DIGITAL TECHNOLOGY

Academic Year 2023-24
Prof. Barbara PERNICI

Exam 27/8/2024
Total time 1.30 h

Last name	
First name	
Matricola/Person code	
Signature	

Please remember that:
- *The exam is closed books.*
- *The use of watches, cellular phones or any other electronic devices during the exam is forbidden.*

It is necessary to answer at least partially all the questions for a positive evaluation.
Given answers should be explained, lists of bullet items are insufficient to answer a question.

Question 1 [11 points]

Illustrate the RFIDs technology and discuss how it can be used for object localization.

Question 2 [11 points]

Illustrate the relationship among ethical, social, political issues in an information society and the five moral dimensions presented in the course.

Question 3 [11 points]

Consider the following fragment of Python code:

```python
import pandas as pd

ll = [1, 2, 3, 4, 5]
mm = ['a', 'bb', 'ccc', 'dddd', 'eeeee']

rr = []

for ii in range(0, len(ll) + 1):
    dd = {'letter': mm[ii], 'index': ll[kk]}
    rr.append(dd)


def my_fun(aaa='abcd'):
    return len(aaa)


df = pd.DataFrame(rr)   # Write down which is the content of this dataframe at this
point

df['count'] = df['letter'].apply(my_fun)

ff = [0 if i % 2 == 0 else 1 for i in df['index']]

df['mask'] = ff
df['sum'] = df['index'] + df['count'] + df['mask']

print(df)   # Write down which is the content of this dataframe at this point
```

1. In the code there are two errors. Find them, correct them explaining why they are errors.

2. Explain step by step the workflow of this piece of Python code, writing down when requested the content of the dataframe (see comments on the code)

3. Which is the difference between a merge and a concat operation in pandas?