## **Foundation Day 1 - Exercises**

### **Non-Technical Questions**

* Tell me a bit about yourself
  + Practice answering this question with a colleague - ensure you can answer this concisely but in sufficient detail to give the interviewer a decent background on who you are. Try to make it interesting and not just a repeat of your CV.

### **Theory Questions**

* What is the difference between an ArrayList and a LinkedList? Try to give answers in terms of performance, how the data structure works and use cases
* What is a singleton? When would you want to use one? Can you give an example use case?
* What is the difference between == and equals?

### **Practical Questions**

* **String Reverse:** Take a string as input and reverse it, you don't need to read from the command line, you can test your function by calling it directly.
  + Optional extensions:
    - Can you do this using Java streams?
    - Can you do this using recursion?
    - Can you think of any other ways to do this?
* **Balanced Parentheses**: Write a function that checks if a given string containing **only** parentheses (e.g., () is balanced, meaning that each opening parenthesis has a corresponding closing parenthesis and they are correctly nested.
  + Can you extend your solution to different types of parentheses, e.g. (), {}, []
  + Is there a good data structure for this type of problem? If so, what is it and why? Can it be done *without* using a data structure?
* **Character Count:** Write a function that takes a list of characters and returns a total count of each of the characters in an appropriate data structure.
  + Optional extension:
    - Can you do this using Java streams?
* **Singleton:** Create a singleton class that follows the singleton design pattern.