Untitled

April 2, 2024

```python
[1]: folder_path = r"C:\Users\V_KHAT\Desktop\Train"
     def process_folder(folder_path):
         counts = {}
         for emotion in os.listdir(folder_path):
             emotion_path = os.path.join(folder_path, emotion)
             if os.path.isdir(emotion_path):
                 # Remove "male_" or "female_" prefix from emotion folder name
                 emotion = emotion.split("_", 1)[1]
                 for audioFile in os.listdir(emotion_path):
                     if audioFile.endswith(".wav"):  # Assuming audio files have .
     ↪wav extension
                         # Create save path
                         save_path_train = os.path.join(OUTPUT_FOLDER_TRAIN, emotion)
                         os.makedirs(save_path_train, exist_ok=True)  # Create␣
     ↪directory if not exists
                         # Load audio file and process spectrogram (rest of your␣
     ↪code)
                         # Update count and save the image
                         count = counts.get(emotion, 1)
                         p = os.path.join(save_path_train, "{}{}.jpg".
     ↪format(emotion, str(count).zfill(6)))
                         counts[emotion] = count + 1
                         # Save to the aforementioned path
                         print("Processing:", audioFile, "Saving to:", p)
         print("Done!")

     # Process male and female folders
     process_folder(MALE_FOLDER)
     process_folder(FEMALE_FOLDER)
```

```
    ---------------------------------------------------------------------------
    NameError                                 Traceback (most recent call last)
    <ipython-input-1-bd0c2f667f32> in <module>
         22
         23 # Process male and female folders
    ---> 24 process_folder(MALE_FOLDER)
         25 process_folder(FEMALE_FOLDER)
```

```
NameError: name 'MALE_FOLDER' is not defined
```

```python
[2]: import os
     import shutil

     # List of emotions
     emotions = ["angry", "calm", "disgusted", "fearful", "happy", "neutral", "sad",
      ↪"surprised"]

     # Base directory
     base_dir = r"C:\Users\V_KHAT\Desktop\Train"

     def merge_and_rename_files(emotion):
         # Define source directories
         female_dir = os.path.join(base_dir, f"female_{emotion}")
         male_dir = os.path.join(base_dir, f"male_{emotion}")

         # Define destination directory
         dst_dir = os.path.join(base_dir, emotion)

         # Ensure the destination directory exists
         if not os.path.exists(dst_dir):
             os.makedirs(dst_dir)

         # Function to copy and rename files
         def copy_and_rename_files(src_dir, gender_prefix):
             for filename in os.listdir(src_dir):
                 if os.path.isfile(os.path.join(src_dir, filename)):
                     # Construct new filename with the gender prefix
                     new_filename = f"{gender_prefix}{filename}"
                     # Copy each file to the destination directory with the new name
                     shutil.copy(os.path.join(src_dir, filename), os.path.
      ↪join(dst_dir, new_filename))

         # Copy and rename files
         copy_and_rename_files(female_dir, "female_")
         copy_and_rename_files(male_dir, "male_")

     # Process each emotion
     for emotion in emotions:
         merge_and_rename_files(emotion)
```

```python
[4]: import os

     # Base directory
```

```
base_dir = r"C:\Users\V_KHAT\Desktop\Train"

# List of emotions
emotions = ["angry", "calm", "disgusted", "fearful", "happy", "neutral", "sad",
 ↪"surprised"]

counts = {}
for emotion in emotions:
    # Define source directory
    src_dir = os.path.join(base_dir, emotion)

    # Iterate over all the files in source directory
    for filename in sorted(os.listdir(src_dir)):
        if os.path.isfile(os.path.join(src_dir, filename)):
            # Construct new filename without the gender prefix
            new_filename = filename.split('_')[-1]

            # Logic to skip the count by 1 every time the count is a multiple
 ↪of 8
            count = counts.get(emotion, 1)
            if count % 8 == 0:
                count += 1
            new_filename = emotion + str(count).zfill(6) + '.jpg'
            counts[emotion] = count + 1

            # Rename the file
            os.rename(os.path.join(src_dir, filename), os.path.join(src_dir,
 ↪new_filename))
```

```
[5]: # Create from imagenet style dataset in path with train and valid subfolders
     ↪(or provide valid_pct)
     dls = ImageDataLoaders.from_folder(base_dir, valid_pct=0.2, seed=42,
     ↪num_workers=0)
     dls.valid_ds.items[:10]
```

```
    ---------------------------------------------------------------------------
    NameError                                 Traceback (most recent call last)
    <ipython-input-5-bb697b5c440f> in <module>
          1 # Create from imagenet style dataset in path with train and valid
     ↪subfolders (or provide valid_pct)
    ----> 2 dls = ImageDataLoaders.from_folder(base_dir, valid_pct=0.2, seed=42,
     ↪num_workers=0)
          3 dls.valid_ds.items[:10]

    NameError: name 'ImageDataLoaders' is not defined
```

```
[7]: !pip install fastai
```

