CS303E Week 11 Worksheet: Tuples, Sets and Dictionaries

Name: _____ EID: _____

Read the questions carefully, and answer each question in the space provided. Use scratch paper to do your work and then copy your answers neatly and legibly onto the test paper. Only answers recorded on the test paper will be graded.

1. (10 points: 1 point each) The following are true/false questions. **Write either T or F in the boxes at the bottom of page 1.** If there's any counterexample, it's false.

   (a) If a list in Python contains multiple identical items and you try to convert it to a set, the program will crash.

   (b) If you try to access a dictionary element with `D[k]` but `k` is not a key in the dictionary, Python will return `None`.

   (c) The expression {} denotes an empty set in Python.

   (d) The dictionary comprehension {`str(x):0 for x in range(1, 6)`} is equivalent to the dictionary {`"1":0, "2":0, "3":0, "4":0, "5":0`}.

   (e) The `in` operator can be used to check for the presence of an element in a tuple, but it doesn't work on sets because sets have no order.

   (f) The `.pop()` method for dictionaries in Python removes the last added key-value pair of the dictionary and returns it.

   (g) When iterating over a dictionary using a `for` loop, the loop variable refers to the keys of the dictionary.

   (h) You can loop over sets, but you cannot loop over tuples.

   (i) Assuming `s1` and `s2` are both sets, the expression `s1.difference(s2)` can return a different result from `s2.difference(s1)`.

   (j) Both lists and tuples in Python support adding elements after creation, but unlike lists, elements in a tuple cannot be changed once added.

a	b	c	d	e	f	g	h	i	j

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Questions 2-8 are multiple choice. Each counts 2 points. **Write the letter of the BEST answer in the box on page 4. Please write your answer in UPPERCASE. Each problem has a single answer.**

2. Which of the following is a valid way to create a tuple containing the integer `1`?

   A. `harry = 1,`

   B. `liam = (1,)`

   C. `niall = (1)`

   D. `louis = {1,}`

   E. All of the above.

   F. A and B

3. Which approach will correctly delete key/value pairs from a dictionary (`myDict`) where the value is less than some threshold `x`?

   A.
   ```
   for value in myDict:
       if not value >= x:
           del value
   ```

   B.
   ```
   myKeys = list(myDict.keys())
   for key in myKeys:
       if myDict[key] < x:
           del myDict[key]
   ```

   C.
   ```
   for i in range(len(myDict)):
       if myDict[i] < x:
           myDict.pop(i)
   ```

   D.
   ```
   removeKeys = [val for key, val in myDict.items() if val < x]
   for key in removeKeys:
       del myDict[key]
   ```

4. If `s1` and `s2` are both sets, and `s1.issuperset(s2)` is `False`, which of the following expressions will always evaluate to `True`?

   A. `s1.difference(s2) == s1`

   B. `s1.symmetric_difference(s2) != set()`

   C. `s1.intersection(s2) == set()`

   D. `len(s2) >= len(s1)`

5. What can the `tuple()` constructor be used for?

   A. Creating an empty tuple.
   B. Converting a single number into a one-item tuple.
   C. Converting other types such as strings or lists to tuples.
   D. All of the above.
   E. A and C.

6. What is possible output of the following code?

```
pleakley = {"lilo", "stitch"}
jumba = pleakley
jumba.add("nani")
bubbles = set(pleakley)
bubbles.remove("stitch")
print(pleakley, jumba, bubbles)
```

   A. `{"nani", "stitch", "lilo"} {"nani", "stitch", "lilo"} {"nani", "lilo"}`
   B. `{"stitch", "lilo"} {"nani", "stitch", "lilo"} {"lilo"}`
   C. `{"stitch", "lilo"} {"nani", "stitch", "lilo"} {"nani", "lilo"}`
   D. `{"nani", "stitch", "lilo"} {"nani", "stitch", "lilo"} {"lilo"}`
   E. None of the above.

