Installation instructions for xkl on Linux

Note: The following instructions were written with reference to an Ubuntu Linux distribution, that uses the "apt" package manager.
Although the program will run on any Linux flavor, if the installation is carried out on a Linux distribution with a package manager different from apt some of the packets listed in the Prerequisites section below might have different names.

Prerequisites
The installation of xkl on Linux requires a few software packages/libraries to be installed using the apt package manager, by issuing the following commands in a terminal:

sudo apt-get update (only once at the beginning of the installation procedure)
sudo apt-get install <packagename> (once per package)

Here is the list of packages to be installed:
- o make
- o gcc
- o libxt-dev
- o libxmu-dev
- o libmotif-dev
- o sox

Please note that although the installation procedure was tested on multiple machines, you might have to install other packages not listed here on the specific machine used for the installation. If a package is missing, you will typically receive an error message at some point during compilation.
As an example, if the *libmotif-dev* package were not to be installed, the error would be

xinfo.h:25:19: fatal error: Xm/Xm.h: No such file or directory

If you run into a similar error, the package providing the missing files (in this case *Xm.h*) can be found in most cases by issuing in a terminal the command

dpkg –S Xm.h

or by searching on the web (in particular if you are using another package manager).

Installation procedure
- Download the code archive from the github repository at ***https://github.com/lucadn/xkl/***
- Unzip the source code archive, go into its *src/* subfolder, and copy the folder *xkl_linux/* in the desired folder, such as */usr/local/bin*. This will create a */usr/local/bin/xkl_linux* folder
- Open a Terminal window and move to */usr/local/bin/xkl_linux* with the command:
  cd /usr/local/bin/xkl_linux
- Execute the following commands:
  make clean
  make
- The executable, named *xkl-3.2*, will be placed in */usr/local/bin/xkl_linux/xkl*, and can be opened by issuing the commands
  cd /usr/local/bin/xkl_linux/xkl
  ./xkl-3.2

You can also open it by directly providing an input .wav file by typing (e.g. for the file *heavens.wav*, available in the ***WAVEFORMS*** subfolder)

```
./xkl-3.2 ../WAVEFORMS/heavens.wav
```

Notes and caveats

- The play function uses the ***sox*** tool and two scripts in the ***utils*** subfolder. This is transparent to the user, provided that the internal folder structure under ***xkl_linux*** is not changed.
- The record function also uses the ***sox*** tool and two scripts in the ***utils*** subfolder. When a recording is started, the user is required to provide a file name that is used to save the recorded waveform in the ***xkl*** folder using the Microsoft (MS) .wav format. A version of the waveform is also saved in the Klatt format with the same name extended with the suffix *_kl*, and automatically opened in ***xkl.***
- .wav files generated by most acquisition programs (e.g. Audacity) adopt MS headers, while xkl requires Klatt headers. MS .wav files can be converted by using the ***ms2kl*** program, that is generated during the compilation in the ***/usr/local/bin/xkl_linux/utils*** folder. Just copy the MS .wav file (e.g. ***test.wav***) in the ***utils*** folder, and in a shell window type the commands

  ```
  cd /usr/local/bin/xkl_3.2/utils
  ./ms2kl test.wav
  ```

  that will generate in the same folder a new .wav file named ***test_kl.wav*** that can be opened with xkl.

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