**Lab #1: "Basic Set Operations"**

**Objective:** Implement foundational set operations without using pre-built libraries or classes.

**Requirements:**

* Sets can contain integers, strings, or any data type.
* **Do not use built-in set classes or their methods**. Examples:
  + C#: Avoid **HashSet<T>**
  + Python: Do not use **set()**
  + Java: Avoid **HashSet<E>**
  + JavaScript: Do not use **Set**
  + And so on…

**Tasks:**

1. **Set Creation and Manipulation (Score: 60-74)**
   * **createSet(elements)**: Creates a set from a list of elements, removing any duplicates.
     + Input: [1,2,2,3]
     + Output: [1,2,3]
   * **addElement(set, element)**: Adds an element to the set if it's not already present.
     + Input: ([1,2,3], 4)
     + Output: [1,2,3,4]
   * **removeElement(set, element)**: Removes an element if it exists in the set.
     + Input: ([1,2,3,4], 4)
     + Output: [1,2,3]
   * **containsElement(set, element)**: Returns a boolean indicating if an element is present in the set.
     + Input: ([1,2,3], 4)
     + Output: False
2. **Advanced Set Operations (Score: 75-89)**
   * **union(setA, setB)**: Returns a new set that's the union of the two sets.
     + Input: ([1,2,3], [3,4,5])
     + Output: [1,2,3,4,5]
   * **intersection(setA, setB)**: Returns a new set that's the intersection of the two sets.
     + Input: ([1,2,3], [3,4,5])
     + Output: [3]
   * **difference(setA, setB)**: Returns a set containing elements in setA but not in setB.
     + Input: ([1,2,3], [3,4,5])
     + Output: [1,2]
   * **complement(setA, universalSet)**: Returns the complement of setA in relation to a universal set.
     + Input: ([1,2,3], [1,2,3,4,5])
     + Output: [4,5]
3. **Expression Evaluator (Score: 90-100)**
   * **evaluateExpression(expression, setsDict)**: Given a string expression and a dictionary of sets, compute the result of the expression.
     + Input:
       - Expression: **"A intersection B union C"**
       - **setsDict = {'A': [1,2,3], 'B': [3,4,5], 'C': [5,6,7]}**
     + Output: **[3,5,6,7]**

Начало формы