```
1 #clone darknet
2 !git clone https://github.com/AlexeyAB/darknet
```

```
Cloning into 'darknet'...
remote: Enumerating objects: 14621, done.
remote: Total 14621 (delta 0), reused 0 (delta 0), pack-reused 14621
Receiving objects: 100% (14621/14621), 13.21 MiB | 23.82 MiB/s, done.
Resolving deltas: 100% (9955/9955), done.
```

```
1 from google.colab import drive
2 drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

```
1 #Show all my google drive contents
2 #%cd ..
3 #Symlink
4 !ln -s /content/drive/My\ Drive/ mydrive
5 !ls mydrive/
```

```
 16804914_1086183471504587_676718626_o.jpg
 5thSem_MiniProject_Report.gdoc
 7th_SUM_PRO.gdoc
 8SemSummer
 8thSemSummerProject_Nilotpal.gdoc
 9thSemester_SummerProject_Nilotpal_IRM2016501.gslides
 9thSemester_Thesis_Nilotpal_IRM2016501.gslides
 9thSem_SummerProject_IRM2016501_Nilotpal.gdoc
 9thSem_Thesis_IRM2016501_Nilotpal.gdoc
 acc.gslides
'According to the problem we have to write an efficient algorithm to merge two given
'Adressing Review.docx'
'Adressing Review.odt'
'Algorithm Design_2.gdoc'
 ANN2_ML.drawio
 Annexure_3_Tentative.pdf
 ANN_Perceptron_LogicGates.gdoc
 ANN_XNOR.gdoc
 application_new.gdoc
'A Real-Time Smart City Map.gdoc'
'Assignment_IRM2016501 (1).zip'
'Assignment_IRM2016501 (2).zip'
'Assignment_IRM2016501 (3).zip'
'Assignment_IRM2016501 (4).zip'
 Assignment_IRM2016501.zip
'Assignments on Linear Regression #3'
 Attendance.gsheet
'BAM (1).ipynb'
 BAM.gdoc
 BAM.ipynb
'BH3 Mess Menu.docx'
'BH3 Mess Menu.gdoc'
'Bhopal Smart City Hackathon 2.gdoc'
```

```
'BMI Lab (1).gsite'
'BMI Lab (2).gsite'
'BMI Lab Contact Us.gsite'
'BMI Lab.gsite'
'BMI Lab People.gsite'
'Boxplots Data .gsheet'
 Branch_Nilotpal.gdoc
'B-Table Update.gsheet'
'B.Tech 1st 2016 Section B.pdf'
 chandan.gdoc
 Chapter4.docx
 Chapter4.gdoc
 Chapter5.gdoc
'character_segmentation-master (1).zip'
 character_segmentation-master.zip
 chat_Client.c
'CL-09-Internship-Interview-Conference-Visa-for-Student (1).gdoc'
 CL-09-Internship-Interview-Conference-Visa-for-Student.gdoc
 Classroom
 CM_2-1.pptx
 code_nilotpal.zip
'Colab Notebooks'
'Compilers, Principles, Techniques and Tools.pdf'
 Conclusion_2.gdoc
 CONCLUSION.gdoc
```

```
1 !ls
```

```
darknet  drive  mydrive  sample_data
```

```
1 !cp mydrive/yolov3/yolov3.weights /../content/darknet
```

```
1 #change makefile for gpu and opencv
2 %cd darknet
3 !sed -i 's/OPENCV=0/OPENCV=1/' Makefile
4 !sed -i 's/GPU=0/GPU=1/' Makefile
5 !sed -i 's/CUDNN=0/CUDNN=1/' Makefile
6 !sed -i 's/CUDNN_HALF=0/CUDNN_HALF=1/' Makefile
7
```

```
/content/darknet
```

```
1 #cuda verification
2 !/usr/local/cuda/bin/nvcc --version
```

```
nvcc: NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2019 NVIDIA Corporation
Built on Sun_Jul_28_19:07:16_PDT_2019
Cuda compilation tools, release 10.1, V10.1.243
```

