

 Congratulations! You passed!

TO PASS 70% or higher

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GRADE
96.15%

Practice Full Assessment

TOTAL POINTS 26

1. True or False - the following scenario depicts an independent relationship between variables (tree growth and air quality): 20% of trees growing in a particular region are not growing to their expected height. In a particular neighborhood in that region, the Air Quality Index is labeled as "Unhealthy for Sensitive Groups" or worse 30% of the time. 10% of the trees in the region grow in this neighborhood. If you randomly measured the growth of a tree in that neighborhood, then the probability that that tree is not growing to its expected height is 33.33%.

True

False

 Correct

Topic to review: Conditional probability for independent events

1 / 1 point

2. A research group is curious about features that can be attributed to music genres. A music streaming service provides a few different attributes for songs such as speechiness, danceability, and valence. They suspect that there is a difference between the average valence (positive or negative emotion) of metal songs compared to blues songs. However, they must conduct a study to determine if that is true. From a sample of 87 metal songs, the sample mean for valence is 0.451 and the sample standard deviation is 0.139. From a sample of 94 blues songs, the sample mean for valence is 0.581 and the sample standard deviation is 0.167.

Assume that sample1 comes from the sample metal songs and that sample2 comes from the sample blues songs

Compute the 90% confidence interval. Please round the values to the fourth decimal point and format your response as follows: (lower_value, upper_value)

(-0.1679, -0.0921)

 Correct

Topics to review: confidence intervals, population means

1 / 1 point

3. Construct the least squares regression line based in the following output:

2 / 2 points

Call:

lm(formula = egg_production ~ age, data = chickendata)

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 3.24521 .981048 0.342 0.831

age -0.34231 0.03453 2.874 0.0020 **

Signif. codes: 0 *** 0.001 ** 0.01 * 0.05 . 0.1 ' 1

Correlation Matrix:

	egg_production	age
egg_production	1.0000000	0.6213532
age	0.6213532	1.0000000

Please, structure your response as $y = _ + _x$ so, for example, if the value of b0 was 1.301 and the value of b1 was 0.422, then your answer would be: $y = 1.301 + 0.422x$. Please round to the third decimal place.

y = 3.245 - 0.342x

 Correct

Topics to review for this question: linear regression, least squares regression line

4. Select the correct p-values that match the statements. Some conclusions may be applicable to more than one p-value.

2 / 2 points

Evidence against the null hypothesis is significant at the 1% level.

0.0949

0.0621

0.0021

0.0037

Correct

This is below 0.01, so if alpha is set to 1%, then we would consider the evidence to be significant.

0.0209

5. A tree farming company is testing how many items customers purchase during their visits. Based on many results, the probability distribution below was determined for the discrete random variable $X = \text{number of pieces of information remembered (during a fixed time period)}$.

2 / 2 points

X = # items	1	2	3	4	5	6
Probability	0.58	0.18	0.10	0.07	0.05	0.02

Complete the table below to provide the cumulative distribution function of X.

Please format your response in the following way:

(val_one, val_two, val_three, val_four, val_five, val_six)

Note that for each value, you should report the number to the second decimal place.

X = # items	1	2	3	4	5	6
Probability						

(0.58, 0.76, 0.86, 0.93, 0.98, 1.00)

Correct

Topic to review: CDF (Cumulative Distribution Function)

Also remember to follow the formatting, as this is not hand graded.

6. A research group is curious about features that can be attributed to music genres. A music streaming service provides a few different attributes for songs such as speechiness, danceability, and valence. They suspect that there is a difference between the average valence (positive or negative emotion) of metal songs compared to blues songs. However, they must conduct a study to determine if that is true. From a sample of 87 metal songs, the sample mean for valence is 0.451 and the sample standard deviation is 0.139. From a sample of 94 blues songs, the sample mean for valence is 0.581 and the sample standard deviation is 0.167.

1 / 1 point

Assume that sample1 comes from the sample metal songs and that sample2 comes from the sample blues songs.

