```
!pip install buildozer
    Collecting buildozer
      Downloading buildozer-1.2.0-py3-none-any.whl (77 kB)
                                          77 kB 3.2 MB/s
    Collecting virtualenv
      Downloading virtualenv-20.13.0-py2.py3-none-any.whl (6.5 MB)
                                           6.5 MB 11.1 MB/s
    Collecting sh
      Downloading sh-1.14.2-py2.py3-none-any.whl (40 kB)
                                          40 kB 4.5 MB/s
    Requirement already satisfied: pexpect in /usr/local/lib/python3.7/dist-packages (from buildoz
    Requirement already satisfied: ptyprocess>=0.5 in /usr/local/lib/python3.7/dist-packages (from
    Requirement already satisfied: importlib-metadata>=0.12 in /usr/local/lib/python3.7/dist-packa
    Requirement already satisfied: filelock<4,>=3.2 in /usr/local/lib/python3.7/dist-packages (fro
    Collecting platformdirs<3,>=2
      Downloading platformdirs-2.4.1-py3-none-any.whl (14 kB)
    Requirement already satisfied: six<2,>=1.9.0 in /usr/local/lib/python3.7/dist-packages (from v
    Collecting distlib<1,>=0.3.1
      Downloading distlib-0.3.4-py2.py3-none-any.whl (461 kB)
                                          461 kB 48.4 MB/s
    Requirement already satisfied: zipp>=0.5 in /usr/local/lib/python3.7/dist-packages (from impor
    Requirement already satisfied: typing-extensions>=3.6.4 in /usr/local/lib/python3.7/dist-packa
    Installing collected packages: platformdirs, distlib, virtualenv, sh, buildozer
    Successfully installed buildozer-1.2.0 distlib-0.3.4 platformdirs-2.4.1 sh-1.14.2 virtualenv-2
!pip install cython==0.29.19
    Collecting cython==0.29.19
       Downloading Cython-0.29.19-cp37-cp37m-manylinux1_x86_64.whl (2.0 MB)
                                           2.0 MB 5.5 MB/s
    Installing collected packages: cython
      Attempting uninstall: cython
         Found existing installation: Cython 0.29.26
         Uninstalling Cython-0.29.26:
           Successfully uninstalled Cython-0.29.26
    Successfully installed cython-0.29.19
!sudo apt-get install -y \
   python3-pip \
   build-essential \
   git \
   python3 \
   python3-dev \
   ffmpeg \
   libsdl2-dev \
   libsdl2-image-dev \
   libsdl2-mixer-dev \
   libsdl2-ttf-dev \
   libportmidi-dev \
   libswscale-dev \
   libavformat-dev \
   libavcodec-dev \
   zlib1g-dev
```

