

DataOverSound

데이터 네트워크 연구실
이현호

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Previously

- 제출률 : 70%
- 문제가 어려웠다고 보다는 설명이 미흡 ㅈㅅ
- 채점은 한주만...
- adb 및 개발 환경구축이 헬
- 딜을 해보자

목표

- 다른 프로젝트 import 하기
- 서버환경 구성하기
- 앱 빌드하기
- 소리만들기
- 안드로이드에서 소리 전송하기

Client

Android Studio

- 자신의 운영체제에 맞는 Android studio 설치

Android Studio

Android용 공식 IDE

Android Studio는 모든 유형의 Android 기기에서 앱을 빌드하기 위한 가장 빠른 도구를 제공합니다.

최고 수준의 코드 편집, 디버깅, 성능 도구, 유연한 빌드 시스템 및 인스턴트 빌드/배포 시스템을 사용하여 뛰어난 품질의 앱을 빌드하는 데 집중할 수 있습니다.

ANDROID STUDIO 다운로드
2.3 FOR WINDOWS (1,848 MB)

[문서 읽기](#) [릴리스 노트 보기](#)



[기능](#) [최신 뉴스](#) [리소스](#) [동영상](#) [다운로드 옵션](#)



Pied-pier

- 프로젝트 주소 : <https://github.com/rraval/pied-piper>

The screenshot shows the GitHub repository page for `rraval / pied-piper`. The repository is described as "Data transfer over sound waves". It has 37 commits, 2 branches, 0 releases, and 2 contributors, licensed under MIT. The main branch is `master`. A table lists the repository's files and folders:

File/Folder	Description
<code>rraval</code> [python]	quantity pip requirements
<code>android</code>	[android][python] rejigger to transmit text only
<code>mp3</code>	[mp3] add 2s sample mp3s
<code>.gitignore</code>	[meta] ignore vim swap files

On the right, the "Clone or download" dropdown is open, showing the "Clone with HTTPS" option with the URL `https://github.com/rraval/pied-piper.git`. Other options include "Open in Desktop" and "Download ZIP".

Git Clone

- Git을 Clone하기 : “`git clone https://github.com/rraval/pied-piper.git`”

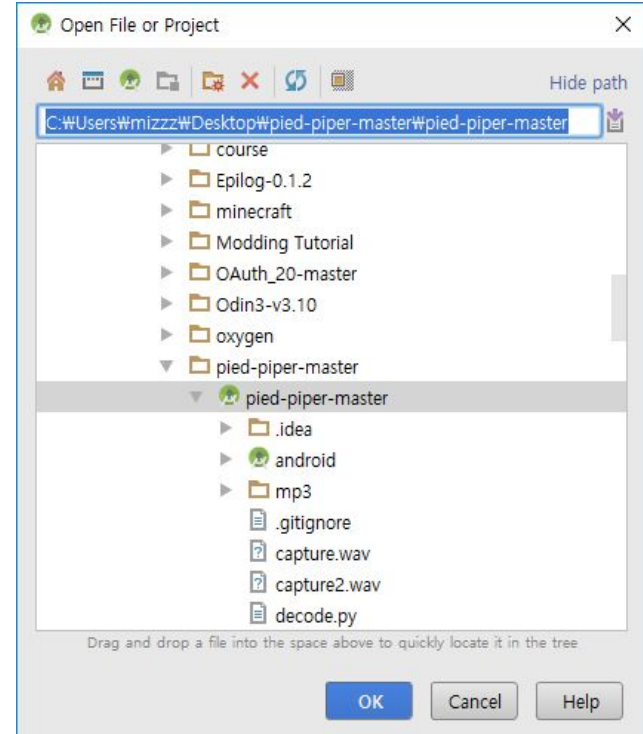
```
drwxr-xr-x  6 hyunholee hyunholee    4096 Apr  5  2016 similarity
drwxr-xr-x  9 hyunholee hyunholee    4096 Mar 11  2016 sokulee
drwxr-xr-x  3 hyunholee hyunholee    4096 Mar 11  2016 sokulee2
drwxr-xr-x  5 hyunholee hyunholee    4096 Mar 29 00:52 soundBeacon
hyunholee@DNLAB ~/workspace $ cd pied-piper/
hyunholee@DNLAB ~/workspace/pied-piper $ ls -al
total 4796
drwxr-xr-x  5 hyunholee hyunholee    4096 Mar 29 10:35 .
drwxr-xr-x 23 hyunholee hyunholee    4096 Mar 29 00:52 ..
drwxr-xr-x  5 hyunholee hyunholee    4096 Mar  7 22:53 android
-rw-r--r--  1 hyunholee hyunholee 1660044 Mar  7 22:53 capture2.wav
-rw-r--r--  1 hyunholee hyunholee 3184204 Mar  7 22:53 capture.wav
-rw-r--r--  1 hyunholee hyunholee   4229 Mar  7 22:53 decode.py
-rw-r--r--  1 hyunholee hyunholee  16384 Mar 29 10:35 .decode.py.swp
drwxr-xr-x  8 hyunholee hyunholee    4096 Mar  7 22:53 .git
-rw-r--r--  1 hyunholee hyunholee     7 Mar  7 22:53 .gitignore
-rw-r--r--  1 hyunholee hyunholee   1111 Mar  7 22:53 LICENSE.txt
drwxr-xr-x  2 hyunholee hyunholee    4096 Mar  7 22:53 mp3
-rw-r--r--  1 hyunholee hyunholee   4024 Mar  7 22:53 README.md
-rw-r--r--  1 hyunholee hyunholee    55 Mar  7 22:53 requirements.txt
hyunholee@DNLAB ~/workspace/pied-piper $ █
```