Which of the following represents the hypotheses that we will be testing, assuming that μ_1 represents the population mean of valence for all metal songs and that μ_2 represents the population mean of valence for all blues songs.

- H₀: $\mu_1 = \mu_2$ versus H_a: $\mu_1 > \mu_2$
- H₀: $\mu_1 = \mu_2$ versus H_a: $\mu_1 < \mu_2$
- H₀: $\mu_1 = \mu_2$ versus H_a: $\mu_1 \neq \mu_2$

Correct

Consider what you're testing: is it that μ_1 is greater than, less than, or just different from μ_2 but not in a particular direction?

7. A survey was sent out to re-evaluate the proportion of people who play games on pc computers, as the last study on the topic had been gathered four years prior. This survey was done specifically to test the possibility that fewer people are playing games on pc computers. The previous study found that 81% of people were playing games on pc computers. The current study, with 861 participants, found that 53% of people who responded play on a pc computer.

1 / 1 point

Calculate the p-value and determine if we should **accept** or **reject** H₀ under alpha = 0.05.

reject

Correct

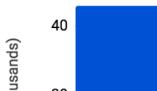
Topics to review: testing a hypothesis, calculating the p-value, interpreting the p-value, Type I and Type II errors.

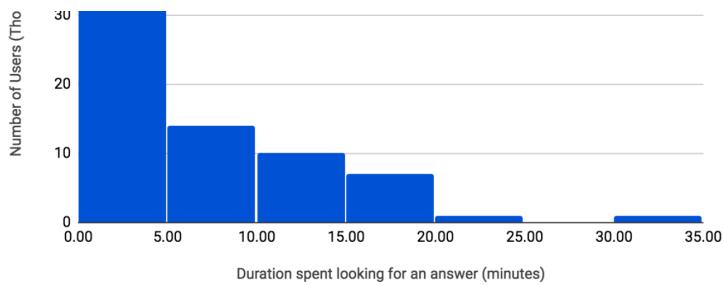
8. Which of the following graphs match the following distribution description?

1 / 1 point

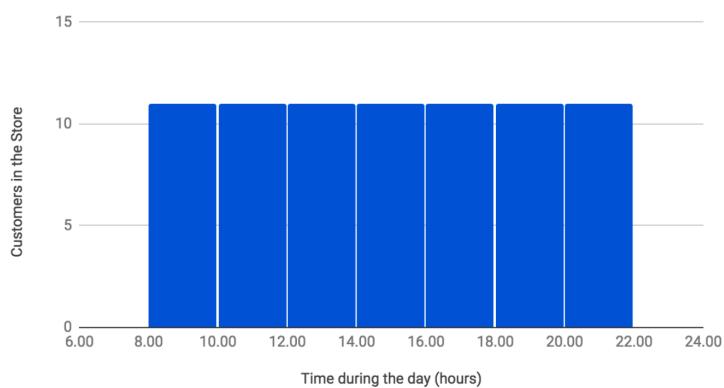
uniform, symmetrical, no apparent outliers

50

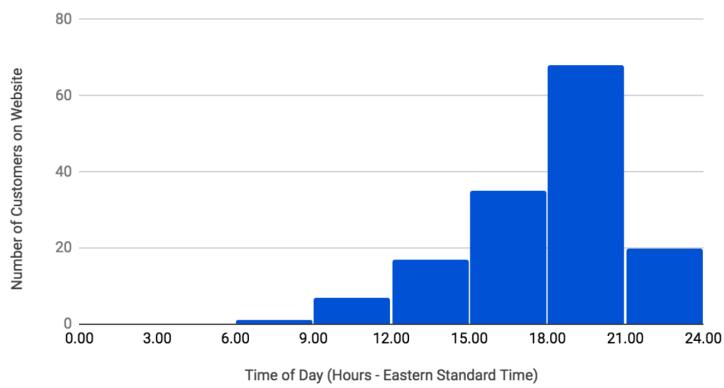




- 0-5 minutes, 43 people
- 5-10 minutes, 14 people
- 10-15 minutes, 10 people
- 15-20 minutes, 7 people
- 20-25 minutes, 1 people
- 25-30 minutes, 0 people
- 30-35 minutes, 1 people

