Question 1.

The random variable X and Y have the following joint probability density

$$f_{XY}(x,y) = \begin{cases} e^{-x-y} & 0 < x < \infty, 0 < y < \infty \\ 0 & elsewhere \end{cases}$$

What is $P(X < Y)$?

Question 2.

Counting the pairs with k different from an integer list
eg: list = [1, 3,5] and k = 2
expected: we will have 2 pairs: {(1,3), (3,5)}
Note: we also consider the negative numbers.

Question 3.

Return the list of indices. The indices is a sublist points to the same person. The same persons means they have the same name or email or phone.
eg:

```
data = [
    ("username1","phone_number1", "email1"),
    ("usernameX","phone_number1", "emailX"),
    ("usernameZ","phone_numberZ", "email1Z"),
    ("usernameY","phone_numberY", "emailX"),
 ]
```

expected: [[0,1,3][2]]

Question 4.
Implement the Forward propagation & Backward propagation for a three layers Neural Network. X,W and b can be random.

Notes:

- **pls upload your code into Github and submit us the Github link.**
- **Constraints: You may only use Python**