Execute android studio

```
cse@ClonezillaServer ~/Downloads/android-studio/bin
File Edit View Search Terminal Help
cse@ClonezillaServer ~/Downloads/android-studio $ ls
bin      gradle      jre  license  NOTICE.txt
build.txt  Install-Linux-tar.txt  lib  LICENSE.txt  plugins
cse@ClonezillaServer ~/Downloads/android-studio $ cd bin/
cse@ClonezillaServer ~/Downloads/android-studio/bin $ ls
appletviewer.policy  inspect.sh      log.xml      studio.vmoptions
fsnotifier           libbreakgen64.so  studio64.vmoptions
fsnotifier64         libbreakgen.so   studio.png
idea.properties      lldb            studio.sh
cse@ClonezillaServer ~/Downloads/android-studio/bin $ ./studio.sh
Looking in classpath from com.intellij.util.lang.UrlClassLoader@6d5380c2 for /com/sun/jna/linux-x86-64/libjnidispatch.so
Found library resource at jar:file:/home/cse/Downloads/android-studio/lib/jna.jar!/com/sun/jna/linux-x86-64/libjnidispatch.so
Trying /home/cse/.AndroidStudio2.3/system/tmp/jna8989990407083848872.tmp
Found jnidispatch at /home/cse/.AndroidStudio2.3/system/tmp/jna8989990407083848872.tmp
[ 2957]  WARN - dea.updater.SdkComponentSource - File /home/cse/.android/repositories.cfg could not be loaded.
[ 6593]  WARN - s.RepoProgressIndicatorAdapter - File /home/cse/.android/repositories.cfg could not be loaded.
```