Defaulting to user installation because normal site-packages is not writeable

  WARNING: The script weasel.exe is installed in
'C:\Users\V_KHAT\AppData\Roaming\Python\Python38\Scripts' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this
warning, use --no-warn-script-location.
  WARNING: The script spacy.exe is installed in
'C:\Users\V_KHAT\AppData\Roaming\Python\Python38\Scripts' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this
warning, use --no-warn-script-location.
  WARNING: The scripts convert-caffe2-to-onnx.exe, convert-onnx-to-caffe2.exe
and torchrun.exe are installed in
'C:\Users\V_KHAT\AppData\Roaming\Python\Python38\Scripts' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this
warning, use --no-warn-script-location.
  WARNING: The script configure_accelerate.exe is installed in
'C:\Users\V_KHAT\AppData\Roaming\Python\Python38\Scripts' which is not on PATH.
  Consider adding this directory to PATH or, if you prefer to suppress this
warning, use --no-warn-script-location.

Collecting fastai
  Downloading fastai-2.7.14-py3-none-any.whl (232 kB)
Requirement already satisfied: pandas in c:\anaconda3\lib\site-packages (from
fastai) (1.1.3)
Collecting fastprogress>=0.2.4
  Downloading fastprogress-1.0.3-py3-none-any.whl (12 kB)
Collecting fastcore<1.6,>=1.5.29
  Downloading fastcore-1.5.29-py3-none-any.whl (67 kB)
Collecting spacy<4
  Downloading spacy-3.7.4-cp38-cp38-win_amd64.whl (12.5 MB)
Collecting torch<2.3,>=1.10
  Downloading torch-2.2.2-cp38-cp38-win_amd64.whl (198.6 MB)
Requirement already satisfied: matplotlib in c:\anaconda3\lib\site-packages
(from fastai) (3.3.2)
Requirement already satisfied: pip in c:\anaconda3\lib\site-packages (from
fastai) (20.2.4)
Requirement already satisfied: requests in c:\anaconda3\lib\site-packages (from
fastai) (2.24.0)
Requirement already satisfied: pyyaml in c:\anaconda3\lib\site-packages (from
fastai) (5.3.1)
Requirement already satisfied: scikit-learn in c:\anaconda3\lib\site-packages
(from fastai) (0.23.2)
Collecting torchvision>=0.11
  Downloading torchvision-0.17.2-cp38-cp38-win_amd64.whl (1.2 MB)
Requirement already satisfied: scipy in c:\anaconda3\lib\site-packages (from

```
fastai) (1.5.2)
Collecting fastdownload<2,>=0.0.5
  Downloading fastdownload-0.0.7-py3-none-any.whl (12 kB)
Collecting pillow>=9.0.0
  Downloading pillow-10.3.0-cp38-cp38-win_amd64.whl (2.5 MB)
Requirement already satisfied: packaging in c:\anaconda3\lib\site-packages (from
fastai) (20.4)
Requirement already satisfied: numpy>=1.15.4 in c:\anaconda3\lib\site-packages
(from pandas->fastai) (1.19.2)
Requirement already satisfied: pytz>=2017.2 in c:\anaconda3\lib\site-packages
(from pandas->fastai) (2020.1)
Requirement already satisfied: python-dateutil>=2.7.3 in c:\anaconda3\lib\site-
packages (from pandas->fastai) (2.8.1)
Requirement already satisfied: jinja2 in c:\anaconda3\lib\site-packages (from
spacy<4->fastai) (2.11.2)
Collecting spacy-legacy<3.1.0,>=3.0.11
  Downloading spacy_legacy-3.0.12-py2.py3-none-any.whl (29 kB)
Collecting murmurhash<1.1.0,>=0.28.0
  Downloading murmurhash-1.0.10-cp38-cp38-win_amd64.whl (25 kB)
Collecting preshed<3.1.0,>=3.0.2
  Downloading preshed-3.0.9-cp38-cp38-win_amd64.whl (122 kB)
Collecting wasabi<1.2.0,>=0.9.1
  Downloading wasabi-1.1.2-py3-none-any.whl (27 kB)
Requirement already satisfied: setuptools in c:\anaconda3\lib\site-packages
(from spacy<4->fastai) (50.3.1.post20201107)
Collecting pydantic!=1.8,!=1.8.1,<3.0.0,>=1.7.4
  Downloading pydantic-2.6.4-py3-none-any.whl (394 kB)
Collecting srsly<3.0.0,>=2.4.3
  Downloading srsly-2.4.8-cp38-cp38-win_amd64.whl (483 kB)
Collecting cymem<2.1.0,>=2.0.2
