# EE599 - HW5
# Computing and Software for Systems Engineers

- **THIS IS A VERY SHORT HOMEWORK ASSIGNMENT, ENJOY!**
- Unless specified: for each question that you write code:
    - Provide GTest.
    - Provide runtime analysis.
    - Proof of correctness is not necessary unless specified.
- For submission, please create a zip file of all of your assignments and only submit one file.
    - PLEASE REMOVE ALL FOLDERS STARTING WITH **bazel-*** before submitting. **To do this run : `bazel clean`**
- Leave any extra instructions for the graders in a README text file.
- Our grader should be able to call blaze run/test ... and run your code/test.
- Deadline: Tuesday, Feb 25th, before 6pm.
- Total: 120 points. 100 points is considered full credit.

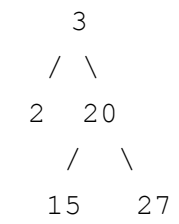
## Question 1 (50 Points. Easy)

Given a binary search tree BST, find its height (maximum depth), i.e. the number of nodes along the longest path from the root node down to the farthest leaf node.

Use the BST class you created in HW4.

Example:

Input:



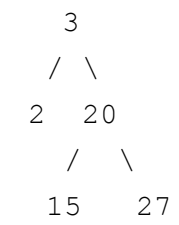
Max Depth = 3.

## Question 2 (70 Points. Medium)

Given a BST, return the inorder traversal in a vector.

Example:

Input:



Output: [2, 3, 15, 20, 27].

- Part 1. Do it recursively.
- Part 2. Do it non recursively.

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# Optional Questions

The goal of this section is to introduce you to more challenging questions and some common problems in coding and algorithms.

- These questions don't have any credits.

- We may not provide complete solutions or grading for them.
- Solving them is completely optional.

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# Question 1

Given a BST, write a function called **kthSmallest** to find the kth smallest element in it the BST.

Note:
You may assume k is always valid, 1 ≤ k ≤ BST's total elements.

**Example 1:**
Input: k = 1



Output: 1

**Example 2:**
Input: k = 3



Output: 3