```
!pip install pyyaml==5.1

import torch
TORCH_VERSION = ".".join(torch.__version__.split(".")[:2])
CUDA_VERSION = torch.__version__.split("+")[-1]
print("torch: ", TORCH_VERSION, "; cuda: ", CUDA_VERSION)
# Install detectron2 that matches the above pytorch version
# See https://detectron2.readthedocs.io/tutorials/install.html for instructions
!pip install detectron2 -f https://dl.fbaipublicfiles.com/detectron2/wheels/$CUDA_VERSION/tor
# If there is not yet a detectron2 release that matches the given torch + CUDA version, you r
```

```
Collecting pyyaml==5.1
  Downloading PyYAML-5.1.tar.gz (274 kB)
     |████████████████████████████████| 274 kB 5.4 MB/s
Building wheels for collected packages: pyyaml
  Building wheel for pyyaml (setup.py) ... done
  Created wheel for pyyaml: filename=PyYAML-5.1-cp37-cp37m-linux_x86_64.whl size=44092
  Stored in directory: /root/.cache/pip/wheels/77/f5/10/d00a2bd30928b972790053b5de0c703
Successfully built pyyaml
Installing collected packages: pyyaml
  Attempting uninstall: pyyaml
    Found existing installation: PyYAML 3.13
    Uninstalling PyYAML-3.13:
      Successfully uninstalled PyYAML-3.13
Successfully installed pyyaml-5.1
torch:  1.10 ; cuda:  cu111
Looking in links: https://dl.fbaipublicfiles.com/detectron2/wheels/cu111/torch1.10/inde
Collecting detectron2
  Downloading https://dl.fbaipublicfiles.com/detectron2/wheels/cu111/torch1.10/detectro
     |████████████████████████████████| 7.0 MB 759 kB/s
Collecting omegaconf>=2.1
  Downloading omegaconf-2.1.1-py3-none-any.whl (74 kB)
     |████████████████████████████████| 74 kB 2.3 MB/s
Requirement already satisfied: tensorboard in /usr/local/lib/python3.7/dist-packages (f
Requirement already satisfied: pydot in /usr/local/lib/python3.7/dist-packages (from de
Collecting black==21.4b2
  Downloading black-21.4b2-py3-none-any.whl (130 kB)
     |████████████████████████████████| 130 kB 11.1 MB/s
Requirement already satisfied: Pillow>=7.1 in /usr/local/lib/python3.7/dist-packages (f
Requirement already satisfied: pycocotools>=2.0.2 in /usr/local/lib/python3.7/dist-pack
Requirement already satisfied: cloudpickle in /usr/local/lib/python3.7/dist-packages (f
Requirement already satisfied: termcolor>=1.1 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: tabulate in /usr/local/lib/python3.7/dist-packages (from
Collecting iopath<0.1.10,>=0.1.7
  Downloading iopath-0.1.9-py3-none-any.whl (27 kB)
Collecting yacs>=0.1.8
  Downloading yacs-0.1.8-py3-none-any.whl (14 kB)
Requirement already satisfied: tqdm>4.29.0 in /usr/local/lib/python3.7/dist-packages (f
Requirement already satisfied: future in /usr/local/lib/python3.7/dist-packages (from d
Collecting fvcore<0.1.6,>=0.1.5
  Downloading fvcore-0.1.5.post20211023.tar.gz (49 kB)
     |████████████████████████████████| 49 kB 5.6 MB/s
Collecting hydra-core>=1.1
  Downloading hydra_core-1.1.1-py3-none-any.whl (145 kB)
     |████████████████████████████████| 145 kB 38.9 MB/s
Requirement already satisfied: matplotlib in /usr/local/lib/python3.7/dist-packages (fr
