CSE 1300 - Assignment 1

Spring 2025

This assignment builds on computational thinking skills. You will apply **Decomposition**, **Algorithmic Thinking**, **Abstraction**, and **Pattern Recognition** to solve real-world problems.

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

Instructions:

1. **Document Setup:**
   - Create a new text document using Microsoft Word.
   - At the top, include your **full name**, **KSU ID** and the **assignment number**.
   - Label each answer clearly.
2. **Submission Guidelines:**
   - Save your document as a **PDF**.
   - Submit your file on D2L under Assignments -> "Assignment 1" before the deadline.

QUESTION 1 - Decomposition

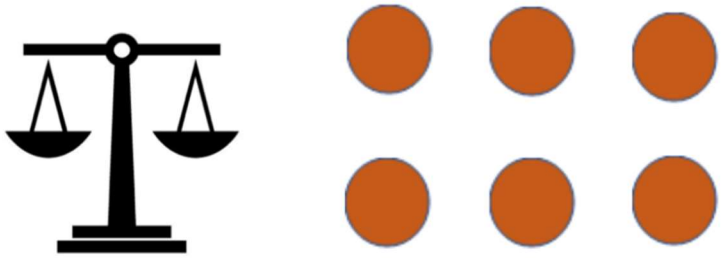
Scenario:
A zoo is organizing its animal enclosures into categories to help visitors navigate the space. Below is a picture of one of the enclosures.

Task:
List at least **five animals** you would expect to find in this enclosure that are not already mentioned in the signage.

QUESTION 2 – Algorithmic Thinking

Scenario:
You are provided with a set of coins and a balance scale. Among the coins:

- *In **Puzzle 1**, there are **six balls**. Five balls weigh the same, and one is heavier.* 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.



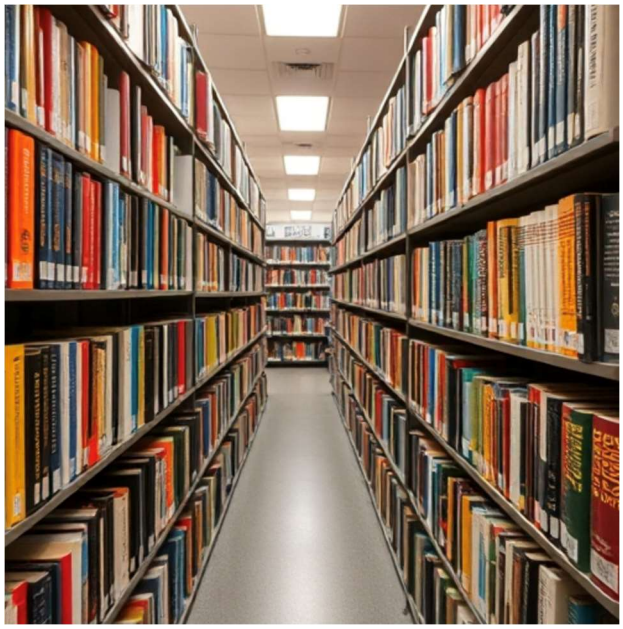
- *In **Puzzle 2**, there are **eight balls**. Seven balls weigh the same, and one is lighter*. Now, instead of six balls, you are provided with eight identical balls and a measuring instrument. Out of the eight balls, seven balls are equal in weight and one of the balls weighs less. The task is to find 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.

You can only use the scale **twice** to find the odd ball in both puzzles.

Task:
Describe the steps (algorithm) to identify the odd ball in each puzzle.

QUESTION 3 - Abstraction

Scenario:
A bookshelf at the library has books arranged by general topics. Based on the image provided, you need to summarize the content of the shelf.



Task:
Come up with a **label** for the shelf. Your label should consist of **four or fewer words** that represent the topics of all the books on the shelf.

QUESTION 4 - Pattern Recognition

Scenario:
Two tables below show numeric sequences based on calculations.

Task:

1. Identify the sequence (e.g., "A + B - C = D").
2. Solve for the missing values (**W, X, Y, Z**) based on the identified sequence.

Table 1:

A	**B**	**C**	**D**
10	5	3	18
8	6	4	18
7	5	2	16
W	4	2	14
6	3	1	**X**

Table 2:

E	**F**	**G**	**H**
12	8	3	17
9	7	2	14
8	6	1	13
Y	5	2	12
7	4	3	**Z**

Submitting Your Work

1. Ensure all answers are included in a single document.
2. Save the document as a **PDF**.
3. Submit via D2L before the deadline. Verify your file upload is correct.