Northeastern University

CS 2100: Program Design and Implementation 1

Practice Quiz 2

Instructions

• Do not begin the quiz until instructed to do so.
• You may use both sides of a sheet of paper up to 8.5"x11" for reference, but no other resources, including phones, computers, AI, headphones, and ear pods.
• You have until the end of the class period to complete the quiz.
• Students may not leave the classroom during the first 10 minutes of the quiz (except in case of emergency).
• Hand your completed quiz to an instructor before leaving the room.
• Talk to an instructor if you need to leave the room and reenter.

Name: _____

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Name: _____

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Git

You are working on a CS 2100 homework assignment. You `git clone`d your assignment, wrote some good code, found yourself at a good stopping point, and decided to submit it. You haven't run any `git` commands since the `git clone`. You save your changes in VS Code, and then run these commands in the command line:

```
git commit -m "complete question 2"
git push
```

Your changes don't appear in GitHub or Pawtograder. Which `git` command was missing?

Solution

```
git add .
```

Functions and Documentation

Here is a function with most of its documentation. Part of the documentation is missing.

Please complete the documentation to match the code inside the function.

```python
def print_stars(n: int) -> None:
    """Prints a right-angled triangle of stars with 'n' rows

    Args:
        n (int): The number of rows in the triangle

    Returns:
        None




    """
    if n <= 0:
        raise ValueError("n must be a positive integer")
    for i in range(1, n + 1):
        print('*' * i)
```

Solution

```
    Raises:
        ValueError if n is negative
```

Classes: constructors, methods, and attributes

Read the `ProtectedPerson` class below.

Please write a `__str__()` function so that, if `person` is a variable of type `ProtectedPerson` and `person.name = "Blob"`, then `print(person)` returns:

- `Blob is unprotected` if Blob's bodyguard is `None`, and
- `<name> protects Blob`, where `<name>` is replaced by Blob's bodyguard's name, if they have one.

```python
class ProtectedPerson:
    """A class representing a person with a bodyguard"""
    def __init__(self, name: str, bodyguard: Optional[str]) -> None:
        self.name = name
        self.bodyguard = bodyguard

    def __str__(self) -> str:
```

Solution

```python
        if self.bodyguard is None:
            return f"{self.name} is unprotected"
        else:
            return f"{self.bodyguard} protects {self.name}"
```

Using objects

Using the `ProtectedPerson` class from the previous question, what is the output of this code?

```python
blob = ProtectedPerson("Blob", "Glob")
glob = ProtectedPerson("Glob", None)
print(glob)
```

Solution

```
Glob is unprotected
```

Name: _____

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Lists, sets, and dictionaries

Please fill in the code to match the documentation:

```python
def get_friends(name: str, enemies: dict[str, list[str]]) -> list[str]:
    """Returns a list of friends of the person with the given name.
    A friend is defined as an enemy of an enemy.
    For example, if A is an enemy of B, and B is an enemy of C,
    then A and C are friends.

    Args:
        name (str): The name of the person whose friends are to be found
        enemies (dict[str, list[str]]): A dictionary mapping person names
        to a list of their enemy names

    Returns:
        A list of names of friends. May contain repeated names.
    """
    if name not in enemies:
        return []



    for enemy_name in enemies[name]:
```

```python
enemies = {
    'Mini': ['Mega', 'Micro'],
    'Mega': ['Mini', 'Giga', 'Micro'],
    'Micro': ['Mini', 'Micro'], # Yes, Micro is Micro's own enemy
    'Giga': ['Mega']
}
```

Solution

```python
        friends: list[str] = []
        for friend_name in enemies[enemy_name]:
            friends.append(friend_name)
        return friends
```

Name: _____

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Correlation

A researcher finds a correlation coefficient of 0.92 between number of firefighters at a scene and property damage. Can we conclude that firefighters cause property damage? (Yes or no)

Solution

No (Justification, which is not required: Because a high correlation coefficient does not indicate causation. Property damage may be correlated with firefighters for other reasons.)

Stakeholder-value matrices

Consider an online shopping website where people can order clothing online to be shipped to them. Please fill in the cells in the bottom row of the following Stakeholder-value matrix, where the stakeholder is the shipping worker.

	Shipping distance	Physical safety
Customer	May want to reduce distance to minimize carbon footprint	May want to prevent their shipping address from being made available to others
Shipping worker		

Solution

Shipping distance: Likely wants to reduce time spent travelling Physical safety: Likely does not want to delivery to dangerous locations