FIT3139: Applied session for week 2

Question 1

Based on the description of the Schelling model discussed in Workshop 1, describe what possible variables you could measure, using the model to understand segregation? What kind of model extensions could be done? What is important to keep in mind when thinking about extensions?

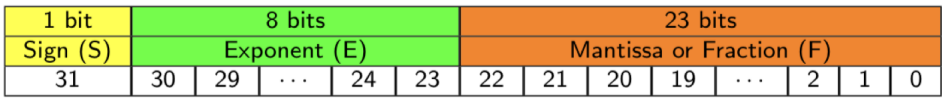
Question 2

A floating point system is given by the numbers b, p, L and U.

- What is the smallest positive normalized floating-point number?
- What is the largest positive normalized floating-point number?
- What is the number of normalized floating-point numbers in a given floating-point system?

Question 3

What is the IEEE-SP representation of the number 172.1.



Question 4

Write a computer program that computes the precision of floating point numbers in Python (or Matlab).

Question 5

Write a script which computes the smallest number ϵ such that $1 + \epsilon > 1$. This number is the machine epsilon. Compare this with the number generated by using the built-in function `eps` in MATLAB or `sys.float_info.epsilon` in Python.

Question 6

As above, develop your own script to determine the smallest positive real number used in MATLAB or Python. Base your algorithm on the

notion that your computer will be unable to reliably distinguish between zero and a quantity that is smaller than this number. Compare your answer with the built-in `realmin` in MATLAB, or `sys.float_info.min*sys.float_info.epsilon` in Python.