  Downloading cymem-2.0.8-cp38-cp38-win_amd64.whl (39 kB)
Collecting weasel<0.4.0,>=0.1.0
  Downloading weasel-0.3.4-py3-none-any.whl (50 kB)
Collecting langcodes<4.0.0,>=3.2.0
  Downloading langcodes-3.3.0-py3-none-any.whl (181 kB)
Requirement already satisfied: tqdm<5.0.0,>=4.38.0 in c:\anaconda3\lib\site-
packages (from spacy<4->fastai) (4.50.2)
Collecting smart-open<7.0.0,>=5.2.1
  Downloading smart_open-6.4.0-py3-none-any.whl (57 kB)
Collecting spacy-loggers<2.0.0,>=1.0.0
  Downloading spacy_loggers-1.0.5-py3-none-any.whl (22 kB)
Collecting thinc<8.3.0,>=8.2.2
  Downloading thinc-8.2.3-cp38-cp38-win_amd64.whl (1.5 MB)
Collecting typer<0.10.0,>=0.3.0
  Downloading typer-0.9.4-py3-none-any.whl (45 kB)
Collecting catalogue<2.1.0,>=2.0.6
  Downloading catalogue-2.0.10-py3-none-any.whl (17 kB)
Collecting typing-extensions>=4.8.0
```

```
    Downloading typing_extensions-4.10.0-py3-none-any.whl (33 kB)
Requirement already satisfied: sympy in c:\anaconda3\lib\site-packages (from
torch<2.3,>=1.10->fastai) (1.6.2)
Requirement already satisfied: networkx in c:\anaconda3\lib\site-packages (from
torch<2.3,>=1.10->fastai) (2.5)
Requirement already satisfied: filelock in c:\anaconda3\lib\site-packages (from
torch<2.3,>=1.10->fastai) (3.0.12)
Requirement already satisfied: fsspec in c:\anaconda3\lib\site-packages (from
torch<2.3,>=1.10->fastai) (0.8.3)
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in
c:\anaconda3\lib\site-packages (from matplotlib->fastai) (2.4.7)
Requirement already satisfied: certifi>=2020.06.20 in c:\anaconda3\lib\site-
packages (from matplotlib->fastai) (2020.6.20)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\anaconda3\lib\site-
packages (from matplotlib->fastai) (1.3.0)
Requirement already satisfied: cycler>=0.10 in c:\anaconda3\lib\site-packages
(from matplotlib->fastai) (0.10.0)
Requirement already satisfied: chardet<4,>=3.0.2 in c:\anaconda3\lib\site-
packages (from requests->fastai) (3.0.4)
Requirement already satisfied: urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in
c:\anaconda3\lib\site-packages (from requests->fastai) (1.25.11)
Requirement already satisfied: idna<3,>=2.5 in c:\anaconda3\lib\site-packages
(from requests->fastai) (2.10)
Requirement already satisfied: threadpoolctl>=2.0.0 in c:\anaconda3\lib\site-
packages (from scikit-learn->fastai) (2.1.0)
Requirement already satisfied: joblib>=0.11 in c:\anaconda3\lib\site-packages
(from scikit-learn->fastai) (0.17.0)
Requirement already satisfied: six in c:\anaconda3\lib\site-packages (from
packaging->fastai) (1.15.0)
Requirement already satisfied: MarkupSafe>=0.23 in c:\anaconda3\lib\site-
packages (from jinja2->spacy<4->fastai) (1.1.1)
Collecting colorama>=0.4.6; sys_platform == "win32" and python_version >= "3.7"
  Downloading colorama-0.4.6-py2.py3-none-any.whl (25 kB)
Collecting annotated-types>=0.4.0
  Downloading annotated_types-0.6.0-py3-none-any.whl (12 kB)
Collecting pydantic-core==2.16.3
  Downloading pydantic_core-2.16.3-cp38-none-win_amd64.whl (1.9 MB)
Collecting confection<0.2.0,>=0.0.4
  Downloading confection-0.1.4-py3-none-any.whl (35 kB)
Collecting cloudpathlib<0.17.0,>=0.7.0
  Downloading cloudpathlib-0.16.0-py3-none-any.whl (45 kB)
Collecting blis<0.8.0,>=0.7.8
  Downloading blis-0.7.11-cp38-cp38-win_amd64.whl (6.6 MB)
Requirement already satisfied: click<9.0.0,>=7.1.1 in c:\anaconda3\lib\site-
packages (from typer<0.10.0,>=0.3.0->spacy<4->fastai) (7.1.2)
Requirement already satisfied: mpmath>=0.19 in c:\anaconda3\lib\site-packages
(from sympy->torch<2.3,>=1.10->fastai) (1.1.0)
Requirement already satisfied: decorator>=4.3.0 in c:\anaconda3\lib\site-
```

