Intro To Python: Questions and Exercises

1) How many bits in a byte?   Ans: 8

2) Do the following number conversions between binary, hexadecimal and decimal:

Convert this binary number to decimal: 1101   Ans: 13
Convert this decimal number to binary: 37   Ans: 100101
Convert this hexadecimal number to decimal: FF   Ans: 255
Convert this decimal number to hexadecimal: 120   Ans: 78

3) Why should interactive GUI scripts also be executable from the command line?

Answer:
i) Functionality performed by GUI with varying inputs can be repeated automatically in a text-based script executed in command (or terminal) shell window. (i.e. batch script)
ii) As I software tools developer for visual effects, I usually implement functions that are executable from command-line first and then develop GUI wrapper code in separate module which imports original functions from separate module. This is good software development strategy.

The following quoted sections are from this wiki link:
https://en.m.wikipedia.org/wiki/Command-line_interface#Command-line_interpreter

'''
Today, many end users rarely, if ever, use command-line interfaces and instead rely upon graphical user interfaces and menu-driven interactions. However, many software developers, system administrators and advanced users still rely heavily on command-line interfaces to perform tasks more efficiently, configure their machine, or access programs and program features that are not available through a graphical interface.
…
Programs with command-line interfaces are generally easier to automate via scripting.
'''

4) Why should scripts containing functions and/or classes that are imported as modules also be executable from __main__ scope?

Answer: Even if the functions and classes are only used as imported modules, a __main__ scope can be useful for testing. Note that statements under statement:

```python
if __name__ == "__main__":
```

are only executed when script is run directly from python command. Statements at top-most level are executed regardless of whether script is imported as a module or executed from python command.

5) Describe the Maya reload function and why it is used?

Answer: The Maya reload function re-imports a module that has already been imported in current Maya session. Without this function it would be necessary to restart Maya while developing, changing and testing a Maya python script.

6) Python Exercise:
Using python lists and strings, demonstrate the difference between mutable and immutable data types.

Answer: Read document: ex_mutable_immutable.pdf

7) Maya Python Exercise:
Create a function that builds a list of tuples containing keyframe, value pairs from input node attribute.
Extra points for creating a function with node as input that first queries that node for keyed attributes, and then builds the list of tuples as described above. Function should return a dictionary with dictionary keys equal to node.attribute string.

Answer: Read script: key_value.py