

University of Waterloo
CS135 Fall 2025 Midterm Exam
Monday, October 27 at 7:00pm to 8:50pm

Sign your name, in pen:	
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Guidelines

- No Calculators or any other aids allowed.
- Follow the conventions from lecture.
- Write your answers clearly and legibly in the space provided. If you need more space, use the extra pages at the end of the exam and indicate that you have done so.
- In case of a perceived ambiguity, clearly state your assumptions.

Prob.	Max
1	6
2	3
3	6
4	7
5	6
6	6
7	6
8	12
Total	52

Instructions:

- All code is to use the Beginning Student language with List Abbreviations.
- You may include helper functions in your solutions unless otherwise stated.
- Unless otherwise specified, for questions where you are required to provide a list value, you may use either `cons` or `list`. For stepper questions, switching between these notations does not count as a "step".
- Throughout the exam, you should follow good programming practices as outlined in the course such as appropriate use of constants, meaningful identifier names and helper functions.
- If you believe there is an error in the exam, notify a proctor. An announcement will be made if a significant error is found.
- If you require more space to answer a question, you may use the blank page(s) at the end of this exam, but you must clearly indicate in the provided answer space that you have done so.
- It is your responsibility to properly interpret a question.
 - Do not ask questions regarding the interpretation of a question; it will not be answered and you will only disrupt your neighbours.
 - If there is a non-technical term you do not understand, you may ask for a definition.
 - If, despite your best efforts, you are still confused about a question, state your assumptions and proceed to the best of your abilities.

Allowed constructs:

```
( ) [ ] + - * / = < > <= >= ;  
abs acos add1 and append asin atan check-expect check-within cond cons cons? cos  
define e else empty empty? even? exp expt false first inexact? integer? length  
list list? log max min not number? odd? or pi quotient rational? remainder rest  
reverse second sin sqr sqrt sub1 symbol? symbol=? tan third true zero?  
listof Any anyof Bool Int Nat Num Rat Sym
```

Efficiency:

- Functions you write should not have exponential runtimes unless stated.
- Be cautious when using built-in functions such as `append`, `length` and `reverse` in the body of recursive functions since they have $O(n)$ runtimes (even though the stepper simplifies them in a single step).

Documentation:

- You do not need to give purpose, contract or tests unless specifically asked to do so.
- The code you write should follow good coding practice and deductions may be made for bad style or inefficiency.