packages (from networkx->torch<2.3,>=1.10->fastai) (4.4.2)
Installing collected packages: fastprogress, fastcore, spacy-legacy, murmurhash,
cymem, preshed, colorama, wasabi, typing-extensions, annotated-types, pydantic-
core, pydantic, catalogue, srsly, smart-open, confection, typer, cloudpathlib,
weasel, langcodes, spacy-loggers, blis, thinc, spacy, torch, pillow,
torchvision, fastdownload, fastai
Successfully installed annotated-types-0.6.0 blis-0.7.11 catalogue-2.0.10
cloudpathlib-0.16.0 colorama-0.4.6 confection-0.1.4 cymem-2.0.8 fastai-2.7.14
fastcore-1.5.29 fastdownload-0.0.7 fastprogress-1.0.3 langcodes-3.3.0
murmurhash-1.0.10 pillow-10.3.0 preshed-3.0.9 pydantic-2.6.4 pydantic-
core-2.16.3 smart-open-6.4.0 spacy-3.7.4 spacy-legacy-3.0.12 spacy-loggers-1.0.5
srsly-2.4.8 thinc-8.2.3 torch-2.2.2 torchvision-0.17.2 typer-0.9.4 typing-
extensions-4.10.0 wasabi-1.1.2 weasel-0.3.4

```
[8]: from fastai.vision.all import *
```

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
<ipython-input-8-5635efd54484> in <module>
----> 1 from fastai.vision.all import *

ModuleNotFoundError: No module named 'fastai'
```

```
[9]: import fastai
```

```
---------------------------------------------------------------------------
ModuleNotFoundError                       Traceback (most recent call last)
<ipython-input-9-af1f7fb2dc52> in <module>
----> 1 import fastai

ModuleNotFoundError: No module named 'fastai'
```

```
[10]: !pip install fastai --upgrade
```

Defaulting to user installation because normal site-packages is not writeable
Requirement already up-to-date: fastai in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (2.7.14)
Requirement already satisfied, skipping upgrade: pip in c:\anaconda3\lib\site-
packages (from fastai) (20.2.4)
Requirement already satisfied, skipping upgrade: fastprogress>=0.2.4 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from fastai)
(1.0.3)
Requirement already satisfied, skipping upgrade: spacy<4 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from fastai)
(3.7.4)
Requirement already satisfied, skipping upgrade: fastcore<1.6,>=1.5.29 in

c:\users\v_khat\appdata\roaming\python\python38\site-packages (from fastai)
(1.5.29)
Requirement already satisfied, skipping upgrade: torchvision>=0.11 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from fastai)
(0.17.2)
Requirement already satisfied, skipping upgrade: torch<2.3,>=1.10 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from fastai)
(2.2.2)
Requirement already satisfied, skipping upgrade: pandas in
c:\anaconda3\lib\site-packages (from fastai) (1.1.3)
Requirement already satisfied, skipping upgrade: requests in
c:\anaconda3\lib\site-packages (from fastai) (2.24.0)
Requirement already satisfied, skipping upgrade: matplotlib in
c:\anaconda3\lib\site-packages (from fastai) (3.3.2)
Requirement already satisfied, skipping upgrade: scipy in c:\anaconda3\lib\site-
packages (from fastai) (1.5.2)
Requirement already satisfied, skipping upgrade: packaging in
c:\anaconda3\lib\site-packages (from fastai) (20.4)
Requirement already satisfied, skipping upgrade: pyyaml in
c:\anaconda3\lib\site-packages (from fastai) (5.3.1)
Requirement already satisfied, skipping upgrade: scikit-learn in
c:\anaconda3\lib\site-packages (from fastai) (0.23.2)
Requirement already satisfied, skipping upgrade: fastdownload<2,>=0.0.5 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from fastai)
(0.0.7)
Requirement already satisfied, skipping upgrade: pillow>=9.0.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from fastai)
(10.3.0)
Requirement already satisfied, skipping upgrade: setuptools in
c:\anaconda3\lib\site-packages (from spacy<4->fastai) (50.3.1.post20201107)
Requirement already satisfied, skipping upgrade: spacy-legacy<3.1.0,>=3.0.11 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (3.0.12)
Requirement already satisfied, skipping upgrade: langcodes<4.0.0,>=3.2.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (3.3.0)
Requirement already satisfied, skipping upgrade: numpy>=1.15.0; python_version <
"3.9" in c:\anaconda3\lib\site-packages (from spacy<4->fastai) (1.19.2)
Requirement already satisfied, skipping upgrade: preshed<3.1.0,>=3.0.2 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (3.0.9)
Requirement already satisfied, skipping upgrade: murmurhash<1.1.0,>=0.28.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (1.0.10)
Requirement already satisfied, skipping upgrade: cymem<2.1.0,>=2.0.2 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (2.0.8)
Requirement already satisfied, skipping upgrade: srsly<3.0.0,>=2.4.3 in