Requirement already satisfied: appdirs in /usr/local/lib/python3.7/dist-packages (from
Collecting regex>=2020.1.8
  Downloading regex-2021.11.10-cp37-cp37m-manylinux_2_17_x86_64.manylinux2014_x86_64.wh
     |████████████████████████████████| 749 kB 47.2 MB/s
Collecting mypy-extensions>=0.4.3
  Downloading mypy_extensions-0.4.3-py2.py3-none-any.whl (4.5 kB)
Collecting typed-ast>=1.4.2
  Downloading typed_ast-1.5.0-cp37-cp37m-manylinux_2_5_x86_64.manylinux1_x86_64.manylin
     |████████████████████████████████| 843 kB 26.3 MB/s
Requirement already satisfied: toml>=0.10.1 in /usr/local/lib/python3.7/dist-packages (
Requirement already satisfied: typing-extensions>=3.7.4 in /usr/local/lib/python3.7/dis
Collecting pathspec<1,>=0.8.1
```

```
  Downloading pathspec-0.9.0-py2.py3-none-any.whl (31 kB)
Requirement already satisfied: click>=7.1.2 in /usr/local/lib/python3.7/dist-packages (
Requirement already satisfied: numpy in /usr/local/lib/python3.7/dist-packages (from fv
Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.7/dist-packages (f
Requirement already satisfied: importlib-resources in /usr/local/lib/python3.7/dist-pac
Collecting antlr4-python3-runtime==4.8
  Downloading antlr4-python3-runtime-4.8.tar.gz (112 kB)
     |████████████████████████████████| 112 kB 51.3 MB/s
Collecting portalocker
  Downloading portalocker-2.3.2-py2.py3-none-any.whl (15 kB)
Requirement already satisfied: cython>=0.27.3 in /usr/local/lib/python3.7/dist-packages
Requirement already satisfied: setuptools>=18.0 in /usr/local/lib/python3.7/dist-packag
Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.7/dist-pa
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.7/dist-packa
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.7/dist-packages (
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.1 in /usr/local/l
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (from
Requirement already satisfied: zipp>=3.1.0 in /usr/local/lib/python3.7/dist-packages (f
Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in /usr/local/lib/
Requirement already satisfied: protobuf>=3.6.0 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: absl-py>=0.4 in /usr/local/lib/python3.7/dist-packages (
```

```
import detectron2
from detectron2.utils.logger import setup_logger
setup_logger()

# import some common libraries
import numpy as np
import os, json, cv2, random
from google.colab.patches import cv2_imshow

# import some common detectron2 utilities
from detectron2 import model_zoo
from detectron2.engine import DefaultPredictor
from detectron2.config import get_cfg
from detectron2.utils.visualizer import Visualizer
from detectron2.data import MetadataCatalog, DatasetCatalog
from detectron2.evaluation import PascalVOCDetectionEvaluator
```

```
Requirement already satisfied: fvcore in /usr/local/lib/python3.7/dist-package
Building wheels for collected packages: fvcore, antlr4-python3-runtime
```

```
!wget http://host.robots.ox.ac.uk/pascal/VOC/voc2007/VOCtrainval_06-Nov-2007.tar