```
1 #build darknet
```

```
2 !make
```

```
./src/blas_kernels.cu(1130): warning: variable "step" was set but never used


./src/blas_kernels.cu(1736): warning: variable "stage_id" was declared but never refe

./src/blas_kernels.cu(1086): warning: variable "out_index" was declared but never ref

./src/blas_kernels.cu(1130): warning: variable "step" was set but never used

./src/blas_kernels.cu(1736): warning: variable "stage_id" was declared but never refe

./src/blas_kernels.cu: In function ‘void backward_shortcut_multilayer_gpu(int, int, i
./src/blas_kernels.cu:1130:5: warning: variable ‘step’ set but not used [-Wunused-but
     int step = 0;
     ^~~~
nvcc -gencode arch=compute_35,code=sm_35 -gencode arch=compute_50,code=[sm_50,compute_
nvcc -gencode arch=compute_35,code=sm_35 -gencode arch=compute_50,code=[sm_50,compute_
./src/dropout_layer_kernels.cu(140): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(245): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(262): warning: variable "block_prob" was declared but

./src/dropout_layer_kernels.cu(140): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(245): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(262): warning: variable "block_prob" was declared but

./src/dropout_layer_kernels.cu(140): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(245): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(262): warning: variable "block_prob" was declared but

./src/dropout_layer_kernels.cu(140): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(245): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(262): warning: variable "block_prob" was declared but

./src/dropout_layer_kernels.cu(140): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(245): warning: variable "cur_scale" was declared but n

./src/dropout_layer_kernels.cu(262): warning: variable "block_prob" was declared but

nvcc -gencode arch=compute_35,code=sm_35 -gencode arch=compute_50,code=[sm_50,compute_
nvcc -gencode arch=compute_35,code=sm_35 -gencode arch=compute_50,code=[sm_50,compute_
./src/network_kernels.cu(364): warning: variable "l" was declared but never reference

./src/network_kernels.cu(364): warning: variable "l" was declared but never reference

./src/network_kernels.cu(364): warning: variable "l" was declared but never reference

./src/network_kernels.cu(364): warning: variable "l" was declared but never reference
```

```
./src/network_kernels.cu(364): warning: variable "l" was declared but never reference
```

```
#getting pretrained weights of coco
#!wget https://pjreddie.com/media/files/yolov3.weights
```

```
# define helper functions
def imShow(path):
  import cv2
  import matplotlib.pyplot as plt
  %matplotlib inline

  image = cv2.imread(path)
  height, width = image.shape[:2]
  resized_image = cv2.resize(image,(3*width, 3*height), interpolation = cv2.INTER_CUBIC)

  fig = plt.gcf()
  fig.set_size_inches(18, 10)
  plt.axis("off")
  plt.imshow(cv2.cvtColor(resized_image, cv2.COLOR_BGR2RGB))
  plt.show()

# use this to upload files
def upload():
  from google.colab import files
  uploaded = files.upload()
  for name, data in uploaded.items():
    with open(name, 'wb') as f:
      f.write(data)
      print ('saved file', name)

# use this to download a file
def download(path):
  from google.colab import files
  files.download(path)
```

```
!pwd
```

```
/content
```

```
!cp /content/mydrive/yolov3/obj.data /content/darknet/data/
!cp /content/mydrive/yolov3/obj.names /content/darknet/data/
!cp /content/mydrive/yolov3/yolov3_obj.cfg /content/darknet
!cp /content/mydrive/yolov3/backup/yolov3_obj_final.weights /content/darknet
```

```
!pwd
```

```
/content
```

```
%cd ..
%cd /content/darknet/
!./darknet detector test data/obj.data yolov3_obj.cfg yolov3_obj_final.weights
```

