Exam 1

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Results:	/ 200	Class:	LabVIEW Summer Class
		Date:	

This exam will be out of 200 points. 100 points will come from multiple choice/matching/fill in the blank. 25 points will come form from True False. 75 points will come from writing / interpreting code.

1. Boolean is a

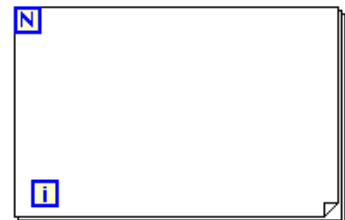   a. Numbers

    b. Letters

    c. Words

    d. **True/False**

2. What is this

    a. For Loop

    b. **While Loop**

    c. Case Loop

3. What is this

    a. **For Loop**

    b. While Loop

    c. Case Loop

4. What is this

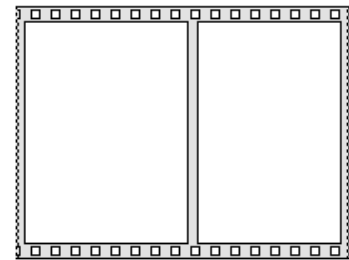   a. **Feedback Node**

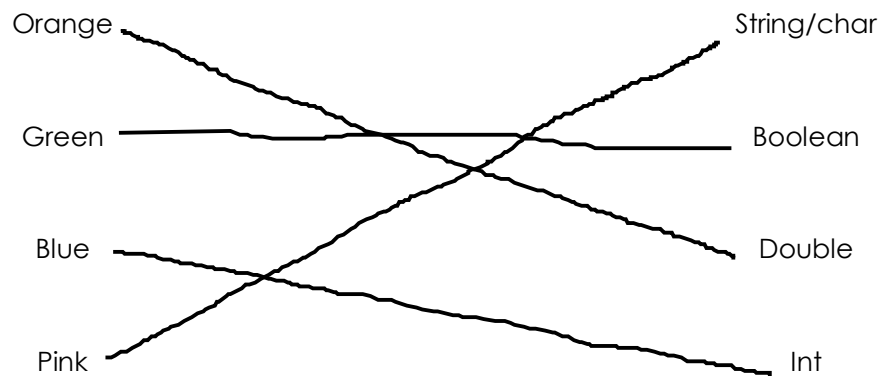   b. Shared Variable

    c. Terminal

5. What is this

   a. Case Structure

   b. Event Structure

   c. Flat Sequence

6. Match the following color with their data type.

Orange   String/char

Green   Boolean

Blue   Double

Pink   Int

7. Complete the logic table for an AND gate.

Input 1	Input 2	Output
0	0	0
0	1	0
1	0	0
1	1	1

8. What does this LabVIEW Function do?

    a. Negate Integers

    b. Negate Doubles

    c. Negate Boolean

9. What company provides the Talon SRX and software?

    a. Cross The Road Electronics

    b. Andy Mark

    c. Arrow

    d. FIRST

10. What's one function we do not do with the Talon SRX

    a. Auto assign motor voltage

    b. PID

    c. Read RPM

    d. Run on PWM

11. What is a potentiometer

    a. Reads RPM

    b. Reads Voltage

    c. Reads angle

12. What is the maximum size of an Integer?

    a. 255 bits

    b. 32 bits

    c. 264 bits

    d. 1 bits

13. What is the maximum bandwidth the FMS allows one robot?

     a. 6 Mb

     b. 7 Mb

     c. 8 Mb

14. Which of the following way is used to troubleshoot a robot? (Circle all that apply)

     a. Breakpoints

     b. Probes

     c. Ask the hardware guy to look at your program

     d. Tracing

     e. Trial and Error

15. What is the IP address to get into RoboRio Imaging? (works on any Rio)

     a. 172.22.11.2

     b. 172.10.30.26

     c. 10.30.26.5.

     d. 10.30.26.2.