!tar -xvf VOCtrainval_06-Nov-2007.tar
```

```
VOCdevkit/VOC2007/SegmentationObject/008722.png
VOCdevkit/VOC2007/SegmentationObject/008747.png
VOCdevkit/VOC2007/SegmentationObject/008764.png
VOCdevkit/VOC2007/SegmentationObject/008801.png
VOCdevkit/VOC2007/SegmentationObject/008815.png
VOCdevkit/VOC2007/SegmentationObject/008927.png
VOCdevkit/VOC2007/SegmentationObject/008932.png
VOCdevkit/VOC2007/SegmentationObject/008944.png
VOCdevkit/VOC2007/SegmentationObject/008948.png
VOCdevkit/VOC2007/SegmentationObject/008973.png
VOCdevkit/VOC2007/SegmentationObject/008980.png
VOCdevkit/VOC2007/SegmentationObject/009015.png
VOCdevkit/VOC2007/SegmentationObject/009068.png
VOCdevkit/VOC2007/SegmentationObject/009209.png
VOCdevkit/VOC2007/SegmentationObject/009221.png
```

```
VOCdevkit/VOC2007/SegmentationObject/009221.png
VOCdevkit/VOC2007/SegmentationObject/009245.png
VOCdevkit/VOC2007/SegmentationObject/009251.png
VOCdevkit/VOC2007/SegmentationObject/009252.png
VOCdevkit/VOC2007/SegmentationObject/009295.png
VOCdevkit/VOC2007/SegmentationObject/009323.png
VOCdevkit/VOC2007/SegmentationObject/009327.png
VOCdevkit/VOC2007/SegmentationObject/009331.png
VOCdevkit/VOC2007/SegmentationObject/009348.png
VOCdevkit/VOC2007/SegmentationObject/009392.png
VOCdevkit/VOC2007/SegmentationObject/009413.png
VOCdevkit/VOC2007/SegmentationObject/009419.png
VOCdevkit/VOC2007/SegmentationObject/009422.png
VOCdevkit/VOC2007/SegmentationObject/009446.png
VOCdevkit/VOC2007/SegmentationObject/009458.png
VOCdevkit/VOC2007/SegmentationObject/009464.png

VOCdevkit/VOC2007/SegmentationObject/009527.png
VOCdevkit/VOC2007/SegmentationObject/009533.png
VOCdevkit/VOC2007/SegmentationObject/009550.png
VOCdevkit/VOC2007/SegmentationObject/009562.png
VOCdevkit/VOC2007/SegmentationObject/009580.png
VOCdevkit/VOC2007/SegmentationObject/009597.png
VOCdevkit/VOC2007/SegmentationObject/009605.png
VOCdevkit/VOC2007/SegmentationObject/009618.png
VOCdevkit/VOC2007/SegmentationObject/009649.png
VOCdevkit/VOC2007/SegmentationObject/009654.png
VOCdevkit/VOC2007/SegmentationObject/009655.png
VOCdevkit/VOC2007/SegmentationObject/009684.png
VOCdevkit/VOC2007/SegmentationObject/009687.png
VOCdevkit/VOC2007/SegmentationObject/009691.png
VOCdevkit/VOC2007/SegmentationObject/009706.png
VOCdevkit/VOC2007/SegmentationObject/009709.png
VOCdevkit/VOC2007/SegmentationObject/009724.png
VOCdevkit/VOC2007/SegmentationObject/009756.png
VOCdevkit/VOC2007/SegmentationObject/009764.png
VOCdevkit/VOC2007/SegmentationObject/009794.png
VOCdevkit/VOC2007/SegmentationObject/009807.png
VOCdevkit/VOC2007/SegmentationObject/009832.png
VOCdevkit/VOC2007/SegmentationObject/009841.png
VOCdevkit/VOC2007/SegmentationObject/009897.png
VOCdevkit/VOC2007/SegmentationObject/009911.png
VOCdevkit/VOC2007/SegmentationObject/009923.png
VOCdevkit/VOC2007/SegmentationObject/009938.png
VOCdevkit/VOC2007/SegmentationObject/009947.png
VOCdevkit/VOC2007/SegmentationObject/009950.png
```

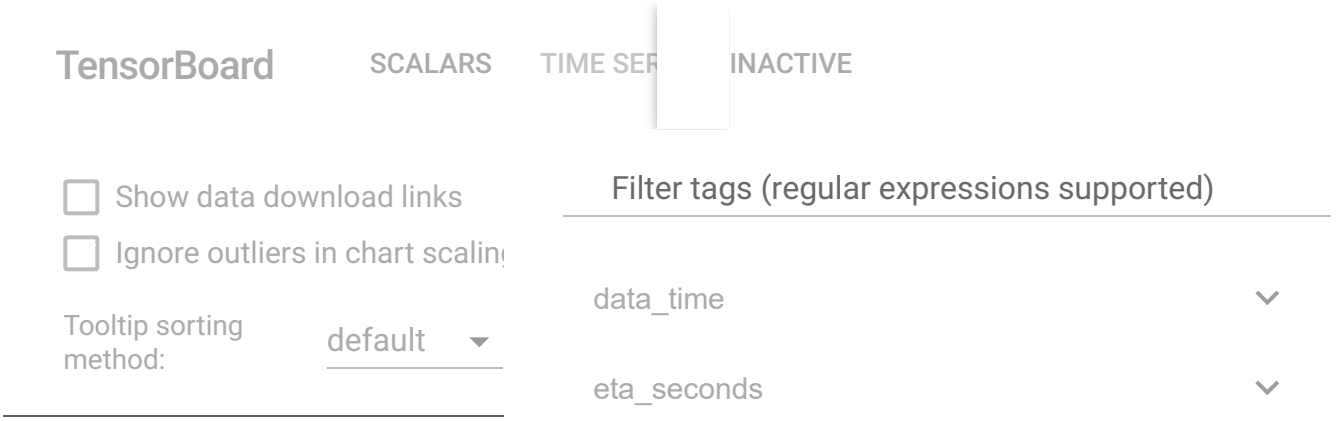
