

Homework-3 Solution report.

Anirudh Iyengar Kaniyar Narayana Iyengar

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- 1) Part 1:
 - a) Publisher

```
root@49af504b34ae:~/ros2_ws# ros2 run hw3 publisher
[INFO] [1678662780.973077114] [publisher]: Publishing: "1"
[INFO] [1678662782.936193034] [publisher]: Publishing: "2"
[INFO] [1678662784.917248483] [publisher]: Publishing: "3"
[INFO] [1678662786.917454919] [publisher]: Publishing: "4"
[INFO] [1678662788.918377477] [publisher]: Publishing: "5"
[INFO] [1678662790.918616076] [publisher]: Publishing: "6"
[INFO] [1678662792.918568113] [publisher]: Publishing: "7"
[INFO] [1678662794.921254985] [publisher]: Publishing: "8"
[INFO] [1678662796.917952256] [publisher]: Publishing: "9"
[INFO] [1678662798.916887266] [publisher]: Publishing: "10"
[INFO] [1678662800.918904921] [publisher]: Publishing: "11"
[INFO] [1678662802.917636142] [publisher]: Publishing: "12"
[INFO] [1678662804.917777192] [publisher]: Publishing: "13"
[INFO] [1678662806.918568369] [publisher]: Publishing: "14"
[INFO] [1678662808.920775005] [publisher]: Publishing: "15"
[INFO] [1678662810.927286361] [publisher]: Publishing: "16"
[INFO] [1678662812.917495506] [publisher]: Publishing: "17"
[INFO] [1678662814.917434448] [publisher]: Publishing: "18"
[INFO] [1678662816.918478374] [publisher]: Publishing: "19"
[INFO] [1678662818.916562708] [publisher]: Publishing: "20"
```

2) Part 2:

a) subscriber.py

```
root@5838792e7e26:~/ros2_ws# ros2 run hw3 subscriber
Downloading: "https://download.pytorch.org/models/maskrcnn_resnet50_fpn_coco-bf2d0c1e.pth" to /root/.cache/torch/hub/checkpoints/maskrcnn_resnet50_fpn_coco-bf2d0c1e.pth
['dog', 'dog', 'cat']
['bird', 'bird', 'bird']
['surfboard', 'airplane', 'surfboard']
['bird', 'apple', 'person']
['carrot', 'broccoli', 'carrot']
['person', 'person', 'person']
['skateboard', 'dog', 'skateboard']
['bird', 'bird', 'bird']
['dog', 'bear', 'bear']
['handbag', 'person', 'teddy bear']
['bird', 'bird', 'broccoli']
['dog', 'sheep', 'horse']
['dog', 'dog', 'chair']
['person', 'dog', 'apple']
['car', 'car', 'person']
['dog', 'chair', 'dog']
['dog']
['car', 'person', 'person']
['bowl', 'person', 'dining table']
['microwave', 'oven', 'clock']
```

b) subscriber_vanilla_resnet.py

```
root@f606a4e9e3b7:~/ros2_ws# ros2 run hw3 subscriber_vanilla
/usr/local/lib/python3.10/dist-packages/torchvision/models/_utils.py:208: UserWarning: The parameter 'pretrained' is deprecated since 0.13 and may be removed in the future, please use 'weights' instead.
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/torchvision/models/_utils.py:223: UserWarning: Arguments other than a weight enum or 'None' for 'weights' are deprecated since 0.13 and may be removed in the future. The current behavior is equivalent to passing 'weights=ResNet50_Weights.IMAGENET1K_V1'. You can also use 'weights=ResNet50_Weights.DEFAULT' to get the most up-to-date weights.
  warnings.warn(msg)
Downloading: "https://download.pytorch.org/models/resnet50-0676ba61.pth" to /root/.cache/torch/hub/checkpoints/resnet50-0676ba61.pth
100.0%
['keeshond']
['car mirror']
['coffee mug']
['digital clock']
['Labrador retriever']
['peacock']
['great white shark']
['electric ray']
['eft']
['triceratops']
['king snake']
['tarantula']
['wallaby']
['chiton']
['dowitcher']
['bluetick']
['Saluki']
['Labrador retriever']
['minivan']
['German shepherd']
['keeshond']
['car mirror']
['coffee mug']
['digital clock']
```

3) Part 3:

a) Ros bag “recordings” to find out the topic name for 599 messages.

```
root@438e456f84958:~/recordings# ros2 bag info rosbag2_2023_02_17-19_39_12_0.db3
closing.
closing.
[INFO] [1678678834.344546745] [rosbag2_storage]: Opened database 'rosbag2_2023_02_17-19_39_12_0.db3' for READ_ONLY.
Files:          rosbag2_2023_02_17-19_39_12_0.db3
Bag size:       1.0 GiB
Storage id:     sqlite3
Duration:       39.975s
Start:          Feb 17 2023 19:39:13.62 (1676662753.62)
End:            Feb 17 2023 19:39:53.38 (1676662793.38)
Messages:       599
Topic information: Topic: /zed/zed_node/right_raw/image_raw_color | Type: sensor_msgs/msg/Image | Count: 599 | Serialization Format: cdr
```