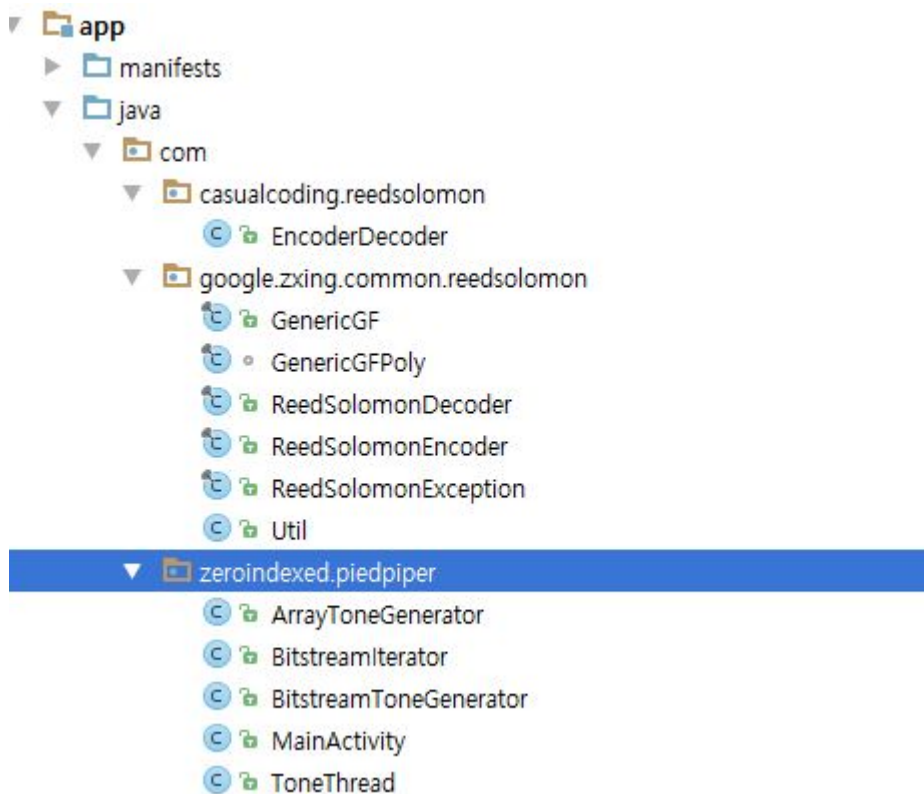

Import Project

- File -> Open
- Project directory -> pied-piper-master
- -> android



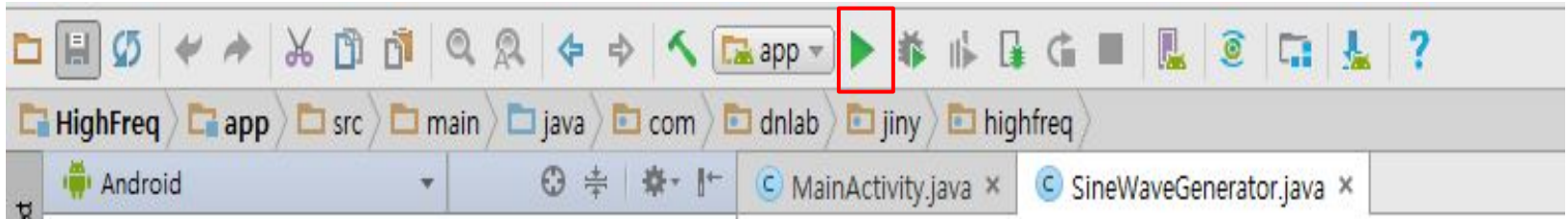
Project structure

- Java -> 5개의 파일
- ToneThread
- MainActivity
- ArrayToneGenerator
- BitstreamIterator
- BitstreamToneGenerator