```
  67 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  68 Shortcut Layer: 65,  wt = 0, wn = 0, outputs:  13 x  13 x1024 0.000 BF
  69 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  70 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  71 Shortcut Layer: 68,  wt = 0, wn = 0, outputs:  13 x  13 x1024 0.000 BF
  72 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  73 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  74 Shortcut Layer: 71,  wt = 0, wn = 0, outputs:  13 x  13 x1024 0.000 BF
  75 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  76 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  77 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  78 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  79 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  80 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  81 conv     18       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x  18 0.006 BF
  82 yolo
[yolo] params: iou loss: mse (2), iou_norm: 0.75, obj_norm: 1.00, cls_norm: 1.00, del
  83 route  79                                       ->   13 x  13 x 512
  84 conv    256       1 x 1/ 1     13 x  13 x 512 ->   13 x  13 x 256 0.044 BF
  85 upsample                 2x    13 x  13 x 256 ->   26 x  26 x 256
  86 route  85 61                                    ->   26 x  26 x 768
  87 conv    256       1 x 1/ 1     26 x  26 x 768 ->   26 x  26 x 256 0.266 BF
  88 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  89 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  90 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  91 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  92 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  93 conv     18       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x  18 0.012 BF
  94 yolo
[yolo] params: iou loss: mse (2), iou_norm: 0.75, obj_norm: 1.00, cls_norm: 1.00, del
  95 route  91                                       ->   26 x  26 x 256

  96 conv    128       1 x 1/ 1     26 x  26 x 256 ->   26 x  26 x 128 0.044 BF
  97 upsample                 2x    26 x  26 x 128 ->   52 x  52 x 128
  98 route  97 36                                    ->   52 x  52 x 384
  99 conv    128       1 x 1/ 1     52 x  52 x 384 ->   52 x  52 x 128 0.266 BF
 100 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
 101 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
 102 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
 103 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
 104 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
 105 conv     18       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x  18 0.025 BF
 106 yolo
[yolo] params: iou loss: mse (2), iou_norm: 0.75, obj_norm: 1.00, cls_norm: 1.00, del
Total BFLOPS 65.304
avg_outputs = 516723
 Allocate additional workspace_size = 52.43 MB
Loading weights from yolov3_obj_final.weights...
 seen 64, trained: 256 K-images (4 Kilo-batches_64)
Done! Loaded 107 layers from weights-file
Enter Image Path: /content/mydrive/yolov3/t3.jpeg
 Detection layer: 82 - type = 28
```

```
 Detection layer: 82 - type = 28
 Detection layer: 94 - type = 28
 Detection layer: 106 - type = 28
/content/mydrive/yolov3/t3.jpeg: Predicted in 27.036000 milli-seconds.
Weapon: 83%
Weapon: 71%
Weapon: 61%
Unable to init server: Could not connect: Connection refused
```

```
1 !./darknet detector map data/obj.data yolov3_obj.cfg yolov3_obj_final.weights
```

```
 CUDA-version: 10010 (10010), cuDNN: 7.6.5, CUDNN_HALF=1, GPU count: 1
 CUDNN_HALF=1
 OpenCV version: 3.2.0
 0 : compute_capability = 750, cudnn_half = 1, GPU: Tesla T4
net.optimized_memory = 0
mini_batch = 1, batch = 16, time_steps = 1, train = 0
   layer   filters  size/strd(dil)      input                output
   0 conv     32       3 x 3/ 1    416 x 416 x   3 ->  416 x 416 x  32 0.299 BF
   1 conv     64       3 x 3/ 2    416 x 416 x  32 ->  208 x 208 x  64 1.595 BF
   2 conv     32       1 x 1/ 1    208 x 208 x  64 ->  208 x 208 x  32 0.177 BF
   3 conv     64       3 x 3/ 1    208 x 208 x  32 ->  208 x 208 x  64 1.595 BF
   4 Shortcut Layer: 1,  wt = 0, wn = 0, outputs: 208 x 208 x  64 0.003 BF
   5 conv    128       3 x 3/ 2    208 x 208 x  64 ->  104 x 104 x 128 1.595 BF
   6 conv     64       1 x 1/ 1    104 x 104 x 128 ->  104 x 104 x  64 0.177 BF
   7 conv    128       3 x 3/ 1    104 x 104 x  64 ->  104 x 104 x 128 1.595 BF
   8 Shortcut Layer: 5,  wt = 0, wn = 0, outputs: 104 x 104 x 128 0.001 BF
   9 conv     64       1 x 1/ 1    104 x 104 x 128 ->  104 x 104 x  64 0.177 BF
  10 conv    128       3 x 3/ 1    104 x 104 x  64 ->  104 x 104 x 128 1.595 BF
  11 Shortcut Layer: 8,  wt = 0, wn = 0, outputs: 104 x 104 x 128 0.001 BF
  12 conv    256       3 x 3/ 2    104 x 104 x 128 ->   52 x  52 x 256 1.595 BF
  13 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  14 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  15 Shortcut Layer: 12,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  16 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  17 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  18 Shortcut Layer: 15,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  19 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  20 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  21 Shortcut Layer: 18,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  22 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  23 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  24 Shortcut Layer: 21,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  25 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  26 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  27 Shortcut Layer: 24,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  28 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  29 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  30 Shortcut Layer: 27,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  31 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  32 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  33 Shortcut Layer: 30,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  34 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  35 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  36 Shortcut Layer: 33,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  37 conv    512       3 x 3/ 2     52 x  52 x 256 ->   26 x  26 x 512 1.595 BF
```