```
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (2.4.8)
Requirement already satisfied, skipping upgrade: typer<0.10.0,>=0.3.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (0.9.4)
Requirement already satisfied, skipping upgrade: smart-open<7.0.0,>=5.2.1 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (6.4.0)
Requirement already satisfied, skipping upgrade: catalogue<2.1.0,>=2.0.6 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (2.0.10)
Requirement already satisfied, skipping upgrade: spacy-loggers<2.0.0,>=1.0.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (1.0.5)
Requirement already satisfied, skipping upgrade: thinc<8.3.0,>=8.2.2 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (8.2.3)
Requirement already satisfied, skipping upgrade: wasabi<1.2.0,>=0.9.1 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (1.1.2)
Requirement already satisfied, skipping upgrade:
pydantic!=1.8,!=1.8.1,<3.0.0,>=1.7.4 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (2.6.4)
Requirement already satisfied, skipping upgrade: jinja2 in
c:\anaconda3\lib\site-packages (from spacy<4->fastai) (2.11.2)
Requirement already satisfied, skipping upgrade: tqdm<5.0.0,>=4.38.0 in
c:\anaconda3\lib\site-packages (from spacy<4->fastai) (4.50.2)
Requirement already satisfied, skipping upgrade: weasel<0.4.0,>=0.1.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
spacy<4->fastai) (0.3.4)
Requirement already satisfied, skipping upgrade: sympy in c:\anaconda3\lib\site-
packages (from torch<2.3,>=1.10->fastai) (1.6.2)
Requirement already satisfied, skipping upgrade: typing-extensions>=4.8.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
torch<2.3,>=1.10->fastai) (4.10.0)
Requirement already satisfied, skipping upgrade: networkx in
c:\anaconda3\lib\site-packages (from torch<2.3,>=1.10->fastai) (2.5)
Requirement already satisfied, skipping upgrade: filelock in
c:\anaconda3\lib\site-packages (from torch<2.3,>=1.10->fastai) (3.0.12)
Requirement already satisfied, skipping upgrade: fsspec in
c:\anaconda3\lib\site-packages (from torch<2.3,>=1.10->fastai) (0.8.3)
Requirement already satisfied, skipping upgrade: python-dateutil>=2.7.3 in
c:\anaconda3\lib\site-packages (from pandas->fastai) (2.8.1)
Requirement already satisfied, skipping upgrade: pytz>=2017.2 in
c:\anaconda3\lib\site-packages (from pandas->fastai) (2020.1)
Requirement already satisfied, skipping upgrade: certifi>=2017.4.17 in
c:\anaconda3\lib\site-packages (from requests->fastai) (2020.6.20)
```

