# **Quiz 2**

Instructions: create a new repository called ng-ds-test. Within this repo, create a README.md file. Copy and paste all of these questions into this README file and answer them.

1. Name and describe the two main operations of a stack (to add and remove data).

* To add data we use Push: Method is used to Pushes an item onto the top of this stack.
* To remove data we use Pop: Method is used to remove the object at the top of this stack and returns that object as the value of the function.

1. Name and describe the two main operations of a queue (to add and remove data).

* To add data we use Enqueue: Add an item at the tail.
* To remove data we use Dequeue: Remove the item at the head.

1. Draw the tree resulting from adding the following sequence of numbers to an empty tree: 30, 45, 15, 10, 50, 40, 20, 27
2. Is this tree balanced? If not, which rotation needs to be done? (Use the following rotation as an example: rightRotation(30), or leftRotation(10))

* The tree is bal­anced when the dif­fer­ence between heights of sub-trees of any node in the tree is not greater than one.

1. Now add 29. Is the tree balanced? If not, which rotation needs to be done? (Use the following rotation as an example: rightRotation(30), or leftRotation(10))

* The tree is not balanced, I use leftRotation(27).

1. Consider the following tree:  
   ------5  
   ---2-----8  
   -1--3

Now add 0 to the tree. Which one is the first node to go out of balance?

* The first node go out of balance is 5.

1. How do you fix this node? (Use the following rotation as an example: rightRotation(30), or leftRotation(10))

* Do I fix this node using the following rotation: rightRotation(2).

1. What are the four main steps of mergesort?

* Divide.
* Conquer.
* Combine.
* Return.

1. Say you have a program which handles the login queue to a game server. The game server is able to log in one person every one second. Assume that one second must elapse after a person logs in with an empty queue before they are removed from the queue. Draw the state of the queue at 12:00:06, considering the following sequence of events:
   1. At 12:00:00 Hades logs in
   2. At 12:00:00 Ares logs in
   3. At 12:00:00 Zeus logs in
   4. At 12:00:00 Buzz Light Year logs in
   5. At 12:00:02 Kanye West logs in
   6. At 12:00:03 Taylor Swift logs in
   7. At 12:00:03 Darkwing Duck logs in
   8. At 12:00:04 Evil Mickey logs in.
2. Solve <https://www.hackerrank.com/challenges/compare-the-triplets> - be mindful that you are required to print the output to the console in exactly the format that was asked. You are not required to return a value, just print to the console. Also be mindful to use JavaScript.
3. Solve <https://www.hackerrank.com/challenges/mini-max-sum> - be mindful that you are required to print the output to the console in exactly the format that was asked. You are not required to return a value, just print to the console. Also be mindful to use JavaScript.