TDLOG – session 5
Graphical User Interface

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Upload your work to educnet on 1 November 2019 at the latest

During this session, we will enhance the game developed so far, by adding a Graphical User Interface. The students can actually extend their own programs, or the solution for the previous session available on educnet.

1 Installing Qt/PyQt

1.1 Using conda

The installation is performed by simply executing the following command in a shell :

```
conda install pyqt
```

1.2 Under Linux without conda (Debian/Ubuntu)

The installation is performed through the system package manager, by executing the following commands to install respectively Qt5 for *Python* 3 and QtDesigner :
— `apt-get install python3-pyqt5`
— `apt-get install qt5-designer`

1.3 Under macOS without conda

The installation process is somewhat involved, and quite long (several minutes) because numerous elements will be compiled. The easiest way to install the whole set of elements is to execute the following steps :

1. installation of Homebrew (http://brew.sh) through `ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"`

2. installation of *Python* 3 : `brew install python3`
3. installation of Qt : `brew install qt`
4. installation of SIP : `brew install sip --with-python3`
5. installation of PyQt : `brew install pyqt --with-python3`

<u>Beware :</u> pay attention to the instructions output by `brew` on the terminal. For instance, `brew` asks for a modification of the file named `.bash_profile` in order to add/update a definition of the `PYTHONPATH` variable.

2   GUI

Since we have all the base classes, we can now program an interface for the game, carefully isolating its *model*. Figure 1 shows the user interface :
— on the left, the game grid ;
— on the right, arrow buttons to move the current character, and a button to swicth to the next character (circling back to the first one when the last one is currently selected).

We suggest using the following classes in order to develop the interface :
— `QGridLayout` in order to align the element as a grid ;
— `QLabel` to display the grid elements, using the `setPixMap` method which takes as parameter an instance of the `QPixMap` class (whose constructor accepts the name of an image file) ;
— `QPushButton` for the arrow and charcter buttons ;
— `QMessageBox` to display the game over message.

An archive with image file is available on Edcunet.

3   Annex : PyQt Documentation

The official *Python* web site contains some information about PyQt, in particular :
— https://wiki.python.org/moin/PyQt
— https://wiki.python.org/moin/PyQt/SampleCode

A complete documentation, with the list of classes is available at the following addresses :
— https://www.riverbankcomputing.com/static/Docs/PyQt5/
— https://www.riverbankcomputing.com/static/Docs/PyQt5/sip-classes.html

Finally, a tutorial is available at the following address :
— http://zetcode.com/gui/pyqt5

FIGURE 1 – Suggested interface.