**Assignment 09 – Marking Scheme**

**General Marking Notes**

* The deadline for grading is Monday, December 2nd at 12:00pm (noon).
* If you have any questions email the official marking thread (send it to [cs135-markers@cs.uwaterloo.ca](mailto:cs135-markers@cs.uwaterloo.ca)) with the assignment instructor(s) CC’d (Charles Clarke: charles.clarke@uwaterloo.ca) so that all ISA’s and TAs can hear about clarifications or changes to the marking scheme.
* Please email [cs135@uwaterloo.ca](mailto:cs135@uwaterloo.ca) when you are finished marking each week. **Include a list of the common errors you encounter**.
* Guidelines from Assignment 08 carry forward.

|  |
| --- |
| **Global: Explicit Recursion**  Students are not allowed to use explicit recursion in this assignment. They can only use abstract list functions.  Errors:   * One function uses explicit recursion * More than one function uses explicit recursion |
| **Q3, Q4b, Q4c, Q4d: Purpose Statements**  Students should provide purposes for Q3, Q4b, Q4c, Q4d’s main functions.  Error:   * Missing purpose for the function |
| **Q3, Q4b, Q4c, Q4d: Contract Correctness**  Correct contracts should be similar to the ones written at the end of this document (not including format).    Select the appropriate rubric level based on how many contracts are correct. Any of the following errors make a contract incorrect:   * Missing contract (or missing function block). * Adding untrue requirements (including restricting “output”) * Incorrect type or incorrect number of types listed (other than the exceptions below)   Exceptions:   * An Int with a requirement that it must be a non-negative number is the same as a Nat (**leave a comment,** but do not deduct any marks) * If students specify unneeded, but true, requirements (for example, a requirement that a Nat must be greater than or equal to 0), **leave a comment,** but do not deduct any marks |
| **Q4: Using (listof Any) Instead of (listof X)**  Although we’re accepting both (listof X) and (listof Any) for Q4, (listof Any) is technically wrong. We’ll be deducting rubric levels here for (listof Any) to avoid deducting too many marks off of contract correctness.  Error:   * (listof Any) was used at least once in Q4b, Q4c, or Q4d’s contract. |
| **Q3, Q4b, Q4c, Q4d: Examples**  Examples should include at least 2 **distinct**(check-expect … …) function calls testing the basic functionality of the code for the main function. Students may use the same examples as described in the assignment.  Error:   * Function contains less than 2 examples |

**Contracts:**

Q3:

;; sequence: Num Num (anyof ‘arithmetic ‘geometric) -> (Nat -> (listof Num))

Or

;; sequence: Num Num Sym -> (Nat -> (listof Num))

;; requires: the symbol is (anyof ‘arithmetic ‘geometric)

Q4b:

;; rotate-left: (listof X) -> (listof X)

Or

;; rotate-left: (listof Any) -> (listof Any)

Q4c:

;; prefix: Nat (listof X) -> (listof X)

Or

;; prefix: Nat (listof Any) -> (listof Any)

Q4d:

;; insert-at: Nat X (listof X) -> (listof X)

Or

;; insert-at: Nat X (listof Y) -> (listof (anyof X Y))

Note: The position of X and Y does not matter, i.e. Y (listof X) is fine.

Or

;; insert-at: Nat Any (listof Any) -> (listof Any)