```
!mv VOCdevkit datasets


from detectron2.engine import DefaultTrainer

cfg = get_cfg()
cfg.merge_from_file(model_zoo.get_config_file("COCO-Detection/retinanet_R_50_FPN_3x.yaml"))
cfg.OUTPUT_DIR = 'MyVOCTraining'
cfg.DATASETS.TRAIN = ("voc_2007_train",)
cfg.DATASETS.TEST = ()
```

```
cfg.DATALOADER.NUM_WORKERS = 1
cfg.MODEL.WEIGHTS = model_zoo.get_checkpoint_url("COCO-Detection/retinanet_R_50_FPN_3x.yaml")
cfg.SOLVER.IMS_PER_BATCH = 1
cfg.SOLVER.BASE_LR = 0.0001 # pick a good LR
cfg.SOLVER.MAX_ITER = 3000
cfg.MODEL.ROI_HEADS.BATCH_SIZE_PER_IMAGE = 128
cfg.MODEL.ROI_HEADS.NUM_CLASSES = 20

os.makedirs(cfg.OUTPUT_DIR, exist_ok=True)
trainer = DefaultTrainer(cfg)
trainer.resume_or_load(resume=False)
trainer.train()
```

```
[11/18 20:33:13 d2.utils.events]:  eta: 0:14:08  iter: 1919  total_loss: 0.5091  los
[11/18 20:33:28 d2.utils.events]:  eta: 0:13:52  iter: 1939  total_loss: 0.2309  los
[11/18 20:33:44 d2.utils.events]:  eta: 0:13:35  iter: 1959  total_loss: 0.3787  los
[11/18 20:33:59 d2.utils.events]:  eta: 0:13:19  iter: 1979  total_loss: 0.4733  los
[11/18 20:34:15 d2.utils.events]:  eta: 0:13:04  iter: 1999  total_loss: 0.2636  los
[11/18 20:34:30 d2.utils.events]:  eta: 0:12:48  iter: 2019  total_loss: 0.3307  los
[11/18 20:34:46 d2.utils.events]:  eta: 0:12:31  iter: 2039  total_loss: 0.3108  los
[11/18 20:35:01 d2.utils.events]:  eta: 0:12:15  iter: 2059  total_loss: 0.3146  los
[11/18 20:35:16 d2.utils.events]:  eta: 0:12:00  iter: 2079  total_loss: 0.4217  los
[11/18 20:35:32 d2.utils.events]:  eta: 0:11:45  iter: 2099  total_loss: 0.2993  los
[11/18 20:35:47 d2.utils.events]:  eta: 0:11:28  iter: 2119  total_loss: 0.3754  los
[11/18 20:36:03 d2.utils.events]:  eta: 0:11:11  iter: 2139  total_loss: 0.3669  los
[11/18 20:36:19 d2.utils.events]:  eta: 0:10:54  iter: 2159  total_loss: 0.5506  los
[11/18 20:36:34 d2.utils.events]:  eta: 0:10:41  iter: 2179  total_loss: 0.416  loss
[11/18 20:36:50 d2.utils.events]:  eta: 0:10:26  iter: 2199  total_loss: 0.2713  los
[11/18 20:37:05 d2.utils.events]:  eta: 0:10:10  iter: 2219  total_loss: 0.2383  los
[11/18 20:37:20 d2.utils.events]:  eta: 0:09:53  iter: 2239  total_loss: 0.2838  los
[11/18 20:37:36 d2.utils.events]:  eta: 0:09:37  iter: 2259  total_loss: 0.4469  los
[11/18 20:37:52 d2.utils.events]:  eta: 0:09:22  iter: 2279  total_loss: 0.2978  los
[11/18 20:38:08 d2.utils.events]:  eta: 0:09:06  iter: 2299  total_loss: 0.3353  los
[11/18 20:38:25 d2.utils.events]:  eta: 0:08:52  iter: 2319  total_loss: 0.4355  los
[11/18 20:38:41 d2.utils.events]:  eta: 0:08:37  iter: 2339  total_loss: 0.2347  los
[11/18 20:38:58 d2.utils.events]:  eta: 0:08:22  iter: 2359  total_loss: 0.3628  los
[11/18 20:39:12 d2.utils.events]:  eta: 0:08:06  iter: 2379  total_loss: 0.4204  los
[11/18 20:39:28 d2.utils.events]:  eta: 0:07:51  iter: 2399  total_loss: 0.2305  los
[11/18 20:39:44 d2.utils.events]:  eta: 0:07:36  iter: 2419  total_loss: 0.2895  los
[11/18 20:39:59 d2.utils.events]:  eta: 0:07:19  iter: 2439  total_loss: 0.3893  los
