to submit before the deadline.