

Exam 2 Version Y

■ Question 1

■ [1 points] Assume element is a Selenium WebElement given by `page<\a>`. Which of the following returns "link.html"?

- `element.href`
- `element.text`
- `element.get_attribute("href")`
- `element.get_attribute("text")`

■ Question 2

■ [1 points] Suppose element is an HTML table WebElement with 3 rows and 3 columns, which of the following code finds the text in the last cell of the first row in the table?

- `element.find_elements("tag name", "tr")[2].find_elements("tag name", "td")[2].text`
- `element.find_element("tag name", "tr").find_element("tag name", "td").text`
- `element.find_element("tag name", "tr").find_elements("tag name", "td")[2].text`
- `element.find_elements("tag name", "tr")[2].find_element("tag name", "td").text`

Question 3

[1 points] Suppose the following nodes are in the priority queue, {node: "A", g: 1, h: 10}, {node: "B", g: 3, h: 7}, {node: "C", g: 5, h: 3}, {node: "D", g: 7, h: 2}, where "g" represents the distance from the initial node and "h" represents an admissible heuristic (estimated distance to the goal node). Which node will best first greedy search check next?

"C"

"B"

"A"

"D"

Question 4

[1 points] There are infinite number of web pages labeled by $(0, 0)$, $(0, 1)$, $(0, 2)$, ..., $(1, 0)$, $(1, 1)$, ... and page (i, j) contains links to pages $(i + 1, j)$ and $(i, j + 1)$. Suppose we start at page $(0, 0)$ and the goal is to find page $(10, 10)$, which one of the following search heuristic is NOT admissible?

$h((i, j)) = |10 - i| + |10 - j|$

$h((i, j)) = 1$

$h((i, j)) = \min(|10 - i|, |10 - j|)$

$h((i, j)) = 0$

Question 5

[1 points] Which of the following is a correct query string for route data that produces `dict(flask.request.args) = {"from": "B", "to": "A"}`

- IP:5000/data?from=B,to=A
- IP:5000/data?from=B&to=A
- IP:5000/data?from="B",to="A"
- IP:5000/data?from="B"&to="A"

Question 6

[1 points] What URL should be visited to get the page that displays "bbb"?

```
@app.route("/aaa")
def aaa():
    return "bbb"
```

```
@app.route("/")
def bbb():
    return "aaa"
```

- http://127.0.0.1:5000/
- http://127.0.0.1:5000/bbb
- http://127.0.0.1:5000/aaa
- http://127.0.0.1:5000/index

■ Question 7

■ [1 points] Which of the following types of visitor information can be found based on `flask.request.remote_addr`?

- Browser information
- Device information
- Location information
- Operating system

■ Question 8

■ [1 points] In a Flask app, `app.route("/index/<x>")` binds the function `index(x)` return `x`. What will visits to `"/index/1?x=2"` display?

- 2
- (Error)
- (Status Code 404)
- 1



■ Question 9

■ [1 points] Suppose the total number of visits to version A and version B pages are fixed, say at 100 and 100. Which of the following will result in the smallest p-value for an A/B test?

- 25 clicks on A, 75 clicks on B
- 0 clicks on A, 50 clicks on B
- 50 clicks on A, 50 clicks on B
- 100 clicks on A, 0 clicks on B

■ Question 10

■ [1 points] When analyzing three contingency tables from an A/B test, `scipy.stats.fisher_exact(df)` returns 0.002 for table 1, 0.02 for table 2, and 0.2 for table 3. At a threshold for significance of 10 percent, for how many tests do we have statistically significant evidence that B has a different click-through-rate than A?

- 3
- 2
- 1
- 0



■ Question 11

■ [1 points] If the current average click through rates from versions A, B, C of the page are the same, and the numbers of visits to A, B, C are 30, 20, 10, respectively, which version with the UCB1 (upper confidence bound) algorithm display next?

A

A, B, C with equal probability

Depends on the variance

C

■ Question 12

■ [1 points] How many of the following visual encodings are more suitable for categorical data columns over ordinal data columns: (1) size, (2) shape (style), (3) color value (lightness or brightness), (4) color hue, (5) texture (different patterns inside a shape).

4

3

1

2

■ Question 13

■ [1 points] In a DataFrame with columns c1, c2, c3, c4 containing categorical data with 5, 4, 3, 2 categories respectively, how many subplots (axes) will `seaborn.relplot(data, x = "c1", y = "c2", col= "c3", row = "c4")` make?

- 1
- 6
- 12
- 20

■ Question 14

■ [1 points] Which of the following transform will give you the circle that looks the smallest on the screen?

```
fig, ax = plt.subplots()
ax.set_xlim(0, 2)
ax.set_ylim(0, 2)
circle = plt.Circle((0.5, 0.5), 0.5, transform = ??)
??.add_artist(circle)
```

- `fig.transFigure`
- (two of the choices have the same smallest size)
- `ax.transAxes`
- `ax.transData`

■ Question 15

■ [1 points] If the quadratic Bezeir curve `matplotlib.patches.FancyArrowPatch((10, 10), (0, 0), connectionstyle=ConnectionStyle.Angle3(-45, 0))` has three control points $(10, 10)$, (a, b) , $(0, 0)$, what is the value of (a, b) ?

- $(0, 10)$
- $(20, 0)$
- $(0, 20)$
- $(10, 0)$

■ Question 16

■ [1 points] Which of the following does NOT produce a square if `x = shapely.geometry.box(0, 0, 4, 4)`, `y = shapely.geometry.box(1, 1, 3, 3)`?

- `x.intersection(y)`
- (All other choices produce a square)
- `x.union(y)`
- `x.convex_hull`

■ Question 17

■ [1 points] If $x = \text{shapely.box}(0, 0, 1, 1)$ and $y = \text{shapely.box}(a, b, c, d)$ for some $a < c$, $b < d$, $z = x.\text{union}(y)$, what is the minimum number of vertices the polygon z will have?

8

4

1

6

■ Question 18

■ [1 points] What will be `len(matches)` given the code below? (Note there is no space between CS and 320)

```
courses = "CS320, CS 368, CS 540, CS 559"  
matches = re.findall("[A-Z]+\s(\d{3})", courses)
```

0

1

3

2

■ Question 19

■ [1 points] What does this line output `re.sub(r"(((\d)\d)\d)", "\g<3>\g<2>\g<1>", "320 123")`?

"320323 123121"

"332320 112123"

"320 123 32 12 3 1"

"023 321"

■ Question 20

■ [1 points] If you think any of the questions are not clear or incorrect, please explain here; otherwise, enter "none". Please do not leave the answer blank:

■ END OF EXAM

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