b) subscriber_rosbag.py

```
root@43c645e6233a:~/ros2_ws# ros2 run hw3 subscriber_bag
Downloading: "https://download.pytorch.org/models/maskrcnn_resnet50_fpn_coco-bf2d0c1e.pth" to /root/.cache/torch/hub/checkpoints/maskrcnn_resnet50_fpn_coco-bf2d0c1e.pth
['laptop', 'tv', 'tv']
['laptop', 'laptop', 'tv']
['laptop', 'laptop', 'tv']
['toilet', 'tv', 'tv']
['hair drier', 'tv', 'person']
['mouse', 'hair drier', 'dining table']
['toothbrush', 'person', 'bottle']
['bottle', 'toothbrush', 'sink']
['person', 'cell phone', 'laptop']
['person', 'person', 'keyboard']
['keyboard', 'cell phone', 'tv']
['mouse', 'person', 'person']
['mouse', 'person', 'person']
['person', 'book', 'book']
['keyboard', 'bottle', 'book']
['keyboard', 'book', 'book']
```

c) subscriber_rosbag_vanilla_resnet.py

```
root@500b2691c7f6:~/ros2_ws# ros2 run hw3 subscriber_bag_vanilla
/usr/local/lib/python3.10/dist-packages/torchvision/models/_utils.py:208: UserWarning: The parameter 'pretrained' is deprecated since 0.13 and may be removed in the future, please use 'weights' instead.
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/torchvision/models/_utils.py:223: UserWarning: Arguments other than a weight enum or 'None' for 'weights' are deprecated since 0.13 and may be removed in the future. The current behavior is equivalent to passing 'weights=ResNet50_Weights.IMAGENET1K_V1'. You can also use 'weights=ResNet50_Weights.DEFAULT' to get the most up-to-date weights.
  warnings.warn(msg)
Downloading: "https://download.pytorch.org/models/resnet50-0676ba61.pth" to /root/.cache/torch/hub/checkpoints/resnet50-0676ba61.pth
100.0%
['desktop computer']
['television']
['forklift']
['desktop computer']
['screen']
['desktop computer']
['monitor']
['desktop computer']
['monitor']
['desktop computer']
['desktop computer']
['desktop computer']
['desktop computer']
['monitor']
['desktop computer']
['desktop computer']
['monitor']
['desktop computer']
['television']
['television']
['television']
['television']
['microwave']
['snowplow']
['snowplow']
```

4) Part 3:

a) Ros bag “recordings” to find out the topic name for 970 messages.

```
root@53b009738336:~/recordings# ros2 bag info rosbag2_2023_02_17-20_05_26/rosbag2_2023_02_17-20_05_26_0.db3
closing.
closing.
[INFO] [1678761842.756712676] [rosbag2_storage]: Opened database 'rosbag2_2023_02_17-20_05_26/rosbag2_2023_02_17-20_05_26_0.db3' for READ_ONLY.
Files:          rosbag2_2023_02_17-20_05_26/rosbag2_2023_02_17-20_05_26_0.db3
Bag size:       1.7 GiB
Storage id:     sqlite3
Duration:       64.661s
Start:          Feb 17 2023 20:05:26.323 (1676664326.323)
End:            Feb 17 2023 20:06:30.985 (1676664390.985)
Messages:       970
Topic information: Topic: /zed/zed_node/right_raw/image_raw_color | Type: sensor_msgs/msg/Image | Count: 970 | Serialization Format: cdr
```

b) subscriber_rosbag.py

```
root@5838792e7e26:~/ros2_ws# ros2 run hw3 subscriber_bag
['bottle', 'dining table', 'dining table']
['cell phone', 'toothbrush', 'laptop']
['keyboard', 'tv', 'laptop']
['laptop', 'cell phone', 'microwave']
['keyboard', 'keyboard', 'tv']
['keyboard', 'keyboard', 'tv']
['tv', 'tv', 'laptop']
['tv', 'traffic light', 'tv']
['keyboard', 'cup', 'mouse']
['mouse', 'keyboard', 'keyboard']
['mouse', 'keyboard', 'keyboard']
['tv', 'book', 'book']
```

c) subscriber_rosbag_vanilla_resnet.py

```
root@f606a4e9e3b7:~/ros2_ws# ros2 run hw3 subscriber_bag_vanilla
/usr/local/lib/python3.10/dist-packages/torchvision/models/_utils.py:288: UserWarning: The parameter 'pretrained' is deprecated since 0.13 and may be removed in the future, please use 'weights' instead.
  warnings.warn(
/usr/local/lib/python3.10/dist-packages/torchvision/models/_utils.py:223: UserWarning: Arguments other than a weight enum or 'None' for 'weights' are deprecated since 0.13 and may be removed in the future. The current behavior is equivalent to passing 'weights=ResNet50_Weights.IMAGENET1K_V1'. You can also use 'weights=ResNet50_Weights.DEFAULT' to get the most up-to-date weights.
  warnings.warn(msg)
['water bottle']
['water bottle']
['water bottle']
['water bottle']
['pill bottle']
['lighter']
['lighter']
['lighter']
['pill bottle']
['rubber eraser']
['rubber eraser']
['ballpoint']
['rubber eraser']
['rubber eraser']
['ballpoint']
['ballpoint']
['ballpoint']
['ballpoint']
['ballpoint']
['ballpoint']
['ballpoint']
['television']
['television']
['television']
['television']
['television']
['television']
['television']
```