**Section 9 Questions**

1. What is a trendline?
   1. A line indicating the general course or tendency of something.
   2. A line connecting all the point of a graph.
   3. A strictly linear line that indicates the general course or tendency of something.
   4. A strictly exponential line that indicates the general course of tendency of something.
   5. All of the above
   6. None of the above
2. What is regression?
   1. A measure of the relationship between two variables.
   2. The relationship between two variables.
   3. A measure of two variables.
   4. A measure of the relationship between several variables.
   5. The relationship between several variables.
   6. None of the above
3. A \_\_\_\_\_\_\_\_ in Excel is generated using a process called \_\_\_\_\_\_\_ ,which is a measure of the relationship between two variables.
   1. Regression; Trendline
   2. Regression; Least squares linear regression
   3. Trendline; Least squares linear regression
   4. Trendline; Regression
   5. Trendline; Error
   6. Error; Trendline
4. Excel uses \_\_\_\_\_\_\_\_\_\_\_\_, which generates the best line to represent the data by minimizing the errors.
   1. Most squares linear regression
   2. Regression
   3. Trendline
   4. Least cubed linear regression
   5. Most cubed linear regression
   6. Least squares linear regression
5. What does least squares linear regression do in Excel?
   1. Generates the best line to represent the data by maximizing the errors.
   2. Generates the best line to represent the data by averaging the errors.
   3. Generates the best line to represent the data by minimizing the errors.
   4. Generates the best line to represent the data by standardizing the errors.
   5. All of the above
   6. None of the above
6. Excel uses least squares linear regression to generate the best line to represent the data by minimizing the errors.
   1. True
   2. False

1. Excel uses most squares linear regression to generate the best line to represent the data by minimizing the errors.
   1. True
   2. False
2. Excel uses least cubed linear regression to generate the best line to represent the data by minimizing the errors.
   1. True
   2. False
3. Excel uses most cubed linear regression to generate the best line to represent the data by minimizing the errors.
   1. True
   2. False
4. Which of these are options for the trendline in Excel?
   1. Exponential
   2. Linear
   3. Logarithmic
   4. Polynomial
   5. Power
   6. Moving Average
   7. All of the above
5. The “coefficient of determination,” more commonly referred to as will be used to determine the “goodness of the fit”.
   1. True
   2. False
6. The “coefficient of determination,” more commonly referred to as , will be used to determine the “goodness of the fit”.
   1. True
   2. False
7. The “coefficient of determination,” more commonly referred to as r, will be used to determine the “goodness of the fit”.
   1. True
   2. False
8. The “coefficient of determination,” more commonly referred to as , will be used to determine the “goodness of the fit”.
   1. True
   2. False
9. The sense of warmth or coldness of a material is its:
   1. Voltage
   2. Resistance
   3. Buoyancy
   4. Temperature
   5. Weight
   6. Pressure
10. \_\_\_\_\_\_\_\_\_ is the measure of the average thermal energy of particles in a material.
    1. Voltage
    2. Resistance
    3. Buoyancy
    4. Temperature
    5. Weight
    6. Pressure
11. \_\_\_\_\_\_\_\_\_ is the thermodynamic property of a substance that is related to the average energy of microscopic motions in a substance.
    1. Voltage
    2. Resistance
    3. Buoyancy
    4. Temperature
    5. Weight
    6. Pressure
12. A \_\_\_\_\_\_\_\_\_ measures electrical resistance changes with temperature.
    1. Breadboard
    2. Resistor
    3. Photoresistor
    4. Thermistor
    5. Potentiometer
    6. Capacitor
13. The following is the circuit diagram symbol for a:



1. Power Source
2. Resistor
3. Photoresistor
4. Thermistor
5. Potentiometer
6. Capacitor
7. When measuring temperature with a thermistor, as resistance decreases, temperature:
8. Increases
9. Decreases
10. Remains constant
11. When measuring temperature with a thermistor, as the temperature decreases, the resistance:
12. Increases
13. Decreases
14. Remains Constant