16. What are setpoints used for?

     a. To set a point

     b. To pass data to a subsystem

     c. Tell the subsystem what operation to use

     d. Execute a program

17. What must every operation need?
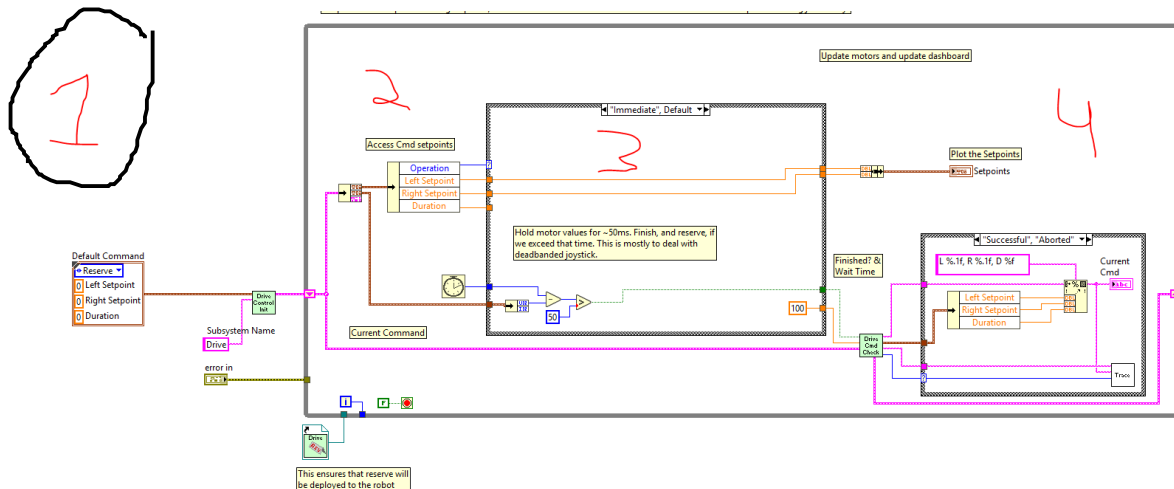
     a. A setpoint

     b. A data value

     c. A command that calls it

     d. A Boolean value

18. What is the default operation?

   a. Read current

   b. Off

   c. Reserve

   d. Immediate

19. Where do you initialize objects in a subsystem? (Circle Number)

20. In Visual Studios, what are version numbers of code called?

   a. Version

   b. Change Set

   c. Iteration

21. In Visual Studios when you have code checked out, what is the term when you check code back in?

   a. Check in pending changes

   b. Upload Code

   c. Upload iteration

   d. Branch

22. What is the correct term(s) for a number in programming? (Circle all that apply)

    (a.) Integer

    b. String

    c. Char

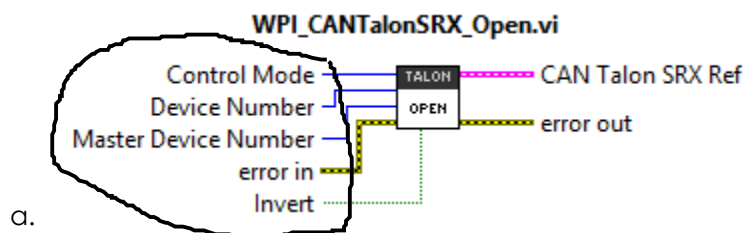   (d. Short)

    (e. Long)

    (f. Double)

23. Where do you program the functions of a subsystem?

    a. Operation

    b. Set point

    c. Command

    (d. Controller)

24. Name two 3026 custom VI.

    a. _____

    b. _____

25. What are the inputs to this VI? (circle them)

WPI_CANTalonSRX_Open.vi

Control Mode
Device Number
Master Device Number
error in
Invert

TALON
OPEN

CAN Talon SRX Ref
error out

    a.

26. What does this symbol mean in LabVIEW?

    a. Broken Wire / Error

27. How do you open the pallet in LabVIEW?

    a. Right Click

28. What are the two possible displays on the front pallet? (they manipulate and show)

    a. Control _____

    b. Indicator _____

29. How many CPU does the RoboRio have?

    a. 2 _____

30. What is the IP address of the RoboRio?

    a. 10.30.26. 2 _____

31. What does a breakpoint do?

    Stops the program at a certain point, used mainly in debugging

32. How many characters can fit in a char?

    1

33. What is a reentrant VI?

    A VI that has a master copy and clones

34. Why would you make a VI reentrant?

    If you need to use a VI more then once in a program

35. When changing a reentrant VI, what must you do?

    Change the master copy

36. What is a terminal?

    passes data to a VI

37. What is this?

    Case Structure with error input

38. What is the largest data type?
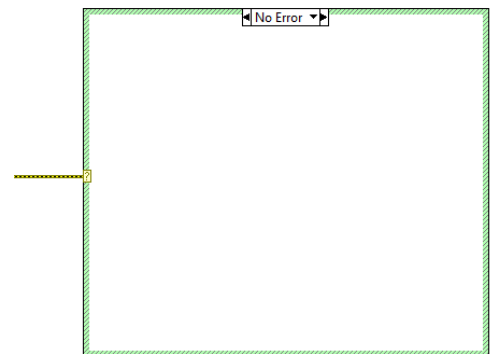
    Double

39. What is the unit of time used in LabVIEW?

    Milliseconds

40. Name the 6 functions of Robot Main?

    default, disconnect
    Finish
    Teleop Enabled
    Autonomus Enabled
    Autonomus disabled, teleop disabled,
    test enabled , test disabled

If the answer is false, change the sentence to make the statement true.