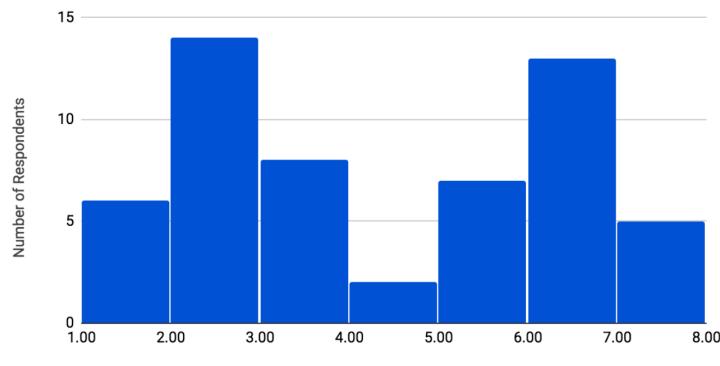


- 6-8 hours, 0 customers
- 8-10 hours, 11 customers
- 10-12 hours, 11 customers
- 12-14 hours, 11 customers
- 14-16 hours, 11 customers
- 16-18 hours, 11 customers
- 18-20 hours, 11 customers
- 20-22 hours, 11 customers
- 22-24 hours, 0 customers



- 0-3 o'clock, 0 customer

- 3-6 o'clock, 0 customer
- 6-9 o'clock, 1 customer
- 9-12 o'clock, 7 customers
- 12-15 o'clock, 17 customers
- 15-18 o'clock, 35 customers
- 18-21 o'clock, 68 customers
- 21-24 o'clock, 20 customers



Feelings towards Hawaiian Pizza (1 - Highly unsatisfactory, 7 - Highly satisfactory)

A histogram describes the distribution of respondents' satisfaction level towards Hawaiian pizza. The horizontal x-axis shows respondents' feelings, ranging from 1 to 7, 1 means highly unsatisfactory, 7 means highly satisfactory, each bin representing a 1 satisfactory level. The vertical y-axis shows the number of respondents, ranging from 0 to 15, in increments of 5. Data in the histogram can be summarized accurately as:

- 6 respondents voted for level 1
- 14 respondents voted for level 2
- 8 respondents voted for level 3
- 2 respondents voted for level 4
- 7 respondents voted for level 5
- 13 respondents voted for level 6
- 5 respondents voted for level 7

Correct

Topic to review: distributions, histograms, interpreting graphs and diagrams

9. When testing whether the means of more than two populations are equal, which test would we use?

1 / 1 point

- ANOVA
- CHI-Square
- T-test
- F-test

Correct

Topics to review: Situations for different types of tests - ANOVA, CHI-Square, Population Proportion, Population Mean, Two Population Proportions, Two Population Means, Regression

10. The length of a movie falls on a normal distribution. About 95% of movies fall between 75 minutes and 163 minutes.

1 / 1 point

Suppose you watched a movie that was 182 minutes long. How many standard deviations is that movie from the mean? Please round to the second decimal point.

2.81

Correct

Key topics to review for this question: distribution, standard deviation

11. Which of the following list comprehensions will extract all tuples in `words` that have origins that are Greek? Select as many as apply.

2 / 2 points

```

1 words= [("time", ("Noun"), ("Middle English")),
2     ("take", ("Verb"), ("Gothic")),
3     ("people", ("Noun"), ("Latin")),
4     ("think", ("Verb", "Adjective"), ("Gothic")),
5     ("work", ("Noun", "Verb", "Adjective"), ("Greek", "Gothic")),
6     ("company", ("Noun"), ("Late Latin")),
7     ("problem", ("Noun", "Adjective"), ("Greek")),
8     ("feel", ("Verb", "Noun"), ("Old Norse")),
9     ("public", ("Adjective", "Noun"), ("Latin")),
10    ("sharpen", ("Noun", "Verb"))