22. What is an advantage of using thermistors?

1. Non-linear
2. Limited Temperature Range
3. High output
4. Fragile
5. Self-heating
6. Current source required
7. When viewing thermistor data using the Arduino, as analog value increases, the temperature \_\_\_\_\_\_\_\_\_\_.
8. Increases
9. Decreases
10. Remains Constant
11. If the voltage drop across a 10kΩ resistor increases, then the voltage drop across the thermistor \_\_\_\_\_\_\_\_\_\_\_.
12. Increases
13. Decreases
14. Remains constant
15. If the voltage drop across the thermistor decreases, then the resistance of the thermistor \_\_\_\_\_\_\_\_\_\_.
16. Increases
17. Decreases
18. Remains Constant
19. An increase in the analog values read by the Arduino means the resistance of the thermistor is \_\_\_\_\_\_\_\_\_\_\_\_\_, which means the temperature is increasing.
20. Increasing
21. Decreasing
22. Remains Constant

27. A \_\_\_\_\_\_\_\_\_\_\_ correlates analog values to temperature values.

1. Trendline
2. Regression line
3. Correlation equation
4. Temperature equation
5. Calibration equation
6. None of the above
7. A \_\_\_\_\_\_\_\_ is a data type that allows for decimal values to be included in the sketch.
8. Boolean
9. Byte
10. Int
11. Long
12. Float
13. Char
14. A switch that is off is associated with a binary number of 0.
    1. True
    2. False
15. A switch that is off is associated with a binary number of 1.
    1. True
    2. False
16. A switch that is on is associated with a binary number 0.
    1. True
    2. False
17. A switch that is on is associated with a binary number 1.
    1. True
    2. False
18. Computers use digital electronics.
    1. True
    2. False
19. Computers use analog electronics.
    1. True
    2. False
20. A binary number system uses \_\_\_\_\_\_\_\_\_.
    1. Base 2
    2. Base 3
    3. Base 10
    4. Ben 10
    5. 64 bit
    6. 32 bit
21. \_\_\_\_\_\_\_\_\_ is the most commonly used number system.
    1. 64 bit
    2. Base 2
    3. Base 6
    4. 32 bit
    5. Base 10
    6. Binary
22. A single unit of information is called \_\_\_\_\_\_\_\_\_.
    1. Binary
    2. Single
    3. Bit
    4. Bits
    5. Base 1
    6. None of the above
23. How many combinations can a 1-bit register represent?
    1. 0
    2. 1
    3. 2
    4. 3
    5. 4
    6. 5
24. How many combinations can a 2-bit register represent?
    1. 0
    2. 1
    3. 2
    4. 3
    5. 4
    6. 5
25. How many combinations can a 3-bit register represent?
    1. 6
    2. 7
    3. 8
    4. 9
    5. 10
    6. 11
26. How many combinations can a 4-bit register represent?
    1. 8
    2. 10
    3. 12
    4. 14
    5. 16
    6. 18
27. How many combinations can a 5 bit register represent?
    1. 10
    2. 25
    3. 27
    4. 29
    5. 30
    6. 32
28. How many combinations can a 6 bit register represent?
    1. 12
    2. 24
    3. 32
    4. 48
    5. 52
    6. 64
29. How many combinations can a 7 bit register represent?
    1. 14
    2. 32
    3. 49
    4. 128
    5. 136
    6. 142