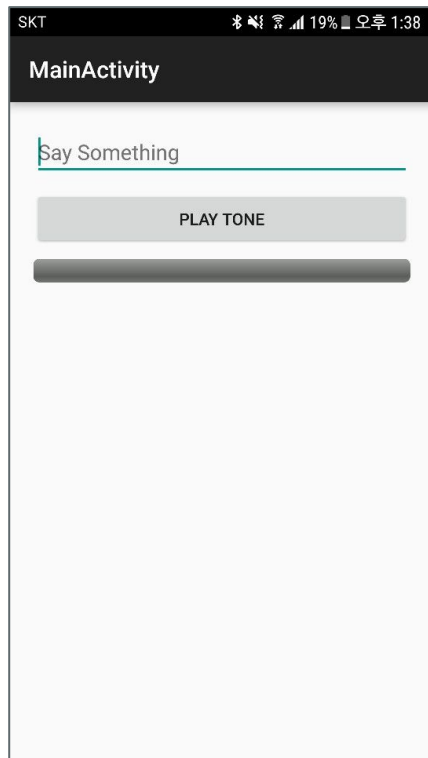
APK Build

- Galaxy A5 를 연결 후 -> run app



MainActivity

- 앱 실행
- 텍스트 입력 후
- PLAY TONE
- 소리가 나는지 확인



Server

decode.py

- decode.py가 실제 소리를 듣는 서버

```
drwxr-xr-x  6 hyunholee hyunholee    4096 Apr  5  2016 similarity
drwxr-xr-x  9 hyunholee hyunholee    4096 Mar 11  2016 sokulee
drwxr-xr-x  3 hyunholee hyunholee    4096 Mar 11  2016 sokulee2
drwxr-xr-x  5 hyunholee hyunholee    4096 Mar 29 00:52 soundBeacon
hyunholee@DNLAB ~/workspace $ cd pied-piper/
hyunholee@DNLAB ~/workspace/pied-piper $ ls -al
total 4796
drwxr-xr-x  5 hyunholee hyunholee    4096 Mar 29 10:35 .
drwxr-xr-x 23 hyunholee hyunholee    4096 Mar 29 00:52 ..
drwxr-xr-x  5 hyunholee hyunholee    4096 Mar  7 22:53 android
-rw-r--r--  1 hyunholee hyunholee 1660044 Mar  7 22:53 capture2.wav
-rw-r--r--  1 hyunholee hyunholee 3184204 Mar  7 22:53 capture.wav
-rw-r--r--  1 hyunholee hyunholee   4229 Mar  7 22:53 decode.py
-rw-r--r--  1 hyunholee hyunholee  16384 Mar 29 10:35 .decode.py.swp
drwxr-xr-x  8 hyunholee hyunholee    4096 Mar  7 22:53 .git
-rw-r--r--  1 hyunholee hyunholee     7 Mar  7 22:53 .gitignore
-rw-r--r--  1 hyunholee hyunholee   1111 Mar  7 22:53 LICENSE.txt
drwxr-xr-x  2 hyunholee hyunholee    4096 Mar  7 22:53 mp3
-rw-r--r--  1 hyunholee hyunholee   4024 Mar  7 22:53 README.md
-rw-r--r--  1 hyunholee hyunholee    55 Mar  7 22:53 requirements.txt
hyunholee@DNLAB ~/workspace/pied-piper $
```

decode.py 실행

- 실행 해보자 -> error

```
crawler@DNLAB:~/workspace/pied-piper$ python decode.py
Traceback (most recent call last):
  File "decode.py", line 8, in <module>
    import alsaaudio
ImportError: No module named alsaaudio
crawler@DNLAB:~/workspace/pied-piper$
```

```
crawler@DNLAB:~/workspace/pied-piper$ cat requirements.txt
colorama
numpy
pyalsaaudio
pyfiglet
reedsolo
termcolor
```

Python library

- “sudo pip install alsaudio” -> error

```
crawler@DNLAB:~/workspace/pied-piper$ sudo pip install alsaudio
The directory '/home/crawler/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
The directory '/home/crawler/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
Collecting alsaudio
  Could not find a version that satisfies the requirement alsaudio (from versions: )
No matching distribution found for alsaudio
You are using pip version 8.1.1, however version 9.0.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
```


Python library

- error!

```
crawler@DNLAB:~/workspace/pied-piper$ sudo pip install pyalsaaudio
The directory '/home/crawler/.cache/pip/http' or its parent directory is not owned by the current user and the cache has been disabled. Please check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
The directory '/home/crawler/.cache/pip' or its parent directory is not owned by the current user and caching wheels has been disabled. Check the permissions and owner of that directory. If executing pip with sudo, you may want sudo's -H flag.
Collecting pyalsaaudio
  Downloading pyalsaaudio-0.8.4.tar.gz (315kB)
    100% |#####| 317kB 2.0MB/s
Installing collected packages: pyalsaaudio
  Running setup.py install for pyalsaaudio ... error
    Complete output from command /usr/bin/python -u -c "import setuptools, tokenize;__file__='/tmp/pip-build-bo7PQT/pyalsaaudio/setup.py';exec(compile(getattr(tokenize, 'open', open)(__file__).read().replace('\r\n', '\n'), __file__, 'exec'))" install --record /tmp/pip-uKyqaq-record/install-record.txt --single-version-externally-managed --compile:
      running install
      running build
      running build_ext
      building 'alsaaudio' extension
      creating build
      creating build/temp.linux-x86_64-2.7
      x86_64-linux-gnu-gcc -pthread -DNDEBUG -g -fwrapv -O2 -Wall -Wstrict-prototypes -fno-strict-aliasing -Wdate-time -D_FORTIFY_SOURCE=2 -g -fstack-protector-strong -Wformat -Werror=format-security -fPIC -I/usr/include/python2.7 -c alsaaudio.c -o build/temp.linux-x86_64-2.7/alsaaudio.o
      alsaaudio.c:28:28: fatal error: alsa/asoundlib.h: No such file or directory
      compilation terminated.
      error: command 'x86_64-linux-gnu-gcc' failed with exit status 1

-----
Command "/usr/bin/python -u -c "import setuptools, tokenize;__file__='/tmp/pip-build-bo7PQT/pyalsaaudio/setup.py';exec(compile(getattr(tokenize, 'open', open)(__file__).read().replace('\r\n', '\n'), __file__, 'exec'))" install --record /tmp/pip-uKyqaq-record/install-record.txt --single-version-externally-managed --compile" failed with error code 1 in /tmp/pip-build-bo7PQT/pyalsaaudio/
You are using pip version 8.1.1, however version 9.0.1 is available.
You should consider upgrading via the 'pip install --upgrade pip' command.
```