```
 38 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
 39 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
 40 Shortcut Layer: 37,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
 41 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
 42 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
 43 Shortcut Layer: 40,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
 44 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
 45 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
 46 Shortcut Layer: 43,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
 47 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
 48 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
 49 Shortcut Layer: 46,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
 50 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
```

```
1 #test compiled darknet using image from drive
2
3 %cd darknet/
4 !./darknet detect /../content/mydrive/yolov3/yolov3_obj.cfg /../content/mydrive/yolov3/bac
5 imShow('predictions.jpg')
```

```
[Errno 20] Not a directory: 'darknet/'
/content/darknet
 CUDA-version: 10010 (10010), cuDNN: 7.6.5, CUDNN_HALF=1, GPU count: 1
 CUDNN_HALF=1
 OpenCV version: 3.2.0
 0 : compute_capability = 750, cudnn_half = 1, GPU: Tesla T4
net.optimized_memory = 0
mini_batch = 1, batch = 16, time_steps = 1, train = 0
   layer   filters  size/strd(dil)      input                output
   0 conv     32       3 x 3/ 1    416 x 416 x   3 ->  416 x 416 x  32 0.299 BF
   1 conv     64       3 x 3/ 2    416 x 416 x  32 ->  208 x 208 x  64 1.595 BF
   2 conv     32       1 x 1/ 1    208 x 208 x  64 ->  208 x 208 x  32 0.177 BF
   3 conv     64       3 x 3/ 1    208 x 208 x  32 ->  208 x 208 x  64 1.595 BF
   4 Shortcut Layer: 1,  wt = 0, wn = 0, outputs: 208 x 208 x  64 0.003 BF
   5 conv    128       3 x 3/ 2    208 x 208 x  64 ->  104 x 104 x 128 1.595 BF
   6 conv     64       1 x 1/ 1    104 x 104 x 128 ->  104 x 104 x  64 0.177 BF
   7 conv    128       3 x 3/ 1    104 x 104 x  64 ->  104 x 104 x 128 1.595 BF
   8 Shortcut Layer: 5,  wt = 0, wn = 0, outputs: 104 x 104 x 128 0.001 BF
   9 conv     64       1 x 1/ 1    104 x 104 x 128 ->  104 x 104 x  64 0.177 BF
  10 conv    128       3 x 3/ 1    104 x 104 x  64 ->  104 x 104 x 128 1.595 BF
  11 Shortcut Layer: 8,  wt = 0, wn = 0, outputs: 104 x 104 x 128 0.001 BF
  12 conv    256       3 x 3/ 2    104 x 104 x 128 ->   52 x  52 x 256 1.595 BF
  13 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  14 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  15 Shortcut Layer: 12,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  16 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  17 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  18 Shortcut Layer: 15,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  19 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  20 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  21 Shortcut Layer: 18,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  22 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  23 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  24 Shortcut Layer: 21,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  25 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  26 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  27 Shortcut Layer: 24,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  28 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  29 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  30 Shortcut Layer: 27,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  31 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  32 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  33 Shortcut Layer: 30,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  34 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
  35 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
  36 Shortcut Layer: 33,  wt = 0, wn = 0, outputs:  52 x  52 x 256 0.001 BF
  37 conv    512       3 x 3/ 2     52 x  52 x 256 ->   26 x  26 x 512 1.595 BF
  38 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  39 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  40 Shortcut Layer: 37,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  41 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  42 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  43 Shortcut Layer: 40,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  44 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  45 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  46 Shortcut Layer: 43,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  47 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
```