1. How many combinations can 8 bit register represent?
   1. 16
   2. 64
   3. 256
   4. 324
   5. 368
   6. 402
   7. 412
2. How many combinations can 9 bit register represent?
   1. 512
   2. 548
   3. 562
   4. 582
   5. 597
   6. 603
3. How many combinations can 10 bit register represent?
   1. 988
   2. 1024
   3. 1088
   4. 1112
   5. 1762
   6. 1890
4. What 32 in binary?
   1. 100000 32/2 = 16 | 0
   2. 100001 16/2 = 8 | 0
   3. 110001 8/2 = 4 | 0
   4. 100011 4/2 = 2 | 0
   5. 110011 2/2 = 1 | 0
   6. 111111 ½ = 0 | 1 ^
5. What 49 in binary?
   1. 100011 49/2 = 24 | 1
   2. 100001 24/2 = 12 | 0
   3. 110001 12/2 = 6 | 0
   4. 100111 6/2 = 3 | 0
   5. 111000 3/2 = 1 | 1
   6. 111001 ½ = 0 | 1 ^
6. What is 102 in binary?
   1. 110011 102/2 = 51 | 0
   2. 110001 51/2 = 25 | 1
   3. 100111 25/2 = 12 | 1
   4. 1011001 12/2 = 6 | 0
   5. 1100110 6/2 = 3 | 0
   6. 1000001 3/2 = 1 | 1

½ = 0 | 1 ^

1. What is 52 in binary
   1. 1011 52/2 = 26 | 0
   2. 1101 26/2 = 13 | 0
   3. 110110 13/2 = 6 | 1
   4. 101000 6/2 = 3 | 0
   5. 101100 3/2 = 1 | 1
   6. 110100 ½ = 0 | 1 ^
2. What 17 in binary?
   1. 11001 17/2 = 8 | 1
   2. 10001 8/2 = 4 | 0
   3. 10011 4/2 = 2 | 0
   4. 11011 2/2 = 1 | 0
   5. 11111 ½ = 0 | 1 ^
   6. 1000
3. Variables store information in the form of bits.
   1. True
   2. False
4. Variables store information in the form of \_\_\_\_\_\_\_\_.
   1. Bypes
   2. Base
   3. Bits
   4. Integers
   5. Characters
   6. Binary
5. Predefined data types allow you to choose the best form for a variable.
   1. True
   2. False
6. Predefined \_\_\_\_\_\_\_\_\_\_\_ allow you to choose the best form for a variable.
   1. Data
   2. Data forms
   3. Data types
   4. Date
   5. Date types
   6. Date forms
7. Predefined data types allow you to choose the best form for a \_\_\_\_\_\_\_\_.
   1. Number
   2. Letter
   3. Character
   4. String
   5. Variable
   6. integer
8. What data type holds true or false?
   1. Byte
   2. Boolean
   3. Int
   4. Long
   5. Float
   6. char
9. What data type includes decimal points?
   1. Float
   2. Int
   3. Byte
   4. Char
   5. Long
   6. boolean
10. What data type can be used for single letters?
    1. String
    2. Boolean
    3. Float
    4. Char
    5. Long
    6. Int
11. What data type is used to create sentences?
    1. Char
    2. Float
    3. Long
    4. Boolean
    5. String
    6. Byte
12. What data type can only hold 8- bit numbers?
    1. Long
    2. Float
    3. Char
    4. Byte
    5. Int
    6. Boolean
13. What is the most common data type that is used for whole numbers?
    1. Int
    2. Boolean
    3. Long
    4. Float
    5. Byte
    6. char
14. What data type holds the largest range for whole numbers?
    1. Byte
    2. String
    3. Long
    4. Int
    5. Char
    6. Boolean
15. What do you have to code first to print on a serial monitor?

Serial.begin(1600)

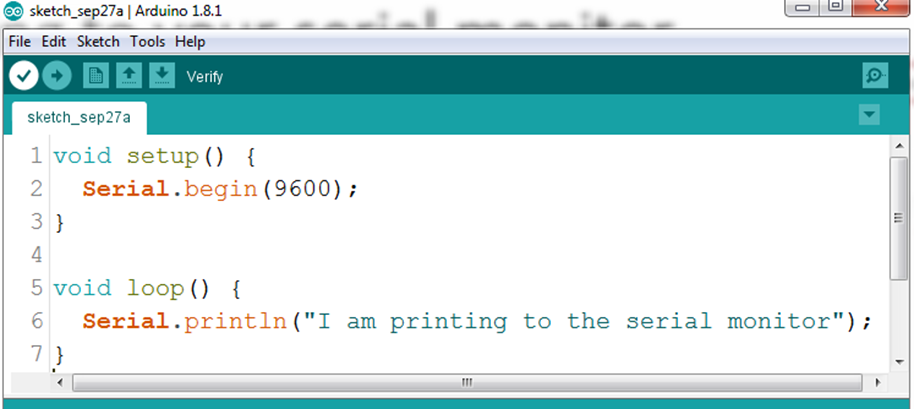
Serial.begin(9600)