41. (T) F   A case structure can have a double input as its selector.

                                                          contoler
42. T (F)   Functions of a subsystem are programed in the ~~operation~~.

                                             int
43. T (F)   Commands are sent as a ~~string~~.

                                                        delayed
44. T (F)   Read current operation is ran on a ~~terminating~~ loop.

45. T (F)   Integers can be any positive, negative, ~~decimals~~, and zero number.

                                                     set points
46. T (F)   Data values are passed through ~~operations~~.

                                            begin
47. T (F)   Joysticks get initialized in ~~its subsystems~~.

                                           robotics
48. T (F)   Talon SRX is found under the ~~control~~ pallet.

49. T (F)   With both numbers being integers 7/3 = 2.~~333~~

                                                          enter in a formula.
50. T (F)   The formula node lets the user ~~select a formula from memory~~.

Extra Credit (1 points each)

The roboRio runs on the ____Unix____ operating system.

What is the ASCII value for the number 0? ___48___

What is the maximum number in a int? __2147483647__

Give a value, (other than true, false, 0, 1) , that would make a Boolean true and explain why.

 Any number besides 0 is interpreted as true.

What is the official name for PID?

__Proportional__ -- __Integral__ -- __Derivitive__ controller

Coding Question 1
You come across the problem of you need to make a calculator in LabVIEW. You are given the following partial code. It takes three arguments, operand 1, operand 2 and the operation. Complete the code to make this vi functioning. Your default should return 0.
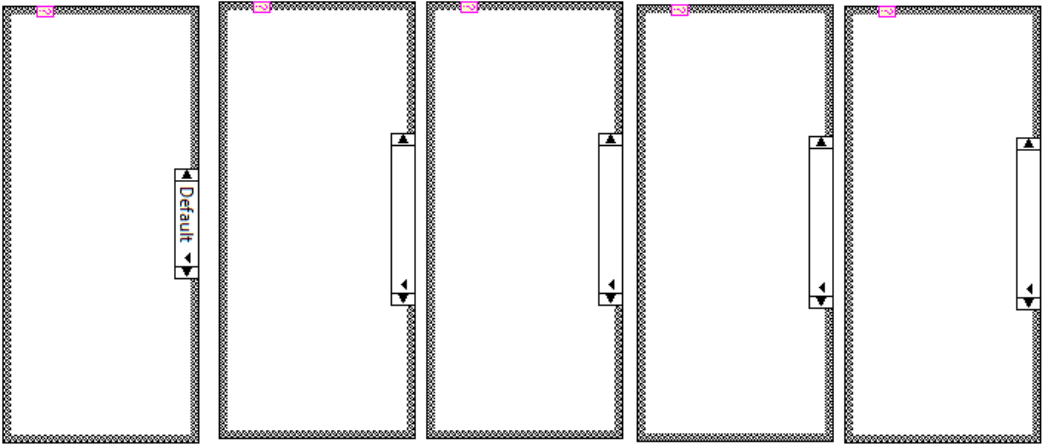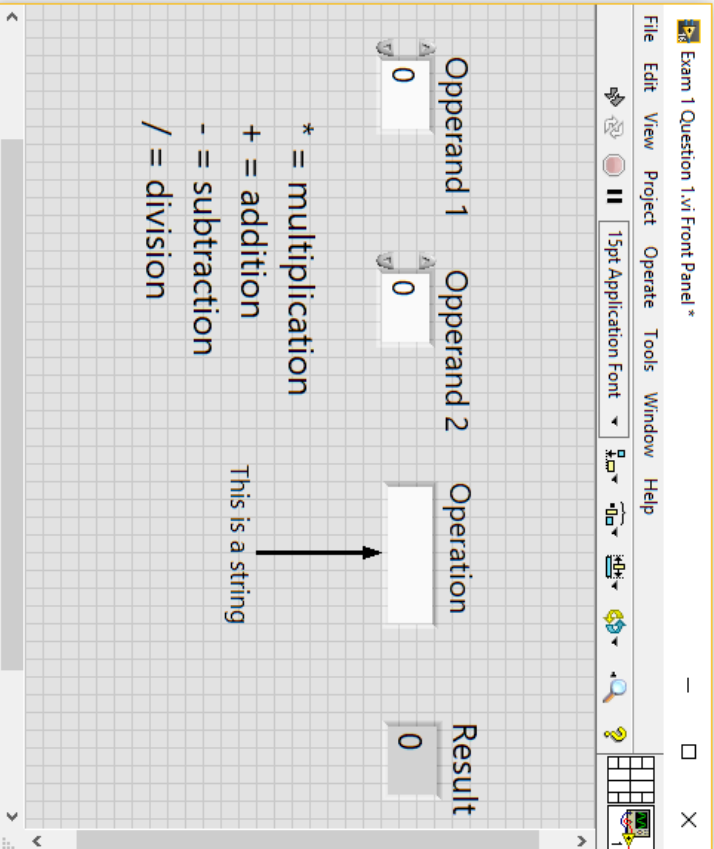
Operation
abc