```
Requirement already satisfied, skipping upgrade:
urllib3!=1.25.0,!=1.25.1,<1.26,>=1.21.1 in c:\anaconda3\lib\site-packages (from
requests->fastai) (1.25.11)
Requirement already satisfied, skipping upgrade: idna<3,>=2.5 in
c:\anaconda3\lib\site-packages (from requests->fastai) (2.10)
Requirement already satisfied, skipping upgrade: chardet<4,>=3.0.2 in
c:\anaconda3\lib\site-packages (from requests->fastai) (3.0.4)
Requirement already satisfied, skipping upgrade:
pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in c:\anaconda3\lib\site-packages (from
matplotlib->fastai) (2.4.7)
Requirement already satisfied, skipping upgrade: cycler>=0.10 in
c:\anaconda3\lib\site-packages (from matplotlib->fastai) (0.10.0)
Requirement already satisfied, skipping upgrade: kiwisolver>=1.0.1 in
c:\anaconda3\lib\site-packages (from matplotlib->fastai) (1.3.0)
Requirement already satisfied, skipping upgrade: six in c:\anaconda3\lib\site-
packages (from packaging->fastai) (1.15.0)
Requirement already satisfied, skipping upgrade: joblib>=0.11 in
c:\anaconda3\lib\site-packages (from scikit-learn->fastai) (0.17.0)
Requirement already satisfied, skipping upgrade: threadpoolctl>=2.0.0 in
c:\anaconda3\lib\site-packages (from scikit-learn->fastai) (2.1.0)
Requirement already satisfied, skipping upgrade: click<9.0.0,>=7.1.1 in
c:\anaconda3\lib\site-packages (from typer<0.10.0,>=0.3.0->spacy<4->fastai)
(7.1.2)
Requirement already satisfied, skipping upgrade: confection<1.0.0,>=0.0.1 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
thinc<8.3.0,>=8.2.2->spacy<4->fastai) (0.1.4)
Requirement already satisfied, skipping upgrade: blis<0.8.0,>=0.7.8 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
thinc<8.3.0,>=8.2.2->spacy<4->fastai) (0.7.11)
Requirement already satisfied, skipping upgrade: colorama>=0.4.6; sys_platform
== "win32" and python_version >= "3.7" in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
wasabi<1.2.0,>=0.9.1->spacy<4->fastai) (0.4.6)
Requirement already satisfied, skipping upgrade: pydantic-core==2.16.3 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
pydantic!=1.8,!=1.8.1,<3.0.0,>=1.7.4->spacy<4->fastai) (2.16.3)
Requirement already satisfied, skipping upgrade: annotated-types>=0.4.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
pydantic!=1.8,!=1.8.1,<3.0.0,>=1.7.4->spacy<4->fastai) (0.6.0)
Requirement already satisfied, skipping upgrade: MarkupSafe>=0.23 in
c:\anaconda3\lib\site-packages (from jinja2->spacy<4->fastai) (1.1.1)
Requirement already satisfied, skipping upgrade: cloudpathlib<0.17.0,>=0.7.0 in
c:\users\v_khat\appdata\roaming\python\python38\site-packages (from
weasel<0.4.0,>=0.1.0->spacy<4->fastai) (0.16.0)
Requirement already satisfied, skipping upgrade: mpmath>=0.19 in
c:\anaconda3\lib\site-packages (from sympy->torch<2.3,>=1.10->fastai) (1.1.0)
Requirement already satisfied, skipping upgrade: decorator>=4.3.0 in
c:\anaconda3\lib\site-packages (from networkx->torch<2.3,>=1.10->fastai) (4.4.2)
```

```python
[1]: import fastai
```

```python
[2]: from fastai.vision.all import *
```

```python
[5]: # Create from imagenet style dataset in path with train and valid subfolders␣
     ↪(or provide valid_pct)
     dls = ImageDataLoaders.from_folder(base_dir, valid_pct=0.2, seed=42,␣
     ↪num_workers=0)
     dls.valid_ds.items[:10]
```

```
[5]: [Path('C:/Users/V_KHAT/Desktop/Train/fearful/fearful000090.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/angry/angry000051.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/angry/angry000035.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/calm/calm000149.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/calm/calm000035.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/happy/happy000055.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/happy/happy000060.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/fearful/fearful000142.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/happy/happy000113.jpg'),
      Path('C:/Users/V_KHAT/Desktop/Train/calm/calm000068.jpg')]
```

```python
[4]: base_dir = r"C:\Users\V_KHAT\Desktop\Train"
```

```python
[7]: learn = cnn_learner(dls, models.resnet34, loss_func=CrossEntropyLossFlat(),␣
     ↪metrics=accuracy)

     # Run the learning rate finder
     lr_find_res = learn.lr_find()

     # Plot learning rate finder
     lr_find_res.plot()

     # Get the learning rates and losses
     lrs = lr_find_res.lrs
     losses = lr_find_res.losses

     # Find learning rate with minimum loss
     lr_min = lrs[np.argmin(losses)]

     # Find steepest point
     lr_steep = lrs[np.gradient(losses).argmax()]

     print(f"Minimum/10: {lr_min:.2e}, steepest point: {lr_steep:.2e}")
```
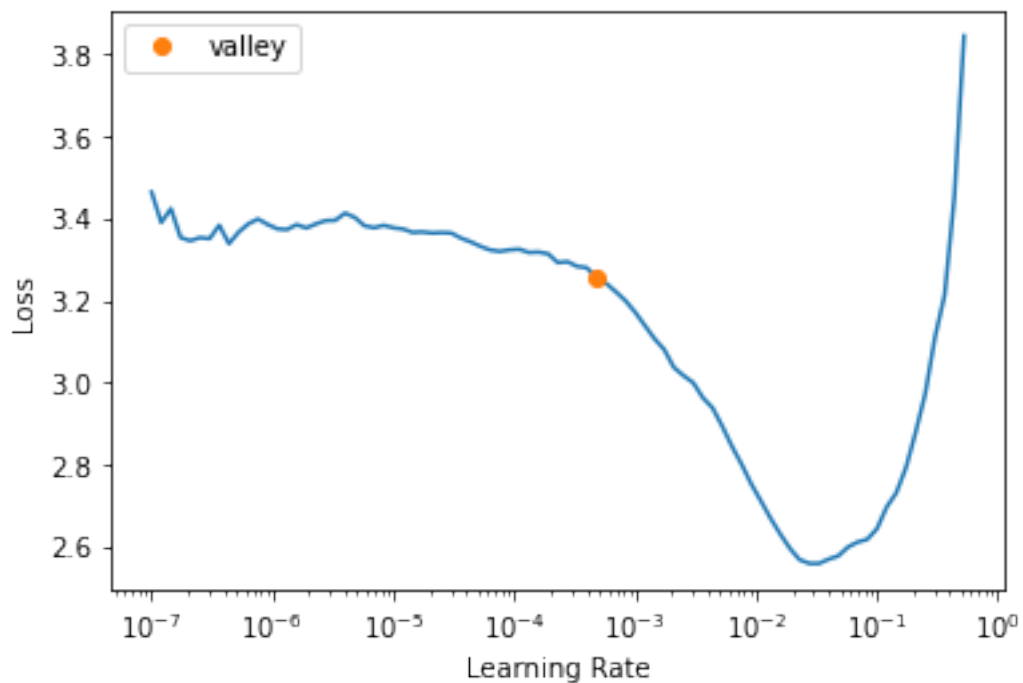
```
<IPython.core.display.HTML object>