Serial.begin(3600)

Void loop()

Serial.println()

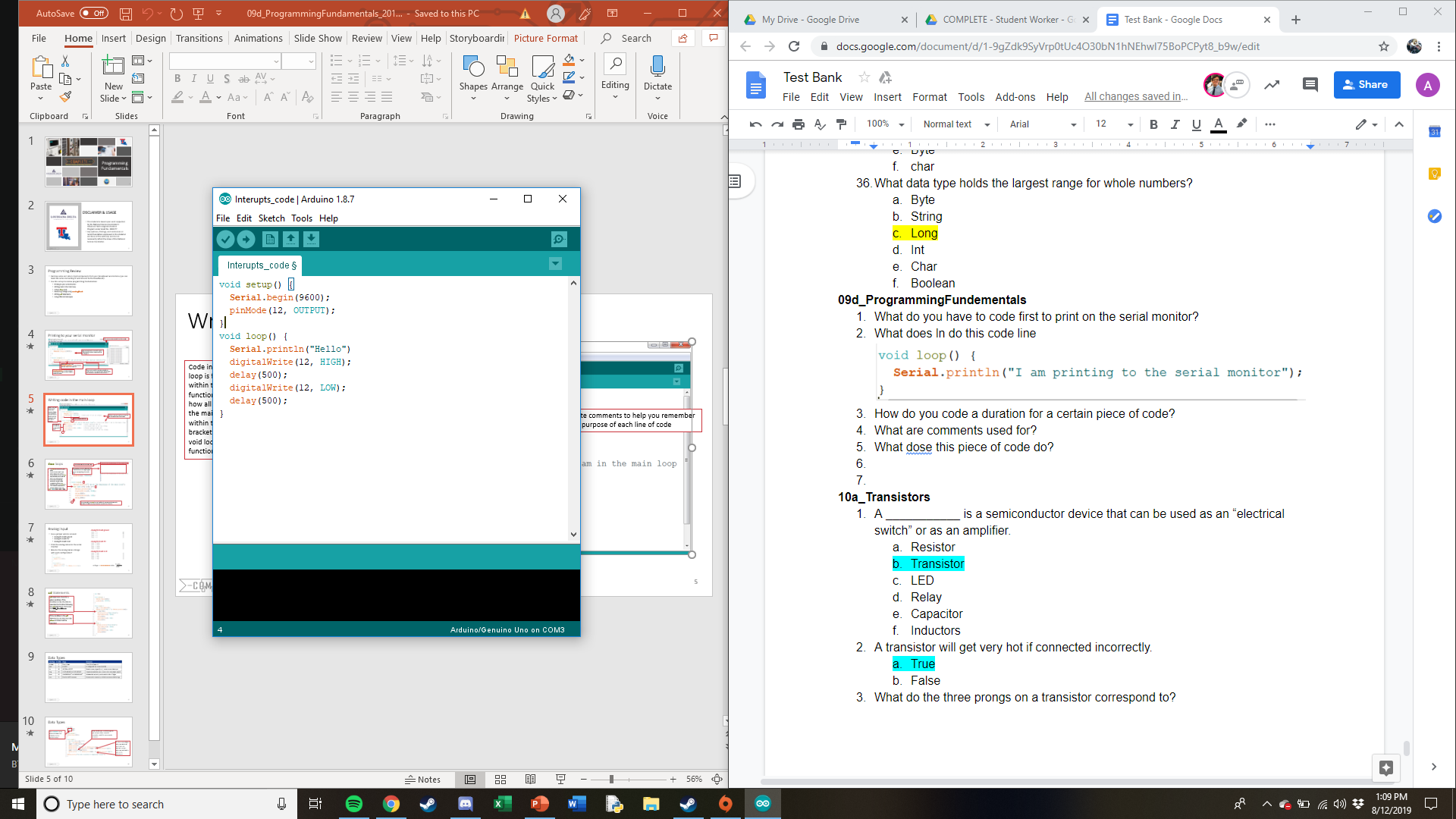
None of the above

1. What does ln do to this line of code?

Creates a new line for the statement

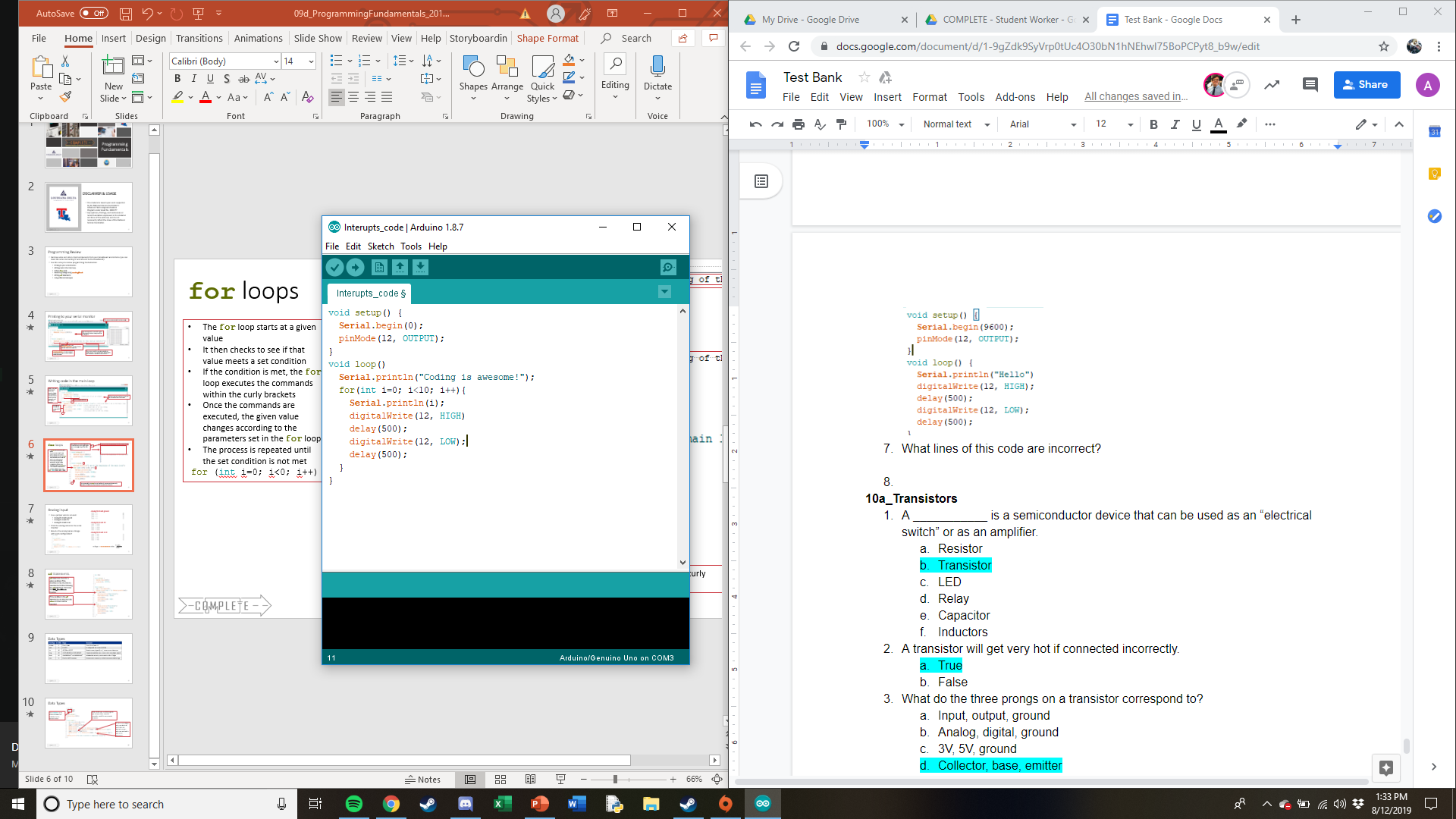
1. How do you incorporate a delay for 5 seconds?
   1. delay(5);
   2. delay(50);
   3. delay(500);
   4. delay(5000);
   5. delay(50000);
   6. delay(5000000);
2. How do you incorporate a delay for .5 seconds?
   1. delay(5);
   2. delay(50);
   3. delay(500);
   4. delay(5000);
   5. delay(50000);
   6. delay(500000);
3. How do you incorporate a delay for 10 seconds?
   1. delay(1);
   2. delay(10);
   3. delay(100);
   4. delay(1000);
   5. delay(10000);
   6. delay(100000);
4. How do you incorporate a delay for 2 seconds?
   1. delay(2);
   2. dealy(20);
   3. delay(200);
   4. delay(2000);
   5. delay(20000);
   6. delay(200000);
5. How do you incorporate a delay for 1 second?
   1. delay(1);
   2. delay(10);
   3. delay(100);
   4. delay(1000);
   5. delay(10000);
   6. dealy(100000);
6. What are the uses for comments when coding in Ardino? (circle all that apply)
   1. To explain what your code is doing
   2. To print instruction onto the Serial monitor
   3. To make your code readable for others
   4. For you to look back on, to better understand your own code
   5. To flex your superior knowledge
   6. To comment out certain part of code to test isolated code for issues or improvements
7. How do you implement comments in your code?
   1. /
   2. \*\*
   3. #
   4. ##
   5. //
   6. /\* \*/
8. What does this piece of code do with an LED? (be as detailed as possible)

