Unit 5 Vocabulary (Review and Exam)

1	Accelerometer	a. A sensor that can detect motion, impact and orientation b. Continuously adjusting the system to keep the error close to zero c. The circular path wheels take when a robot rotates in place d. A disc with slots that rotates with a wheel
2	Wheel encoders	a. A sensor that can detect motion, impact and orientation b. Continuously adjusting the system to keep the error close to zero c. The circular path wheels take when a robot rotates in place d. A disc with slots that rotates with a wheel
3	Feedback loop	a. A sensor that can detect motion, impact and orientation b. Continuously adjusting the system to keep the error close to zero c. The circular path wheels take when a robot rotates in place d. A disc with slots that rotates with a wheel
4	Integer division	a. A geometric representation of magnitude and direction b. The truncated answer to a division problem c. A library that includes a set of math functions and constants d. A base 16 number designated with \x
5	Vector	a. A geometric representation of magnitude and direction b. The truncated answer to a division problem c. A library that includes a set of math functions and constants d. A base 16 number designated with \x
6	Math module	a. A geometric representation of magnitude and direction b. The truncated answer to a division problem c. A library that includes a set of math functions and constants d. A base 16 number designated with \x
7	Hexadecimal	a. A geometric representation of magnitude and direction b. The truncated answer to a division problem c. A library that includes a set of math functions and constants d. A base 16 number designated with \x
8	Replacement fields	a. A way to insert special characters in a string b. Information added that tells how to display a number c. A template for formatting a string d. An alternative to the accelerometer
9	Format specifiers	a. A way to insert special characters in a string b. Information added that tells how to display a number c. A template for formatting a string d. An alternative to the accelerometer
10	Escape sequence	a. A way to insert special characters in a string b. Information added that tells how to display a number c. A template for formatting a string d. An alternative to the accelerometer

Unit 5 Review Questions (in Kahoot)

1	What type of values does an accelerometer return?	a. Integers from 0 to 100 b. Integers from -32767 to 32768 c. Floats from -32767 to 32768 d. Boolean values True or False

2	What value is returned by the wheel encoder?	a. A Boolean: True or False b. An integer from -32767 to +32768 c. A float from -32767 to +32768 d. An integer from 0 to 4095
3	What is the value of number? `number = round(3.75)`	a. 4 b. 3 c. -3.75 d. .75
4	Which of the following is FALSE?	a. abs(-5) / 5 == 1 b. -5 / abs(-5) == 1 c. 5 / abs(-5) == 1 d. -5 / abs(5) == -1
5	Which statement is True?	a. 5 / 3 == 5 // 3 b. 5 // 3 > 1 c. 5 // 3 == 2 d. 5 // 3 < 5 / 3
6	What does this code do? `round(dist_cm / tm_sec)`	a. Converts counts to centimeters b. Converts centimeters to counts c. Calculates the track circumference d. Calculates the speed

7	Given the code, what will print?
	`my_string = '$' * 3`
	`print(my_string)`
		a. & * 3
		b. &&&
		c. 333
		d. An error occurs