<IPython.core.display.HTML object>
```

```
---------------------------------------------------------------------------
AttributeError                            Traceback (most recent call last)
<ipython-input-7-6a4cdb957672> in <module>
      5
      6 # Plot learning rate finder
----> 7 lr_find_res.plot()
      8
      9 # Get the learning rates and losses

AttributeError: 'SuggestedLRs' object has no attribute 'plot'
```
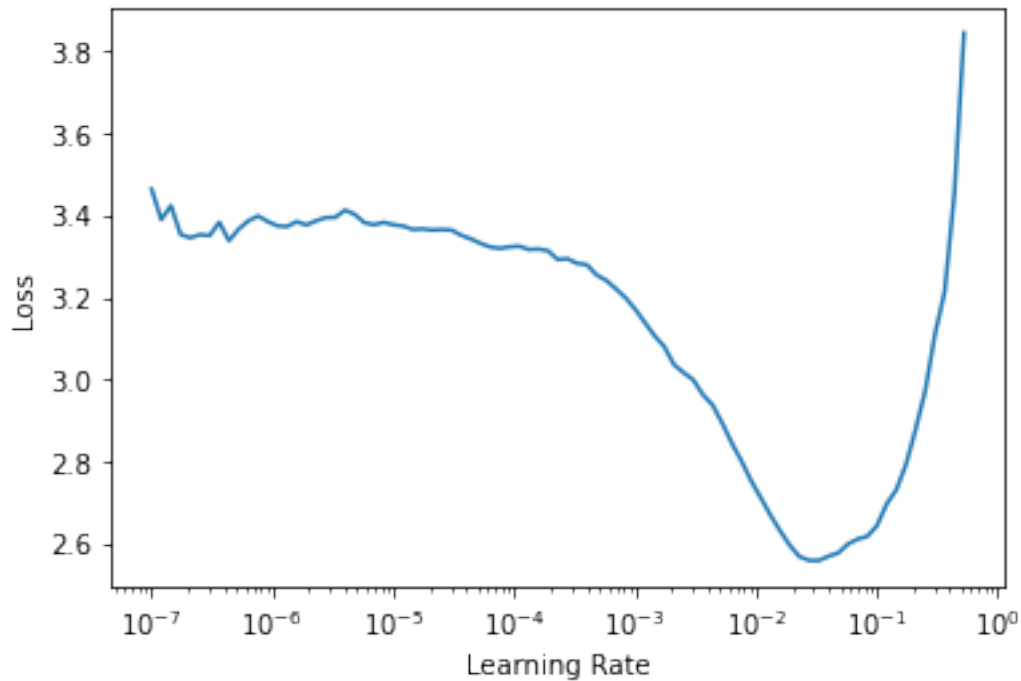


```
[8]: learn.recorder.plot_lr_find()
```

```
[11]: lrs = learn.recorder.lrs
      losses = learn.recorder.losses

      # Find learning rate with minimum loss
      lr_min = lrs[np.argmin(losses)]

      # Find steepest point
      lr_steep = lrs[np.gradient(losses).argmax()]

      print(f"Minimum/10: {lr_min:.2e}, steepest point: {lr_steep:.2e}")
```

Minimum/10: 3.31e-02, steepest point: 1.32e+00