[11/18 20:40:14 d2.utils.events]:  eta: 0:07:04  iter: 2459  total_loss: 0.3144  los
[11/18 20:40:29 d2.utils.events]:  eta: 0:06:48  iter: 2479  total_loss: 0.354  loss
[11/18 20:40:45 d2.utils.events]:  eta: 0:06:33  iter: 2499  total_loss: 0.3286  los
[11/18 20:41:02 d2.utils.events]:  eta: 0:06:18  iter: 2519  total_loss: 0.384  loss
[11/18 20:41:18 d2.utils.events]:  eta: 0:06:02  iter: 2539  total_loss: 0.2953  los
[11/18 20:41:33 d2.utils.events]:  eta: 0:05:47  iter: 2559  total_loss: 0.4076  los
[11/18 20:41:49 d2.utils.events]:  eta: 0:05:31  iter: 2579  total_loss: 0.3293  los
[11/18 20:42:04 d2.utils.events]:  eta: 0:05:15  iter: 2599  total_loss: 0.2555  los

[11/18 20:42:20 d2.utils.events]:  eta: 0:05:00  iter: 2619  total_loss: 0.2009  los
[11/18 20:42:35 d2.utils.events]:  eta: 0:04:43  iter: 2639  total_loss: 0.2147  los
[11/18 20:42:51 d2.utils.events]:  eta: 0:04:28  iter: 2659  total_loss: 0.2838  los
[11/18 20:43:06 d2.utils.events]:  eta: 0:04:12  iter: 2679  total_loss: 0.3142  los
[11/18 20:43:21 d2.utils.events]:  eta: 0:03:56  iter: 2699  total_loss: 0.2127  los
[11/18 20:43:37 d2.utils.events]:  eta: 0:03:40  iter: 2719  total_loss: 0.304  loss
[11/18 20:43:53 d2.utils.events]:  eta: 0:03:24  iter: 2739  total_loss: 0.2223  los
[11/18 20:44:08 d2.utils.events]:  eta: 0:03:09  iter: 2759  total_loss: 0.315  loss
```

```
[11/18 20:44:24 d2.utils.events]:  eta: 0:02:53  iter: 2779  total_loss: 0.2391  los
[11/18 20:44:39 d2.utils.events]:  eta: 0:02:37  iter: 2799  total_loss: 0.4163  los
[11/18 20:44:55 d2.utils.events]:  eta: 0:02:21  iter: 2819  total_loss: 0.2607  los
[11/18 20:45:11 d2.utils.events]:  eta: 0:02:06  iter: 2839  total_loss: 0.2613  los
[11/18 20:45:27 d2.utils.events]:  eta: 0:01:50  iter: 2859  total_loss: 0.2303  los
[11/18 20:45:42 d2.utils.events]:  eta: 0:01:34  iter: 2879  total_loss: 0.294  loss
[11/18 20:45:58 d2.utils.events]:  eta: 0:01:18  iter: 2899  total_loss: 0.1452  los
[11/18 20:46:13 d2.utils.events]:  eta: 0:01:03  iter: 2919  total_loss: 0.2154  los
[11/18 20:46:28 d2.utils.events]:  eta: 0:00:47  iter: 2939  total_loss: 0.3519  los
[11/18 20:46:44 d2.utils.events]:  eta: 0:00:31  iter: 2959  total_loss: 0.2633  los
[11/18 20:47:00 d2.utils.events]:  eta: 0:00:15  iter: 2979  total_loss: 0.3403  los
[11/18 20:47:16 d2.utils.events]:  eta: 0:00:00  iter: 2999  total_loss: 0.249  loss
[11/18 20:47:17 d2.engine.hooks]: Overall training speed: 2998 iterations in 0:39:05
[11/18 20:47:17 d2.engine.hooks]: Total training time: 0:39:07 (0:00:02 on hooks)
```

```
# Look at training curves in tensorboard:
%reload_ext tensorboard
%tensorboard --logdir MyVOCTraining/
```




```
# Inference should use the config with parameters that are used in training
# cfg now already contains everything we've set previously. We changed it a little bit for ir
cfg.MODEL.WEIGHTS = os.path.join(cfg.OUTPUT_DIR, "model_final.pth")  # path to the model we j