```
  48 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  49 Shortcut Layer: 46,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  50 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  51 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  52 Shortcut Layer: 49,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  53 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  54 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  55 Shortcut Layer: 52,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  56 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  57 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  58 Shortcut Layer: 55,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  59 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  60 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  61 Shortcut Layer: 58,  wt = 0, wn = 0, outputs:  26 x  26 x 512 0.000 BF
  62 conv   1024       3 x 3/ 2     26 x  26 x 512 ->   13 x  13 x1024 1.595 BF
  63 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  64 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  65 Shortcut Layer: 62,  wt = 0, wn = 0, outputs:  13 x  13 x1024 0.000 BF
  66 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  67 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  68 Shortcut Layer: 65,  wt = 0, wn = 0, outputs:  13 x  13 x1024 0.000 BF
  69 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  70 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  71 Shortcut Layer: 68,  wt = 0, wn = 0, outputs:  13 x  13 x1024 0.000 BF
  72 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  73 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  74 Shortcut Layer: 71,  wt = 0, wn = 0, outputs:  13 x  13 x1024 0.000 BF
  75 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  76 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  77 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  78 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  79 conv    512       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x 512 0.177 BF
  80 conv   1024       3 x 3/ 1     13 x  13 x 512 ->   13 x  13 x1024 1.595 BF
  81 conv     18       1 x 1/ 1     13 x  13 x1024 ->   13 x  13 x  18 0.006 BF
  82 yolo
[yolo] params: iou loss: mse (2), iou_norm: 0.75, obj_norm: 1.00, cls_norm: 1.00, delta_
  83 route  79                                       ->   13 x  13 x 512
  84 conv    256       1 x 1/ 1     13 x  13 x 512 ->   13 x  13 x 256 0.044 BF
  85 upsample                2x    13 x  13 x 256 ->   26 x  26 x 256
  86 route  85 61                                    ->   26 x  26 x 768
  87 conv    256       1 x 1/ 1     26 x  26 x 768 ->   26 x  26 x 256 0.266 BF
  88 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  89 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  90 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  91 conv    256       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x 256 0.177 BF
  92 conv    512       3 x 3/ 1     26 x  26 x 256 ->   26 x  26 x 512 1.595 BF
  93 conv     18       1 x 1/ 1     26 x  26 x 512 ->   26 x  26 x  18 0.012 BF
  94 yolo
[yolo] params: iou loss: mse (2), iou_norm: 0.75, obj_norm: 1.00, cls_norm: 1.00, delta_
  95 route  91                                       ->   26 x  26 x 256
  96 conv    128       1 x 1/ 1     26 x  26 x 256 ->   26 x  26 x 128 0.044 BF
  97 upsample                2x    26 x  26 x 128 ->   52 x  52 x 128
  98 route  97 36                                    ->   52 x  52 x 384
  99 conv    128       1 x 1/ 1     52 x  52 x 384 ->   52 x  52 x 128 0.266 BF
 100 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
 101 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
 102 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
 103 conv    128       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x 128 0.177 BF
```

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 104 conv    256       3 x 3/ 1     52 x  52 x 128 ->   52 x  52 x 256 1.595 BF
 105 conv     18       1 x 1/ 1     52 x  52 x 256 ->   52 x  52 x  18 0.025 BF
 106 yolo
[yolo] params: iou loss: mse (2), iou_norm: 0.75, obj_norm: 1.00, cls_norm: 1.00, delta_
Total BFLOPS 65.304
avg_outputs = 516723
```

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