

**Due date: Tuesday, January 28, 2020, before midnight. We will email you instructions for uploading to your account.**

Exercise 1.1 (20 points)

- a) Why is it useful for a programmer to have some background in language design, even though he or she may never actually design a programming language?  
[2 points]
- b) What programming language has dominated scientific computing over the past 45 years? Also name a newer language that is used in scientific computing (and also used in machine learning)?  
[2 points]
- c) What programming language has dominated business applications over the past 45 years?  
[2 point]
- d) What programming language has dominated artificial intelligence over the past 45 years?  
[2 point]
- e) Name a fairly new programming language and do a web search to find out an application that it is used for.  
[2 point]
- f) What is the disadvantage of having too many features in a language?  
[2 point]
- g) We discussed three types of programming paradigms in class. One of them is imperative languages. Give examples of languages that are imperative. Also, name the other two programming paradigms.  
[2 point]
- h) What is aliasing?  
[2 point]
- i) Why is the von Neumann bottleneck important?  
[2 point]
- j) What are the advantages in implementing a language with a pure interpreter?  
[2 points]