```

```

11     ("annul", ("Verb"), ("Latin")),
12     ("cacophony", ("Noun"), ("Greek")),
13     ("grovel", ("Verb"), ("Old Norse")),
14     ("muse" , ("Noun", "Verb"), ("Greek", "Middle French")),
15     ("sublime", ("Adjective", "Noun", "Verb"), ("Latin")),
16     ("villify", ("Verb"), ("Late Latin")),
17     ("diffuse", ("Verb", "Adjective"), ("Latin")),
18     ("elucidate", ("Verb"), ("Late Latin")),
19     ("flout", ("Verb", "Noun"), ("Middle English")),
20     ("grouse", ("Verb", "Noun"), ("?")),
21     ("limpid", ("Adjective"), ("Latin")),
22     ("nexus", ("Noun"), ("Latin")),
23     ("quibble", ("Verb", "Noun"), ("?")),
24     ("verbose", ("Adjective"), ("Latin")),
25     ("catalyst", ("Noun"), ("?")),
26     ("nocturnal", ("Adjective"), ("Late Latin")),
27     ("diurnal", ("Adjective", "Noun"), ("Latin")),
28     ("malapropism", ("Noun"), ("English")))

```

greek_origins = [data for data in words if data[2] in "Greek"]

greek_origins = [data for data in words if "Greek" in data[-1]]

Correct

topics to review: list comprehensions, extracting data from tuples, conditionals

greek_origins = [data for data in words if data[-1] == "Greek"]

greek_origins = [data for data in words if "Greek" in data[2]]

Correct

topics to review: list comprehensions, extracting data from tuples, conditionals

12. Which of the following lines of code will sort the list of dictionaries called `state_econ` by the values stored in the key called "low_ses_prcnt" from smallest to largest value? Select as many as apply.

1 / 1 point

sorted(state_econ, key = lambda k: state_econ["low_ses_prcnt"], reverse = False)

sorted(state_econ, key = lambda k: k["low_ses_prcnt"])

Correct

Topics to review: sorting, nested data, dictionaries, optional parameters, key parameter for sorting, reverse parameter for sorting, lambda functions

sorted(state_econ, key = lambda k: k["low_ses_prcnt"], reverse = False)

Correct

Topics to review: sorting, nested data, dictionaries, optional parameters, key parameter for sorting, reverse parameter for sorting, lambda functions

sorted(state_econ, key = lambda k: k["low_ses_prcnt"], reverse = True)

sorted(state_econ, key = lambda k: state_econ[k]["low_ses_prcnt"])

13. Assume that a json-structured string has been stored in a file named "retrieved_data.json". Which solution would read in the data and convert it to a python object? json has been imported in each case. Select all that apply

2 / 2 points

```

1  f = open("retrieved_data.json", "r")
2  p_object = json.loads(f.readlines())
3  f.close()
```

```

1  f = open("retrieved_data.json").readlines()
2  p_object = json.loads(f)
3  f.close()
```

```

1  f = open("retrieved_data.json")
2  f_string = f.read()
3  p_object = f_string.json()
4  f.close()
```

```

1  f = open("retrieved_data.json").read()
2  p_object = json.loads(f)
3  f.close()
```

Correct

Topics to review: reading from files, json

```
 1 f = open("retrieved_data.json", "r")
2 f_string = f.read()
3 p_object = json.dumps(f_string)
4 f.close()
```

14. Which of the following while loops has an infinite loop? Select as many as apply.

1 / 1 point

```
 1 q = ""
2 words = []
3 while q != "stop":
4     q = input("Please enter a word: ")
5     words.append(q)
```

```
 1 y = True
2 t = 13
3 while y:
4     if t <= 12:
5         y = False
6     t = t-1
```

```
 1 while True:
2     x = 8
3     if x > 10:
4         print(x)
5     x += 1
```

✓ Correct

Topics to review: while loops, infinite loops, conditionals, break

```
 1 x = 20
2 while True:
3     x += 2
4     if x <= 20:
5         break
```

✓ Correct

Topics to review: while loops, infinite loops, conditionals, break

15. Assume that you are creating a function that is working on a list of dictionaries. Each dictionary stores data about different interest groups. In each dictionary is a key called "questions_req" which has the value of True or False, depending on whether the group requires people to answer questions before they can join. Which of the following functions would create a list of groups that require someone to answer questions before they can join?