Opperand 2
123
DBL

Opperand 1
123
DBL

Default ▼

▲ ◄ ▼

▲ ◄ ▼

▲ ◄ ▼

▲ ◄ ▼

Treat this as one case structure

Exam 1 Question 1.vi Front Panel *
File   Edit   View   Project   Operate   Tools   Window   Help

15pt Application Font

Opperand 1   Opperand 2   Operation
0   0

* = multiplication
+ = addition
- = subtraction
/ = division

This is a string

Result
0

Result
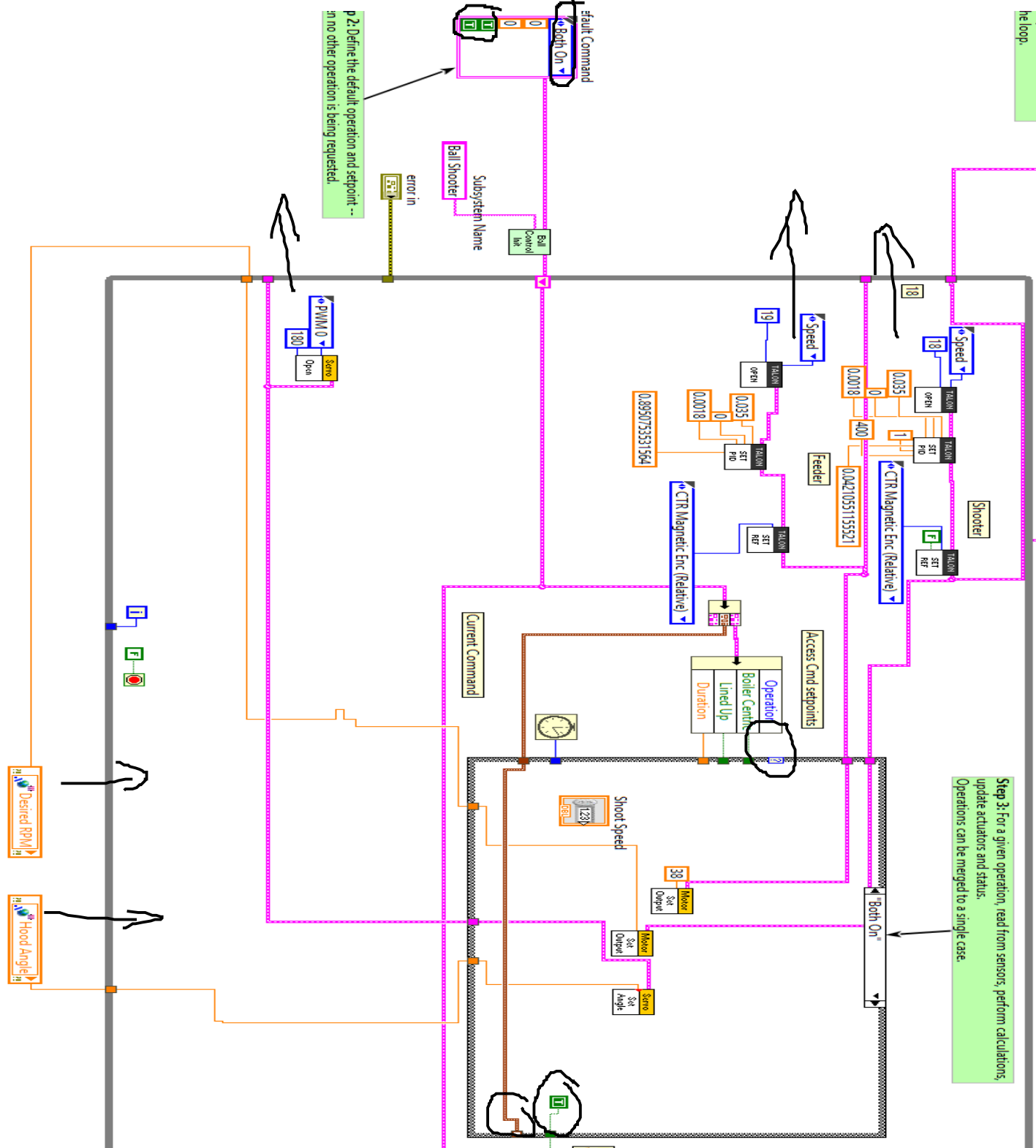1.23
DBL

You may use these in your program
+   /   x   ÷

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Coding Problem 2

Brandon is working on the shooter subsystem for the robot and gives up because it isn't working. Find all the errors in his code and make the proper fixes. All the fixes have to do with command and control. (There are 11 fixes. If things need to be moved, they move in a group. EX: all the components for the shooter would move in a group and count as 1 fix. If you find all 11 you will get 2.5 bonus points. Finding 10 gets full credit.