Reading package lists... Done

```
Building dependency tree
Reading state information... Done
build-essential is already the newest version (12.4ubuntu1).
zlib1g-dev is already the newest version (1:1.2.11.dfsg-0ubuntu2).
zlib1g-dev set to manually installed.
git is already the newest version (1:2.17.1-1ubuntu0.9).
python3 is already the newest version (3.6.7-1~18.04).
python3 set to manually installed.
python3-dev is already the newest version (3.6.7-1~18.04).
python3-dev set to manually installed.
ffmpeg is already the newest version (7:3.4.8-0ubuntu0.2).
libavcodec-dev is already the newest version (7:3.4.8-0ubuntu0.2).
libavcodec-dev set to manually installed.
libavformat-dev is already the newest version (7:3.4.8-0ubuntu0.2).
libavformat-dev set to manually installed.
libswscale-dev is already the newest version (7:3.4.8-0ubuntu0.2).
libswscale-dev set to manually installed.
The following additional packages will be installed:
  fluidr3mono-gm-soundfont gir1.2-ibus-1.0 libcapnp-0.6.1 libdbus-1-dev
  libfluidsynth1 libibus-1.0-5 libibus-1.0-dev libmad0 libmirclient-dev
  libmirclient9 libmircommon-dev libmircommon7 libmircookie-dev libmircookie2
  libmircore-dev libmircore1 libmirprotobuf3 libmodplug1 libportmidi0
  libprotobuf-dev libprotobuf-lite10 libpulse-dev libpulse-mainloop-glib0
  libsdl2-image-2.0-0 libsdl2-mixer-2.0-0 libsdl2-ttf-2.0-0 libsndio-dev
  libudev-dev libxcursor-dev libxinerama-dev libxkbcommon-dev libxrandr-dev
  libxv-dev python-pip-whl python3-asn1crypto python3-cffi-backend
  python3-crypto python3-cryptography python3-idna python3-keyring
  python3-keyrings.alt python3-pkg-resources python3-secretstorage
  python3-setuptools python3-six python3-wheel python3-xdg x11proto-randr-dev
  x11proto-xinerama-dev
Suggested packages:
  python-crypto-doc python-cryptography-doc python3-cryptography-vectors
  gnome-keyring libkf5wallet-bin gir1.2-gnomekeyring-1.0
  python-secretstorage-doc python-setuptools-doc
The following NEW packages will be installed:
  fluidr3mono-gm-soundfont gir1.2-ibus-1.0 libcapnp-0.6.1 libdbus-1-dev
  libfluidsynth1 libibus-1.0-5 libibus-1.0-dev libmad0 libmirclient-dev
  libmirclient9 libmircommon-dev libmircommon7 libmircookie-dev libmircookie2
  libmircore-dev libmircore1 libmirprotobuf3 libmodplug1 libportmidi-dev
  libportmidi0 libprotobuf-dev libprotobuf-lite10 libpulse-dev
  libpulse-mainloop-glib0 libsdl2-dev libsdl2-image-2.0-0 libsdl2-image-dev
  libsdl2-mixer-2.0-0 libsdl2-mixer-dev libsdl2-ttf-2.0-0 libsdl2-ttf-dev
  libsndio-dev libudev-dev libxcursor-dev libxinerama-dev libxkbcommon-dev
  libxrandr-dev libxv-dev python-pip-whl python3-asn1crypto
  python3-cffi-backend python3-crypto python3-cryptography python3-idna
  python3-keyring python3-keyrings.alt python3-pip python3-pkg-resources
  python3-secretstorage python3-setuptools python3-six python3-wheel
  python3-xdg x11proto-randr-dev x11proto-xinerama-dev
0 upgraded, 55 newly installed, 0 to remove and 37 not upgraded.
Need to get 26.1 MB of archives.
After this operation, 59.3 MB of additional disk space will be used.
Get:1 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic/universe amd64 fluidr3mono-gm-soundfont all 2
Get:2 http://archive.ubuntu.com/ubuntu bionic-updates/main amd64 libibus-1.0-5 amd64 1.5.17
Get:3 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic-updates/main amd64 gir1.2-ibus-1.0 amd64 1.5.
Get:4 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic/main amd64 libcapnp-0.6.1 amd64 0.6.1-1ubuntu
Get:5 http://archive.ubuntu.com/ubuntu bionic-updates/main amd64 libdbus-1-dev amd64 1.12.2
```

```
gstreamer1.0-plugins-base \
gstreamer1.0-plugins-good
 DETECTING PLEYTOUDLY WINDETCECON PROMUDE TENDETCOMORIES TO UNDERWINDER.
Preparing to unpack .../44-libgstreamer1.0-0-dbg_1.14.5-0ubuntu1~18.04.2_amd64.deb ...
Unpacking libgstreamer1.0-0-dbg:amd64 (1.14.5-0ubuntu1~18.04.2) ...
Setting up libpam-cap:amd64 (1:2.25-1.2) ...
 debconf: unable to initialize frontend: Dialog
 debconf: (No usable dialog-like program is installed, so the dialog based frontend cannot b
debconf: falling back to frontend: Readline
Setting up libarchive-zip-perl (1.60-1ubuntu0.1) ...
Setting up libtimedate-perl (2.3000-2) ...
Setting up libsigsegv2:amd64 (2.12-1) ...
 Setting up libgpm2:amd64 (1.20.7-5) ...
Setting up libcap2-bin (1:2.25-1.2) ...
Setting up libv4lconvert0:amd64 (1.14.2-1) ...
Setting up libarchive-cpio-perl (0.10-1) ...
Setting up gettext-base (0.19.8.1-6ubuntu0.3) ...
Setting up m4 (1.4.18-1) ...
Setting up libcdparanoia0:amd64 (3.10.2+debian-13) ...
Setting up libmagic-mgc (1:5.32-2ubuntu0.4) ...
 Setting up libmagic1:amd64 (1:5.32-2ubuntu0.4) ...