1 / 1 point

```
 1 def req_questions(data):
2     requires = []
3     for group in data:
4         if group["questions_req"] == True:
5             requires += group
6     return requires
```

```
 1 def req_questions(data):
2     return [group for group in data if group["questions_req"] == False]
```

```
 1 def req_questions(data):
2     requires = []
3     for group in data:
4         if group("questions_req") == True:
5             requires.append(group)
6     return requires
```

```
 1 def req_questions(data):
2     requires = []
3     for group in data:
4         if group["questions_req"]:
5             requires.append(group)
6     return requires
```

✓ Correct

Topics to review: function definition, for loops, conditionals, booleans, nested data, dictionaries, lists, return statements

16. Provide the line that would serve as the function definition for the method add_department within the School Class:

```

1  class School():
2
3      def __init__(self, name, num_students, departments = []):
4          self.name = name
5          self.student_population = num_students
6          self.number_departments = len(departments)
7          self.departments = departments
8
9      # Below will be the method definition for a method called add_department.
10     # This method will take a string as input, called new_dept, which will be added to
11     # the instance variable self.departments.
12     # Your task for this prompt is to write the method definition.
13
14     """your code will be inserted here"""
15     |   self.number_departments += 1
16
17     def graduate(self, class_size):
18         self.student_population = self.student_population - class_size
19
20     def add_students(self, class_size):
21         self.student_population += class_size

```

```
def add_department(self.departments, new_dept):
```



Topics to review: Classes, class methods, function definitions, parameters

Remember, when you create a class method you must always use self (or whatever keyword you use in the __init__ method of the class definition) as the first parameter, regardless of how many parameters you set up for the method.

17. What is printed when the following code is executed?

```

1  def winner(winning_number, guess):
2      try:
3          if float(guess) < float(winning_number):
4              return "Sorry, your guess is lower."
5          elif float(guess) > float(winning_number):
6              return "Sorry, your guess is higher."
7          return "Yes, that is correct!"
8      except:
9          return "Sorry, please enter a digit."
10
11 print(winner(23, 1))
12 print(winner(52, 54))
13 print(winner("eight", "eight"))

```

Sorry, your guess is higher.

Sorry, your guess is lower.

Sorry, please enter a digit!

Sorry, your guess is lower.

Sorry, your guess is higher.

Sorry, please enter a digit!

Sorry, your guess is lower.

Sorry, your guess is higher.

Yes, that is correct!

Sorry, your guess is higher.

Sorry, your guess is lower.

Yes, that is correct!



Topics to review: function definition, conditionals, try/except, return statements

18. Assume that a json-structured string has been stored in a file named "improv_data.json". Fill in the blank to convert the json string into a python object and store it in the variable improv_py.

```

1  import json
2  improv_f = open("improv_data.json", "r").read()
3  improv_py = # your code would finish this statement
4  improv_f.close()

```

```
json.loads(improv_f)
```

 **Correct**

For this problem, it would take the string assigned to `improv_f` and use `json.loads` to load the string into a python object.

Topics to review: json, reading from files

19. [Practice Jupyter Notebook] How many lines are in the file `list_of_books.txt`?

1 / 1 point

5

 **Correct**

This is correct. To determine this, you could count the number of `\n` that appear in the file, check the length of the list produced by `readlines`, or count the number of times that the for loop iterates through the file.

20. [Practice Jupyter Notebook] What is the output if you print the following code: `hatcher.can_check_out(Book('How to Lie with Statistics', 'Darrell Huff'))`

1 / 1 point

Please copy it here from the output.

True

 **Correct**

This is correct. Because there is 1 or more copies of "How to Lie with Statistics" available, the output should be True.