cfg.MODEL.ROI_HEADS.SCORE_THRESH_TEST = 0.7   # set a custom testing threshold
predictor = DefaultPredictor(cfg)
```

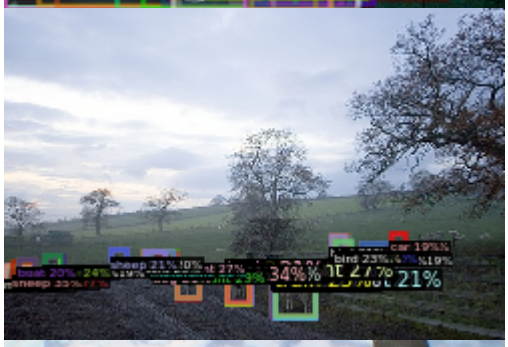
```
from detectron2.evaluation import PascalVOCDetectionEvaluator, inference_on_dataset
from detectron2.data import build_detection_test_loader
evaluator = PascalVOCDetectionEvaluator("voc_2007_val")
val_loader = build_detection_test_loader(cfg, "voc_2007_val")
print(inference_on_dataset(predictor.model, val_loader, evaluator))
```

```
[11/18 20:49:52 d2.data.build]: Distribution of instances among all 20 categories:
|  category   | #instances   |  category   | #instances   |  category  | #instances
|:-----------:|:-------------|:-----------:|:-------------|:----------:|:-----------
|  aeroplane  | 175          |   bicycle   | 216          |    bird    | 305
|    boat     | 190          |   bottle    | 296          |    bus     | 141
|     car     | 818          |     cat     | 198          |   chair    | 706
|     cow     | 171          | diningtable | 162          |    dog     | 267
|    horse    | 199          |  motorbike  | 197          |   person   | 2742
| pottedplant | 320          |    sheep    | 162          |    sofa    | 207
|    train    | 170          |  tvmonitor  | 176          |            |
|    total    | 7818         |             |              |            |
[11/18 20:49:52 d2.data.dataset_mapper]: [DatasetMapper] Augmentations used in infer
[11/18 20:49:52 d2.data.common]: Serializing 2510 elements to byte tensors and conca
[11/18 20:49:52 d2.data.common]: Serialized dataset takes 1.14 MiB
[11/18 20:49:52 d2.evaluation.evaluator]: Start inference on 2510 batches
/usr/local/lib/python3.7/dist-packages/detectron2/structures/image_list.py:88: UserW
  max_size = (max_size + (stride - 1)) // stride * stride
[11/18 20:49:56 d2.evaluation.evaluator]: Inference done 11/2510. Dataloading: 0.001
[11/18 20:50:02 d2.evaluation.evaluator]: Inference done 25/2510. Dataloading: 0.002
[11/18 20:50:07 d2.evaluation.evaluator]: Inference done 39/2510. Dataloading: 0.002
[11/18 20:50:12 d2.evaluation.evaluator]: Inference done 53/2510. Dataloading: 0.002
[11/18 20:50:17 d2.evaluation.evaluator]: Inference done 67/2510. Dataloading: 0.002
[11/18 20:50:22 d2.evaluation.evaluator]: Inference done 81/2510. Dataloading: 0.002
[11/18 20:50:27 d2.evaluation.evaluator]: Inference done 94/2510. Dataloading: 0.002
[11/18 20:50:32 d2.evaluation.evaluator]: Inference done 108/2510. Dataloading: 0.00
[11/18 20:50:37 d2.evaluation.evaluator]: Inference done 122/2510. Dataloading: 0.00
[11/18 20:50:42 d2.evaluation.evaluator]: Inference done 135/2510. Dataloading: 0.00
[11/18 20:50:48 d2.evaluation.evaluator]: Inference done 148/2510. Dataloading: 0.00
```

```
[11/18 20:50:53 d2.evaluation.evaluator]: Inference done 162/2510. Dataloading: 0.00
[11/18 20:50:58 d2.evaluation.evaluator]: Inference done 176/2510. Dataloading: 0.00
[11/18 20:51:03 d2.evaluation.evaluator]: Inference done 190/2510. Dataloading: 0.00