8	What is printed by the following code: `print(f'{math.pi:.2f}')`	a. 3.14 b. 3.142 c. 03.14 d. math.pi
9	What is the result of this code? `print("{:^25}".format("dog"))`	a. Dog will print with left alignment b. Dog will print with right alignment c. Dog will print with center alignment d. 25.dog will print
10	This code is an example of: `print("\r", end='')`	a. Formatted string b. Format specifier c. Cascaded assignment d. Escape sequence
11	This code is an example of: `left = right = 0`	a. Cascaded assignment b. Augmented assignment c. List comprehension d. Escape sequence
12	The code is an example of: `count += 1`	a. Cascaded assignment b. Augmented assignment c. Formatted output d. Feedback loop
13	What is printed by the following code?	a. 4 b. 8 c. 2 d. 3

	``` count = 3 count += 1 count *= 2 print(count) ```	
14	What powers are used to rotate the CodeBot clockwise?	a. LEFT and RIGHT are both negative b. LEFT is negative and RIGHT is positive c. LEFT is positive and RIGHT is negative d. Both positive, but LEFT is more than RIGHT
15	In the feedback loop for cruise control, the feedback comes from:	a. The wheels b. The motors c. The wheel encoders d. Line sensors
16	What does this code do? ``` axis = math.asin(val / ONE_G) ```	a. Calculates the acceleration of the CodeBot b. Converts the acceleration to degrees c. Converts the acceleration to radians d. Converts radians to degrees
17	What does this code do? ``` cm * (COUNTS_PER_REV / WHEEL_CIRC_CM) ```	a. Converts counts to centimeters b. Converts centimeters to counts c. Calculates the track circumference d. Calculates the speed

18	What does this code do?
	``
	was_slot = False
	val = enc.read(LEFT)
	is_slot = val > SLOT_THRESHOLD
	if is_slot != was_slot:
	    count += 1
	    was_slot = is_slot
	``
		a. Reads the encoder everytime there is a new slot
		b. When a new slot is found, it increments the counter
		c. When a reading is different, it increments count and flips is_slot
		d. When the reading is the same, it increments count and flips is_slot

19	How much time passes before the loop breaks?
	``
	tm = ticks_ms() + 500
	while True:
	    if ticks_ms() > tm:
	        break
	``
		a. 1 second
		b. ½ second
		c. 1 millisecond
		d. 5 milliseconds

20	What does this code do? ``` err = target_speed - cur_speed power += err * Kp motors.run(LEFT, power) motors.run(RIGHT, power) ```	a. Causes the CodeBot to brake b. Causes the CodeBot to move forward c. Calculates the speed for CodeBot d. Provides constant feedback when in a loop

Unit 5 Exam Questions (in Microsoft Forms)

1	What value is returned by the wheel encoder?	a. An integer from 0 to 4095 b. Integers from -32767 to 32768 c. Floats from -32767 to 32768 d. Boolean values True or False

2	What type of values does an accelerometer return?	a. A Boolean: True or False b. An integer from -32767 to +32768 c. A float from -32767 to +32768 d. An integer from 0 to 4095
3	What is the value of **number**? `number = round(4.85)`	a. 4 b. 4.85 c. 5 d. .85
4	Which expression is **False**?	a. abs(-5) / abs(5) == 1 b. abs(-5) / -5 == 1 c. -5 / abs(-5) == -1 d. 5 / abs(-5) == 1
5	Given this code, what does the \x mean? `"90\xB0"`	a. Escape sequence is a decimal number b. Escape sequence is a binary number c. Escape sequence is a hexadecimal number d. \x is printed on the console

6	What will print when the code runs?
	`my_text = '#' * 5`
	`print(my_text)`
		a. # * 5
		b. 55555
		c. 5 will print with center alignment
		d. #####

7	What will print when the code runs? `print(f'{math.pi:.3f}')`	a. 3.14 b. 03.1 c. 3.142 d. 3.14 will print with center alignment
8	What will print when the code runs? `print("{:>15}".format('Python'))`	a. Python will print with left alignment b. Python will print with right alignment c. Python will print with center alignment d. An error will occur
9	The print statement includes an example of: `print("90\xB0")`	a. Format specifier b. Formatted string c. Escape sequence d. Cascaded assignment
10	This code is an example of: `first = last = ''`	a. Augmented assignment b. Cascaded assignment c. List comprehension d. Escape sequence
11	This code is an example of: `ind += 1`	a. Augmented assignment b. Cascaded assignment c. List comprehension d. Escape sequence

12	What is printed when the code runs?
	`ind = 5`
	`ind += 1`
	`ind *= 2`
	`ind += 1`
	`print(ind)`
		a. 6
		b. 12
		c. 13
		d. 14

13	What powers are used to rotate the CodeBot counterclockwise?	a. LEFT and RIGHT are both negative b. LEFT is negative and RIGHT is positive c. LEFT is positive and RIGHT is negative d. Both positive, but LEFT is more than RIGHT
14	In the feedback loop for cruise control, the feedback comes from:	a. The wheels b. The motors c. Line sensors d. The wheel encoders
15	What does this code do? `axis = math.asin(val / ONE_G)`	a. Calculates the acceleration of the CodeBot b. Converts radians to degrees c. Converts the acceleration to degrees d. Converts the acceleration to radians
16	What does this code do? `counts * WHEEL_CIRC_CM / COUNTS_PER_REV`	a. Calculates the speed using a wheel encoder b. Calculates the distance using a wheel encoder c. Converts counts to centimeters d. Converts centimeters to counts
17	What does this code do? `cm * (COUNTS_PER_REV / WHEEL_CIRC_CM)`	a. Converts counts to centimeters b. Converts centimeters to counts c. Calculates the track circumference d. Calculates the speed

18	What does this code do?
	`was_slot = False`
	`val = enc.read(LEFT)`
	`is_slot = val > SLOT_THRESHOLD`
	`if is_slot != was_slot:`
	`  count += 1`
	`  was_slot = is_slot`
		a. When a reading is different, it increments count and flips is_slot
		b. When the reading is the same, it increments count and flips is_slot
		c. Reads the encoder everytime there is a new slot
		d. When a new slot is found, it increments the counter

19	How much time passes before the loop breaks?
	`tm = ticks_ms() + 250`
	`while True:`
	`  if tick_ms() > tm:`
	`  break`
		a. ½ second
		b. ¼ second
		c. 25 seconds
		d. 25 milliseconds

20	What does this code do?
	`err = target_speed - cur_speed`
	`power += err * Kp`
	`motors.run(LEFT, power)`
	`motors.run(RIGHT, power)`
		a. Causes the CodeBot to brake
		b. Calculates the speed for CodeBot
		c. Provides constant feedback when in a loop
		d. Causes the CodeBot to move forward