Turns the LED on and off for .5 second infinitely



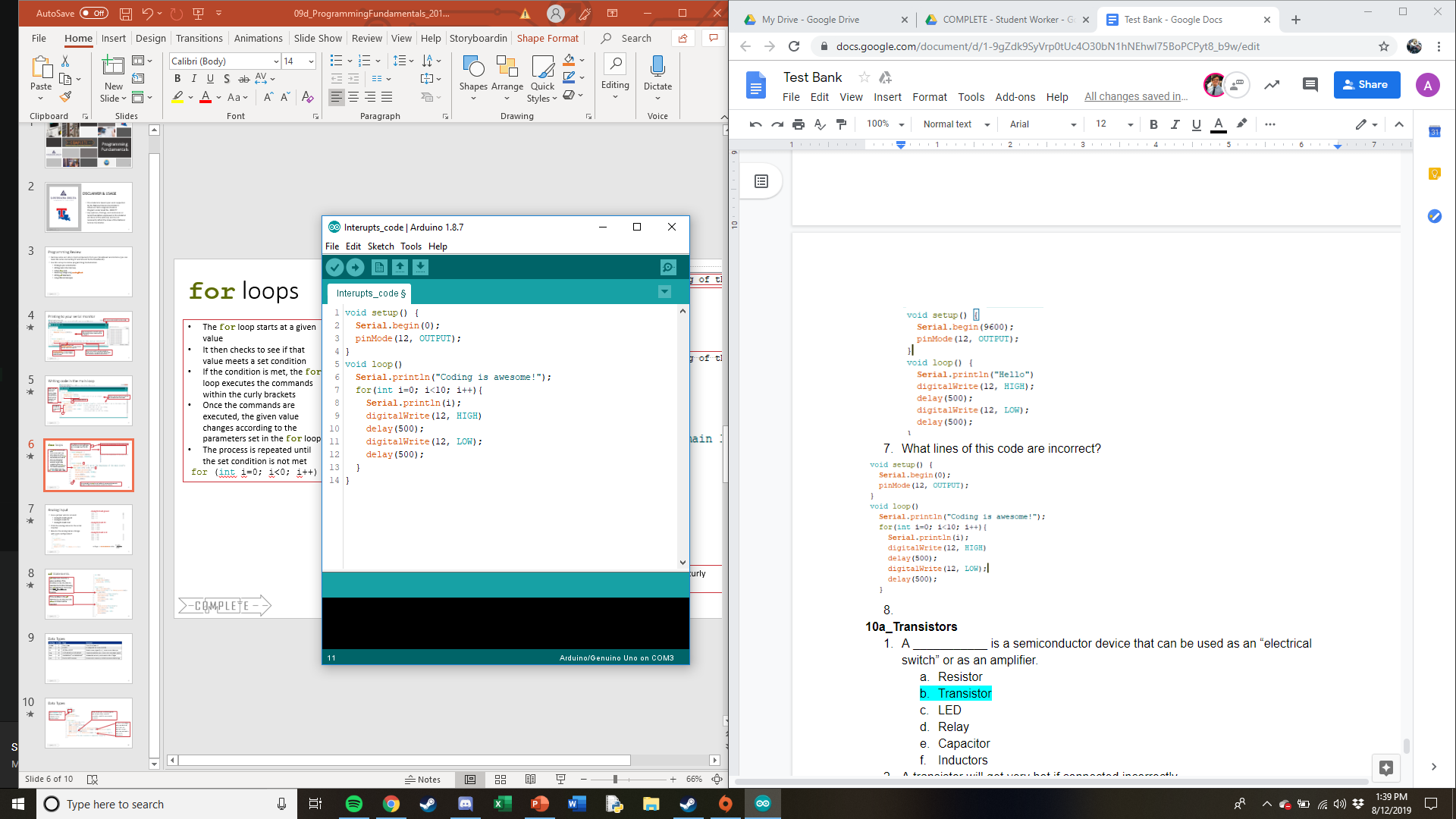
1. What does this piece of code do to an LED? (be as detailed as possible)