[11/18 20:51:08 d2.evaluation.evaluator]: Inference done 203/2510. Dataloading: 0.00
[11/18 20:51:14 d2.evaluation.evaluator]: Inference done 217/2510. Dataloading: 0.00
[11/18 20:51:19 d2.evaluation.evaluator]: Inference done 231/2510. Dataloading: 0.00
[11/18 20:51:24 d2.evaluation.evaluator]: Inference done 245/2510. Dataloading: 0.00
[11/18 20:51:29 d2.evaluation.evaluator]: Inference done 259/2510. Dataloading: 0.00
[11/18 20:51:35 d2.evaluation.evaluator]: Inference done 273/2510. Dataloading: 0.00
[11/18 20:51:40 d2.evaluation.evaluator]: Inference done 286/2510. Dataloading: 0.00
[11/18 20:51:45 d2.evaluation.evaluator]: Inference done 300/2510. Dataloading: 0.00
[11/18 20:51:50 d2.evaluation.evaluator]: Inference done 314/2510. Dataloading: 0.00
[11/18 20:51:55 d2.evaluation.evaluator]: Inference done 327/2510. Dataloading: 0.00
[11/18 20:52:00 d2.evaluation.evaluator]: Inference done 340/2510. Dataloading: 0.00
[11/18 20:52:05 d2.evaluation.evaluator]: Inference done 354/2510. Dataloading: 0.00
[11/18 20:52:10 d2.evaluation.evaluator]: Inference done 367/2510. Dataloading: 0.00
[11/18 20:52:15 d2.evaluation.evaluator]: Inference done 381/2510. Dataloading: 0.00
[11/18 20:52:21 d2.evaluation.evaluator]: Inference done 395/2510. Dataloading: 0.00
[11/18 20:52:26 d2.evaluation.evaluator]: Inference done 409/2510. Dataloading: 0.00
[11/18 20:52:31 d2.evaluation.evaluator]: Inference done 423/2510. Dataloading: 0.00
[11/18 20:52:36 d2.evaluation.evaluator]: Inference done 437/2510. Dataloading: 0.00
[11/18 20:52:42 d2.evaluation.evaluator]: Inference done 451/2510. Dataloading: 0.00
[11/18 20:52:47 d2.evaluation.evaluator]: Inference done 465/2510. Dataloading: 0.00
[11/18 20:52:52 d2.evaluation.evaluator]: Inference done 479/2510. Dataloading: 0.00
[11/18 20:52:57 d2.evaluation.evaluator]: Inference done 493/2510. Dataloading: 0.00
[11/18 20:53:03 d2.evaluation.evaluator]: Inference done 507/2510. Dataloading: 0.00
[11/18 20:53:08 d2.evaluation.evaluator]: Inference done 521/2510. Dataloading: 0.00
[11/18 20:53:13 d2.evaluation.evaluator]: Inference done 534/2510. Dataloading: 0.00
[11/18 20:53:18 d2.evaluation.evaluator]: Inference done 548/2510. Dataloading: 0.00
```

```
dataset_dicts = detectron2.data.get_detection_dataset_dicts('voc_2007_val')
for d in random.sample(dataset_dicts, 3):
    im = cv2.imread(d["file_name"])
    outputs = predictor(im)  # format is documented at https://detectron2.readthedocs.io/tutc
    v = Visualizer(im[:, :, ::-1],
                   detectron2.data.MetadataCatalog.get('voc_2007_val'),
                   scale=0.5,
                   )
    out = v.draw_instance_predictions(outputs["instances"].to("cpu"))
    cv2_imshow(out.get_image()[:, :, ::-1])
```

```
[11/18 21:17:33 d2.data.build]: Removed 0 images with no usable annotations. 2510 image
/usr/local/lib/python3.7/dist-packages/detectron2/structures/image_list.py:88: UserWarn
  max_size = (max_size + (stride - 1)) // stride * stride
```



✓ 3s completed at 1:17 PM