```
[12]: interp = ClassificationInterpretation.from_learner(learn)

      losses,idxs = interp.top_losses()

      len(dls.valid_ds)==len(losses)==len(idxs)
```
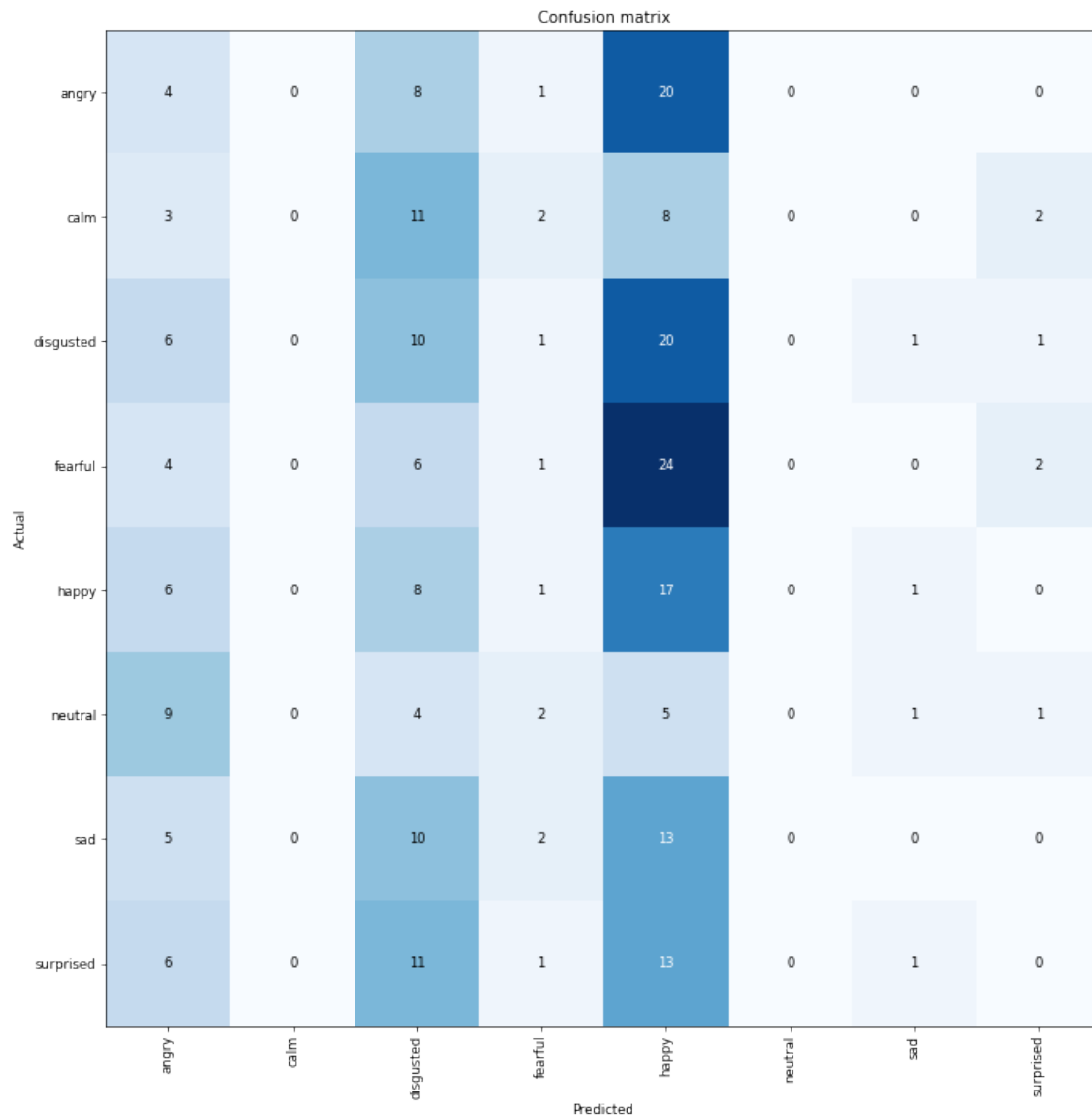
<IPython.core.display.HTML object>

<IPython.core.display.HTML object>

[12]: True

```
[13]: interp.plot_confusion_matrix(figsize=(12,12), dpi=60)
```

```
<IPython.core.display.HTML object>
```

```
<IPython.core.display.HTML object>
```

Confusion matrix

Actual \ Predicted	angry	calm	disgusted	fearful	happy	neutral	sad	surprised
angry	4	0	8	1	20	0	0	0
calm	3	0	11	2	8	0	0	2
disgusted	6	0	10	1	20	0	1	1
fearful	4	0	6	1	24	0	0	2
happy	6	0	8	1	17	0	1	0
neutral	9	0	4	2	5	0	1	1
sad	5	0	10	2	13	0	0	0
surprised	6	0	11	1	13	0	1	0

```
[14]: learn.export('speech.pkl')
```

```
[ ]:
```