 Setting up libsys-hostname-long-perl (1.5-1) ...
Setting up libmail-sendmail-perl (0.80-1) ...
 Setting up libaa1:amd64 (1.4p5-44build2) ...
Setting up autotools-dev (20180224.1) ...
Setting up libvisual-0.4-0:amd64 (0.4.0-11) ...
 Setting up liborc-0.4-0:amd64 (1:0.4.28-1) ...
Setting up libshout3:amd64 (2.4.1-2build1) ...
Setting up autopoint (0.19.8.1-6ubuntu0.3) ...
 Setting up libdv4:amd64 (1.0.0-11) ...
 Setting up libtag1v5-vanilla:amd64 (1.11.1+dfsg.1-0.2build2) ...
Setting up libfile-stripnondeterminism-perl (0.040-1.1~build1) ...
 Setting up libtag1v5:amd64 (1.11.1+dfsg.1-0.2build2) ...
Setting up libgstreamer1.0-0:amd64 (1.14.5-0ubuntu1~18.04.2) ...
 Setcap worked! gst-ptp-helper is not suid!
 Setting up gettext (0.19.8.1-6ubuntu0.3) ...
Setting up libv4l-0:amd64 (1.14.2-1) ...
Setting up libgstreamer1.0-0-dbg:amd64 (1.14.5-0ubuntu1~18.04.2) ...
Setting up autoconf (2.69-11) ...
Setting up file (1:5.32-2ubuntu0.4) ...
Setting up intltool-debian (0.35.0+20060710.4) ...
Setting up automake (1:1.15.1-3ubuntu2) ...
 update-alternatives: using /usr/bin/automake-1.15 to provide /usr/bin/automake (automake) i
Setting up gir1.2-gstreamer-1.0:amd64 (1.14.5-0ubuntu1~18.04.2) ...
 Setting up libtool (2.4.6-2) ...
Setting up libgstreamer-plugins-base1.0-0:amd64 (1.14.5-0ubuntu1~18.04.3) ...
Setting up gstreamer1.0-plugins-base:amd64 (1.14.5-0ubuntu1~18.04.3) ...
Setting up po-debconf (1.0.20) ...
 Setting up gstreamer1.0-x:amd64 (1.14.5-0ubuntu1~18.04.3) ...
 Setting up libgstreamer-plugins-good1.0-0:amd64 (1.14.5-0ubuntu1~18.04.2) ...
Setting up libgstreamer1.0-dev:amd64 (1.14.5-0ubuntu1~18.04.2) ...
Setting up gstreamer1.0-plugins-good:amd64 (1.14.5-0ubuntu1~18.04.2) ...
 Setting up debhelper (11.1.6ubuntu2) ...
Setting up dh-autoreconf (17) ...
 Setting up dh-strip-nondeterminism (0.040-1.1~build1) ...
 Processing triggers for libc-bin (2.27-3ubuntu1.3) ...
 /sbin/ldconfig.real: /usr/local/lib/python3.7/dist-packages/ideep4py/lib/libmkldnn.so.0 is
 Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
```

```
ncurses-doc sqlite3-doc
The following NEW packages will be installed:
  libffi-dev libgdbm-compat-dev libgdbm-dev libncursesw5-dev sqlite3
The following packages will be upgraded:
  openss1
1 upgraded, 5 newly installed, 0 to remove and 36 not upgraded.
Need to get 1,804 kB of archives.
After this operation, 4,211 kB of additional disk space will be used.
Get:1 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic-updates/main amd64 openssl amd64 1.1.1-1ubunt
Get:2 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic/main amd64 libgdbm-compat-dev amd64 1.14.1-6
Get:3 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic/main amd64 libgdbm-dev amd64 1.14.1-6 [79.3 k
Get:4 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic-updates/main amd64 libncursesw5-dev amd64 6.1
Get:5 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic-updates/main amd64 sqlite3 amd64 3.22.0-1ubun
Get:6 <a href="http://archive.ubuntu.com/ubuntu">http://archive.ubuntu.com/ubuntu</a> bionic/main amd64 libffi-dev amd64 3.2.1-8 [156 kB]
Fetched 1,804 kB in 1s (1,580 kB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based frontend cannot b
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:
(Reading database ... 158679 files and directories currently installed.)
Preparing to unpack .../0-openssl_1.1.1-1ubuntu2.1~18.04.14_amd64.deb ...
Unpacking openssl (1.1.1-1ubuntu2.1~18.04.14) over (1.1.1-1ubuntu2.1~18.04.7) ...
Selecting previously unselected package libgdbm-compat-dev.
Preparing to unpack .../1-libgdbm-compat-dev_1.14.1-6_amd64.deb ...
Unpacking libgdbm-compat-dev (1.14.1-6) ...
Selecting previously unselected package libgdbm-dev:amd64.
Preparing to unpack .../2-libgdbm-dev_1.14.1-6_amd64.deb ...
Unpacking libgdbm-dev:amd64 (1.14.1-6) ...
Selecting previously unselected package libncursesw5-dev:amd64.
Preparing to unpack .../3-libncursesw5-dev_6.1-1ubuntu1.18.04_amd64.deb ...
Unpacking libncursesw5-dev:amd64 (6.1-1ubuntu1.18.04) ...
Selecting previously unselected package sqlite3.
Preparing to unpack .../4-sqlite3_3.22.0-1ubuntu0.4_amd64.deb ...
Unpacking sqlite3 (3.22.0-1ubuntu0.4) ...
Selecting previously unselected package libffi-dev:amd64.
Preparing to unpack .../5-libffi-dev_3.2.1-8_amd64.deb ...
Unpacking libffi-dev:amd64 (3.2.1-8) ...
Setting up libgdbm-dev:amd64 (1.14.1-6) ...
Setting up libffi-dev:amd64 (3.2.1-8) ...
Setting up sqlite3 (3.22.0-1ubuntu0.4) ...
Setting up libncursesw5-dev:amd64 (6.1-1ubuntu1.18.04) ...
Setting up openssl (1.1.1-1ubuntu2.1~18.04.14) ...
Setting up libgdbm-compat-dev (1.14.1-6) ...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
```