Excute

- “sudo apt-get update” - apt-get을 업데이트
- “sudo apt-get install python-dev” python-dev 설치
- “sudo apt-get install python-pip” pip 설치
- 여기까지 python 관련 모듈 관리 프로그램 설치
- python2, python3가 다르니 유의
- “sudo apt-get install libasound2-dev” audio관련 모듈 설치

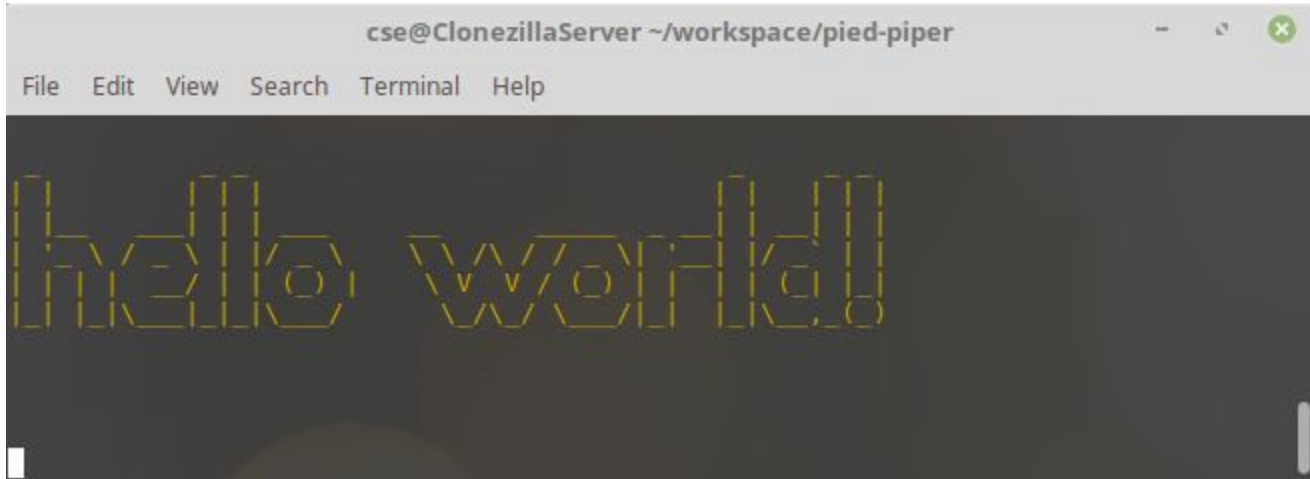
Success

- 이제 requirement.txt에서 필요한 모듈들 설치

```
hyunhoLee@DNLAB ~/workspace/pied-piper $ sudo pip install pyalsaaudio
[sudo] password for hyunhoLee:
Requirement already satisfied (use --upgrade to upgrade): pyalsaaudio in /usr/local/lib/python2.7/dist-packages
Cleaning up...
```

```
hyunhoLee@DNLAB ~/workspace/pied-piper $ python decode.py
```

Hello World!



Assignment

- Q1. 클라이언트 설치과정 설명
- Q2. 서버 설치과정 설명
- Q3. 코드의 함수, 메소드 단위 분석
- Q4. 실제 실험하기
 - 마이크에서 전송되는 최대거리는 몇 m인가?
 - 텍스트가 깨지지않고 최대 얼마나 전송되는가?
 - 소리통신의 장, 단점은?

과제 제출

- 과제 제출 기한:
 - 실습 하루 전 18시
- Google Classroom에 제출
 - E-mail이 아닌 Classroom
- 보고서 제목 : DC_학번_이름_실습번호.pdf
- 추가 첨부파일 : DC_학번_이름_실습번호.zip

제출 파일 내용

- DC_학번_이름_실습번호.zip
 - 각종 소스코드
 - 그 외 파일
 - 보고서는 .pdf (**DC_학번_이름_실습번호.pdf**)
 - .hwp/.doc 등 채점 안 함
- 파일 이름 준수!
 - 파일 이름이 다를 경우 채점 안 함

보고서

- 과제를 해결한 방법
 - 주요 소스코드 포함 및 주석
- 과제를 해결하기 위해 알아야 하는 것
- 결과 화면 캡처와 설명
- 기본적으로 보고서는 자신이 직접 과제를 해결했다는 것을 증명하기 위함