Homework 2: Code Contracts

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Task 1

• Implement data structure in C#
  ▪ Elements: *integer* type, duplicates allowed
  ▪ Access: using element index or actual value
  ▪ Operations
    • void Add(int val)
    • int Get(int index)
    • int GetHigher(int val)
      ▪ It should return the least element greater than val
    • void Remove(int index)
    • void RemoveAll(int val)
    • void Sort()
    • int FindMin()
    • bool Contains(int val)
    • void Clear()
    • int Size()
Task 2

- Define contracts for all operations provided by your data structure
  - Contracts should capture the expected behavior
    - All typical usage patterns supported by the operations
  - Try to cover also some important corner cases
    - Example: index out of bounds
Task 3

- Write small test client for the data structure
  - It should exercise typical usage patterns and some important corners cases

- Note for tasks 1+3
  - We will not judge the quality of your code in C#
    - Some prefer and use other languages (Java, C, C++, ...)
Task 4

- Use static checker to verify the implementation of your data structure against the contracts

- Use the runtime checker on your small test client

- Necessary software
  - Visual Studio + plugins for Code Contracts
Document your solution

- Informally describe what non-trivial properties you specified using Code Contracts
  - “why you did what you did”
- Positive experience: what contracts (properties) you were able to successfully verify
- Negative experience: what are the major observed limitations of Code Contracts
- For each reported spurious error (if you get some), try to explain why the particular checker reported the error in your opinion
- Also discuss missed errors (and possible reasons)
Organization

- Deadline: **7.5.2018**

- Submission
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