!sudo apt-get install libffi-dev

Reading package lists... Done
Building dependency tree
Reading state information... Done
libffi-dev is already the newest version (3.2.1-8).
0 upgraded, 0 newly installed, 0 to remove and 36 not upgraded.

!buildozer init

Buildozer is running as root!

This is **not** recommended, and may lead to problems later.

Are you sure you want to continue [y/n]? y File buildozer.spec created, ready to customize!

!buildozer -v android debug

Streaming output truncated to the last 5000 lines.

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- 6.2 The data collected is examined in the aggregate to improve the Preview and is maintaine
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- 7.1 If you use the Preview to run applications developed by a third party or that access da
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- 8.1 Google APIs
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```
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```
!buildozer -v android debug
```

```
#
      CUDNN VERSION = '8.0.5.39'
      PYDEVD USE FRAME EVAL = 'NO'
#
      LD_LIBRARY_PATH = '/usr/local/nvidia/lib:/usr/local/nvidia/lib64'
#
#
      CLOUDSDK PYTHON = 'python3'
#
      USE_EPHEM = '1'
      LANG = 'en_US.UTF-8'
#
      ENABLE_DIRECTORYPREFETCHER = '1'
#
      HOSTNAME = 'c63304ed8f67'
#
#
      OLDPWD = '/'
#
      CLOUDSDK_CONFIG = '/content/.config'
#
      NVIDIA_VISIBLE_DEVICES = 'all'
      DATALAB_SETTINGS_OVERRIDES = '{"kernelManagerProxyPort":6000,"kernelManagerProxyHost"
#
      ENV = '/root/.bashrc'
#
#
      PAGER = 'cat'
      NCCL VERSION = '2.7.8'
#
      TF FORCE GPU ALLOW GROWTH = 'true'
#
      JPY_PARENT_PID = '47'
#
      NO GCE_CHECK = 'True'
#
      PWD = '/content'
#
      HOME = '/root'
#
#
      LAST FORCED REBUILD = '20220106'
      CLICOLOR = '1'
#
      DEBIAN_FRONTEND = 'noninteractive'
#
      LIBRARY_PATH = '/usr/local/cuda/lib64/stubs'
#
      GCE_METADATA_TIMEOUT = '0'
#
      GLIBCPP FORCE NEW = '1'
#
      TBE_CREDS_ADDR = '172.28.0.1:8008'
#
      TERM = 'xterm-color'
#
      SHELL = '/bin/bash'
#
#
      GCS_READ_CACHE_BLOCK_SIZE_MB = '16'
#
      PYTHONWARNINGS = 'ignore:::pip. internal.cli.base command'
#
      MPLBACKEND = 'module://ipykernel.pylab.backend inline'
      CUDA VERSION = '11.1.1'
#
#
      NVIDIA_DRIVER_CAPABILITIES = 'compute, utility'
#
      SHLVL = '1'
#
      PYTHONPATH = '/env/python'
      NVIDIA_REQUIRE_CUDA = ('cuda>=11.1 brand=tesla,driver>=418,driver<419 '</pre>
#
 'brand=tesla,driver>=440,driver<441 brand=tesla,driver>=450,driver<451')
      TBE EPHEM CREDS ADDR = '172.28.0.1:8009'
#
#
      COLAB GPU = '0'
#
      GLIBCXX_FORCE_NEW = '1'
      PATH = '/root/.buildozer/android/platform/apache-ant-1.9.4/bin:/usr/local/nvidia/bin:
#
      LD_PRELOAD = '/usr/lib/x86_64-linux-gnu/libtcmalloc.so.4'
#
      GIT_PAGER = 'cat'
#
```

