1. (Tries)

   a. If the following keys were inserted into an initially empty trie:

   ```
   so boot axe boo jaw boon jaws sore
   ```

   what would the final trie look like? Does the order of insertion matter?

   b. Answer question a. for a compressed trie.

2. (Text compression)

   Compute the frequency array and draw a Huffman tree for the following string:

   ```
   dogs and a cat eat hot pots
   ```

3. (Numerical approximation)

   Write a C program to implement the root finding approximation algorithm from the lecture as the function:

   ```
   double bisection(double (*f)(double), double x1, double x2)
   ```

   Use your program to find roots for

   a. $f(x) = 3x^3 - 5x^2 + 3x - 5$, in the interval $[0.0, 10.0]$

   b. $f(x) = \sin x$, in the interval $[-4.0, -2.0]$

   c. $f(x) = \sin 10x + \cos 5x + \frac{x^2}{10}$, in the intervals $[0.0, 1.0]$ and $[1.0, 2.0]$

   with precision $\varepsilon=10^{-10}$.

Assessment

After you've solved the exercises, go to COMP9024 20T2 Quiz Week 9 to answer 5 quiz questions on this week's assessment and lecture.

The quiz is worth 2 marks.

The deadline for submitting your quiz answers is **Tuesday, 4 August 11:00:00am**.

Please also for this final quiz respect the **quiz rules**:

Do …

- use your own best judgement to understand & solve a question
- discuss quizzes on the forum only **after** the deadline on Tuesday

Do not …

- post specific questions about the quiz **before** the Tuesday deadline
- agonise too much about a question that you find too difficult