Makes the LED blink 10 times in half second intervals



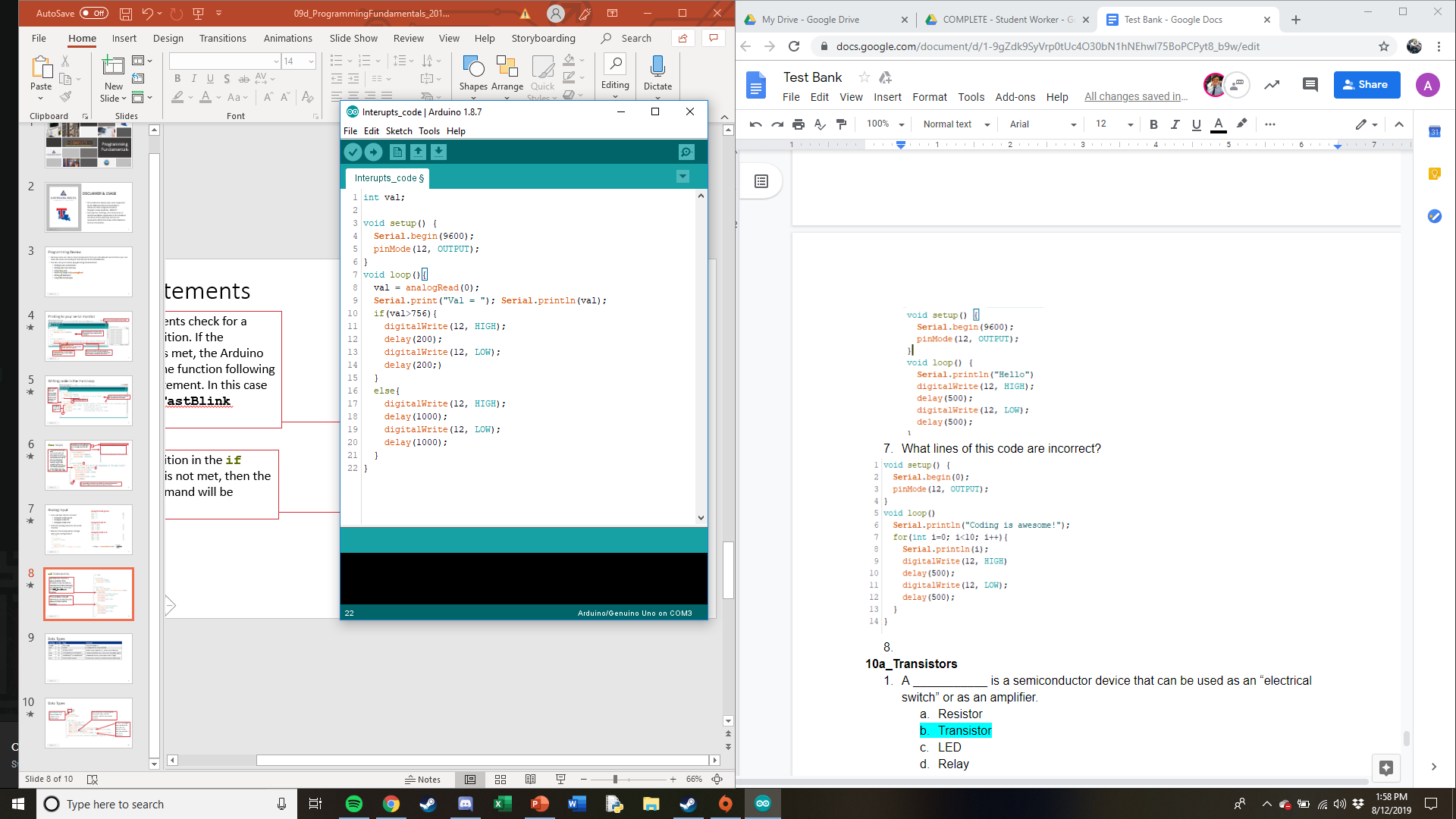
1. What lines of this code are incorrect?

2, 5, and 9



1. What does this code do with an LED? (be as detailed as possible)

Makes it blink fast (.2 second intervals) if the values given are higher than 756, else it makes the LED blink slower (1 second interval).



1. What does Serial.begin() do in Arduino?
   1. Set the data rate in bits per second for serial data transmission.
   2. Set the data rate in micro bits per second for serial data transmission.
   3. Runs a display on the serial monitor.
   4. Starts up the serial monitor.
   5. Set the data rate in gigabits per second for serial data transmission.
   6. None of the above
2. What two things do you need inside pinMode(\_\_\_\_ ,\_\_\_\_ )?
   1. Digital Pin #, HIGH/LOW
   2. Analog Pin #, HIGH/LOW
   3. Digital Pin #, TRUE/FALSE
   4. Analog Pin #, Input/Output
   5. Digital Pin #, Input/Output
   6. Analog Pin #, ON/OFF
3. What two things do you need inside digitalWrite(\_\_\_\_ ,\_\_\_\_)?
   1. Digital Pin #, Input/Output
   2. Analog Pin #, Input/Output
   3. Digital Pin #, HIGH/LOW
   4. Analog Pin #, ON/OFF
   5. Analog Pin #, HIGH/LOW
   6. Analog Pin #, TRUE/FALSE
4. What does pinMode() do in Arduino?
   1. Configures the specified pin to behave either as on or off
   2. Configures all pins to behave either as an input or an output
   3. Configures all pins to behave either as on or off
   4. Configures the specified pin to behave either as True or false
   5. Configures all pins to behave either as true or false
   6. Configures the specified pin to behave either as an input or an output.