7. Which of the following correctly demonstrates tuple unpacking in Python?

   A. `dreamland, eatsAlot = ("kirby", "dedede", "metaKnight")`
   B. `(arcanine, chansey) = "jigglypuff", "jynx", "clefairy"`
   C. `blathers, ableSisters = ("isabelle", "tomNook"), ("rover", "kkSlider")`
   D. `courage, (wisdom, power) = ("link", ("zelda", "ganon"))`
   E. C and D.
   F. B, C and D.

8. What happens when you try to add two dictionaries using the `+` operator?

   A. The dictionaries are merged, and if there are overlapping keys, the values from the second dictionary overwrite those from the first.

   B. The dictionaries are merged, and if there are overlapping keys, their values are summed.

   C. It creates a list containing both dictionaries as elements.

   D. It raises an error.

2	3	4	5	6	7	8

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The following questions (2 points each) ask you to trace the behavior of some Python code and identify the output of that code. For each question, write the output for the code segment in the box provided. Don't worry about line breaks. If there's an error, say so, but you don't need to specify the type of error.

9.
```
def avatar(krew):
    krew += ("tenzinAir", "bolinEarth", "makoFire")
    return krew

otp = ("korra", "asami")
avatar(otp)
for i in range(len(otp)):
    if i % 2:
        print(otp[i][:5], end = "")
    else:
        print(otp[i][:4], end = "")
```

10.
```
gaang = ("aang", "katara", "sokka")
gaang += ("toph", "zuko")
print(gaang, end = " ")
gaang -= ("zuko", "aang")
print(gaang, end = " ")
```

11.
```
marioKart = {"donkeyKong": "goodie", "wario": "baddie", \
             "luigi": "goodie", "bowser": "baddie"}
marioParty = {char: align for align, char in marioKart.items()}
print(marioParty)
```

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12.
```
teenTitans = {"robin", "starfire", "raven", "beastboy", "cyborg"}
girlsRule = {"starfire", "raven"}
boysDrool = {"robin", "beastboy", "cyborg"}

azarath = teenTitans.difference(boysDrool)
silkie = teenTitans.symmetric_difference(boysDrool)

if azarath == silkie:
    print(teenTitans.intersection(girlsRule))
else:
    print(boysDrool.union(girlsRule))
```

13.
```
monsterHigh = {"frankie", "draculaura", "clawdeen", "cleo"}
ghoulSpirit = {"frankie", "lagoona", "ghoulia", \
               "abbey", "spectra", "clawdeen"}
ghoulPower = monsterHigh.symmetric_difference(ghoulSpirit)
sixInchHeels = monsterHigh + ghoulSpirit.difference(monsterHigh)
print(ghoulPower == sixInchHeels)
```

14.
```
blastFromPast = ("nancyDrew", \
                 ["peppaPig", "goosebumps"], \
                 "junieBjones")
blastFromPast[1][0] = "magicSchoolBus"
print(blastFromPast)
```

15.
```
simba = (3, 7)
timon, pumbaa = simba
timon += 1; pumbaa += 1
simba += (2, 5)
print(timon, pumbaa, simba)
```

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16. (3 points)

```
spotifyPlaylist = {"partyInUSA": "miley", "hitMeBaby": "britney",
                   "want4Christmas": "mariah", "theClimb": "miley",
                   "obsessed": "mariah", "circus": "britney",
                   "singleLadies": "beyonce"}
print({spotifyPlaylist.pop(song) for song in list(spotifyPlaylist.keys())})
```

17.
```
mister = [3, 5, 2, 0, 3, 8, 1, 6, 9, 4, 2, 7, 3, 5, 9, 7]
taterTot = set()
for pumpkin in mister:
    if pumpkin % 3 == 0:
        taterTot.add(pumpkin)
    elif pumpkin % 2 == 0:
        taterTot.add(pumpkin // 2)
    else:
        taterTot = taterTot.difference({pumpkin // 2})
print(taterTot)
```

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