```
= '/usr/local/bin/buildozer'
#
#
      PACKAGES_PATH = '/root/.buildozer/android/packages'
      ANDROIDSDK = '/root/.buildozer/android/platform/android-sdk'
#
      ANDROIDNDK = '/root/.buildozer/android/platform/android-ndk-r19c'
#
      ANDROIDAPI = '27'
#
#
      ANDROIDMINAPI = '21'
#
# Buildozer failed to execute the last command
# The error might be hidden in the log above this error
# Please read the full log, and search for it before
# raising an issue with buildozer itself.
# In case of a bug report, please add a full log with log_level = 2
```

!buildozer -v android debug

```
# Check configuration tokens
Buildozer is running as root!
This is not recommended, and may lead to problems later.
Are you sure you want to continue [y/n]? y
# Ensure build layout
# Create directory /content/bin
# Check configuration tokens
# Read available permissions from api-versions.xml
# Preparing build
# Check requirements for android
# Run 'dpkg --version'
# Cwd None
Debian 'dpkg' package management program version 1.19.0.5 (amd64).
This is free software; see the GNU General Public License version 2 or
later for copying conditions. There is NO warranty.
# Search for Git (git)
# -> found at /usr/bin/git
# Search for Cython (cython)
  -> found at /usr/local/bin/cython
# Search for Java compiler (javac)
  -> found at /usr/lib/jvm/java-11-openjdk-amd64/bin/javac
# Search for Java keytool (keytool)
  -> found at /usr/lib/jvm/java-11-openjdk-amd64/bin/keytool
# Install platform
# Run 'git config --get remote.origin.url'
# Cwd /content/.buildozer/android/platform/python-for-android
https://github.com/kivy/python-for-android.git
# Run 'git branch -vv'
# Cwd /content/.buildozer/android/platform/python-for-android
* master 17aa3e29 [origin/master] Update recipe.py (#2544)
# Run '/usr/bin/python3 -m pip install -q --user \'appdirs\' \'colorama>=0.3.3\' \'jinja2\'
# Cwd None
# Apache ANT found at /root/.buildozer/android/platform/apache-ant-1.9.4
# Android SDK found at /root/.buildozer/android/platform/android-sdk
# Recommended android's NDK version by p4a is: 19c
# Android NDK found at /root/.buildozer/android/platform/android-ndk-r19c
# Read available permissions from api-versions.xml
# Check application requirements
# Check garden requirements
# Compile platform
# Run '/usr/bin/python3 -m pythonforandroid.toolchain create --dist_name=myapp --bootstrap=
# Cwd /content/.buildozer/android/platform/python-for-android
           Recipe kivy: version "2.0.0" requested
[INFO]:
[INFO]:
           Will compile for the following archs: armeabi-v7a
[INFO]:
           Found Android API target in $ANDROIDAPI: 27
```

```
[INFO]:
           Available Android APIs are (27)
           Requested API target 27 is available, continuing.
[INFO]:
           Found NDK dir in $ANDROIDNDK: /root/.buildozer/android/platform/android-ndk-r19c
[INFO]:
           Found NDK version 19c
[INFO]:
           Getting NDK API version (i.e. minimum supported API) from user argument
[INFO]:
           ccache is missing, the build will not be optimized in the future.
[INFO]:
           Found the following toolchain versions: ['4.9']
[INFO]:
[INFO]:
           Picking the latest gcc toolchain, here 4.9
           Of the existing distributions, the following meet the given requirements:
[INFO]:
[INFO]:
                myapp: min API 21, includes recipes (freetype, hostpython3, jpeg, libffi, o
           myapp has compatible recipes, using this one
[INFO]:
# Build the application #3
```