Step 2: Define the default operation and setpoint -- when no other operation is being requested.

Step 3: For a given operation, read from sensors, perform calculations, update actuators and status. Operations can be merged to a single case.

Coding Problem 3

Write an explanation to what this section of code does. Then solve for distance, hood angle, and desired rpm when COG Y Boiler is 302. Do the same calculation for when the COG_Y is 0.
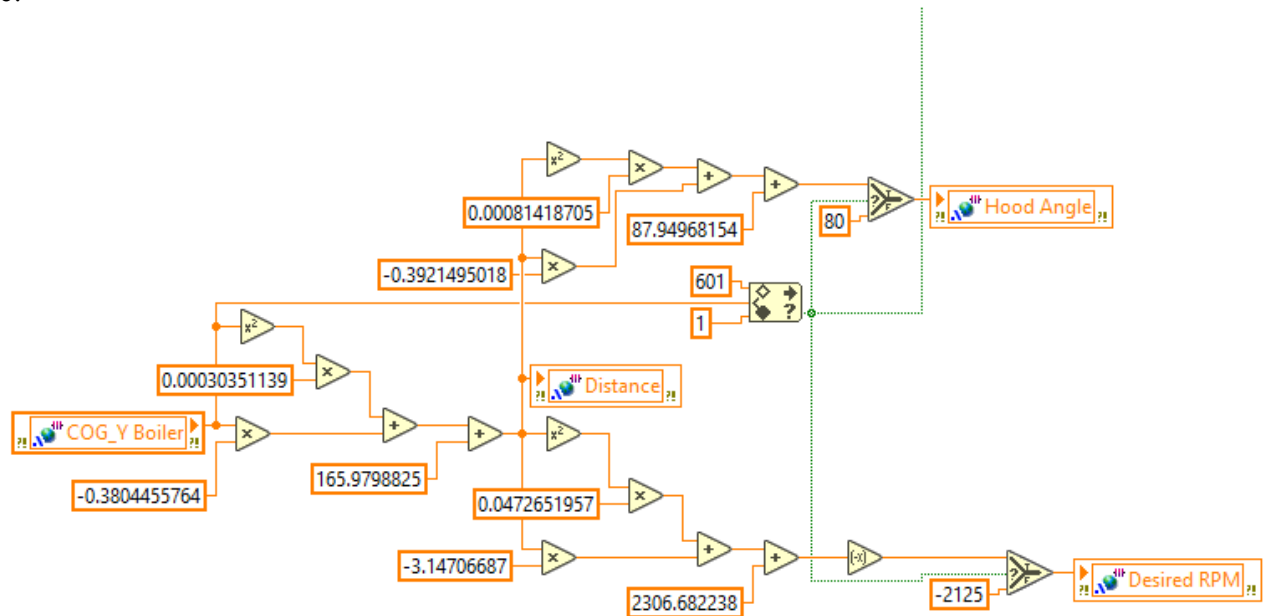
	Calculation 1	Calculation 2
COG_Y Boiler	302	0
Distance	78.7667712408	165.9798825
Desired RPM	2352	-2175
Hood Angle	62.1127141968	80

Detailed Explanation on how this code works:

COG_Y Boiler is sent to the program. It is then ran trough an equation to calculate distance. The distance is then ran through two separate equations. One calculates desired RPM and the other calculates hood angle. If COG_Y is 0 however, the program will default to the calculations in Calculation 2.