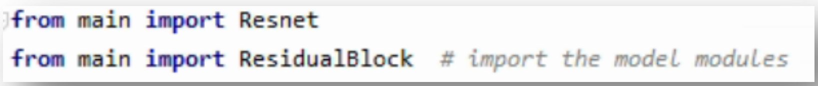
预测

一、方式：

1. 加载已经训练好的模型参数（快速，可微调网络）
2. 加载已经训练好的模型（太大）

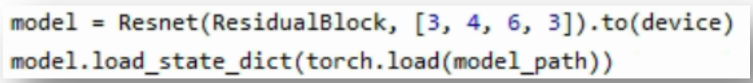
二、步骤（导入模型参数）

Step 1: 把训练网络中定义的网络以模块的形式导入到测试的 py 文件中



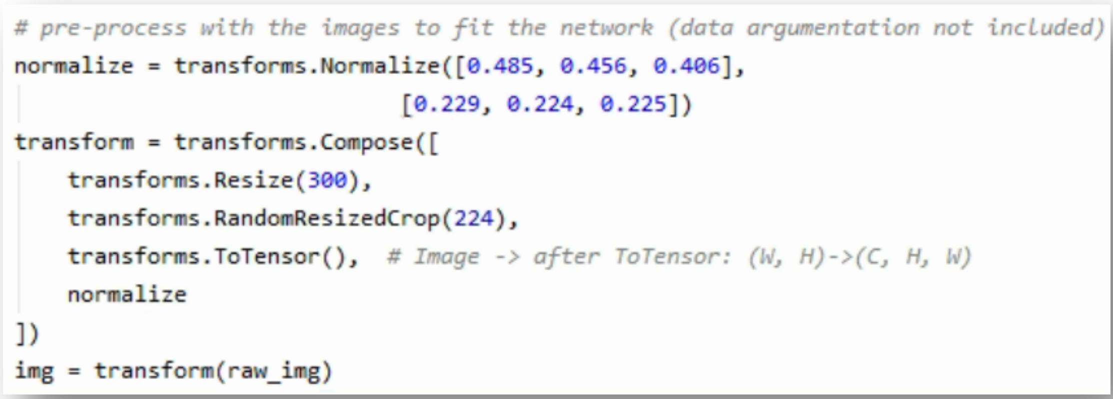
```python
from main import Resnet
from main import ResidualBlock  # import the model modules
```

Step 2: 导入模型参数，实例化网络类，进入 eval()模式，不参与梯度更新



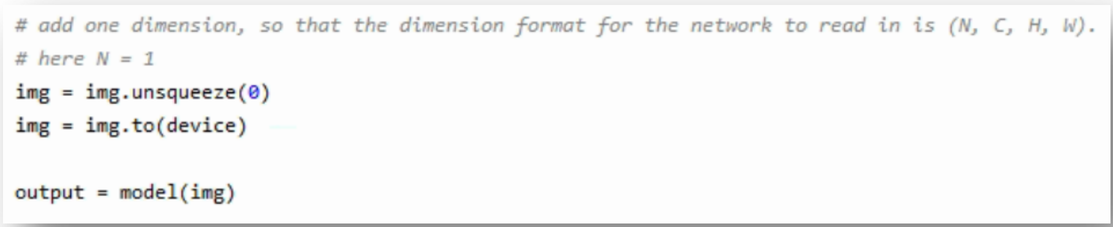
```python
model = Resnet(ResidualBlock, [3, 4, 6, 3]).to(device)
model.load_state_dict(torch.load(model_path))
```

Step 3: 读入图像对原图进行预处理（resize，normalize, ToTensor 等），使图像能适合网络的输入大小，但不进行数据增强（random horizontal flip 等）



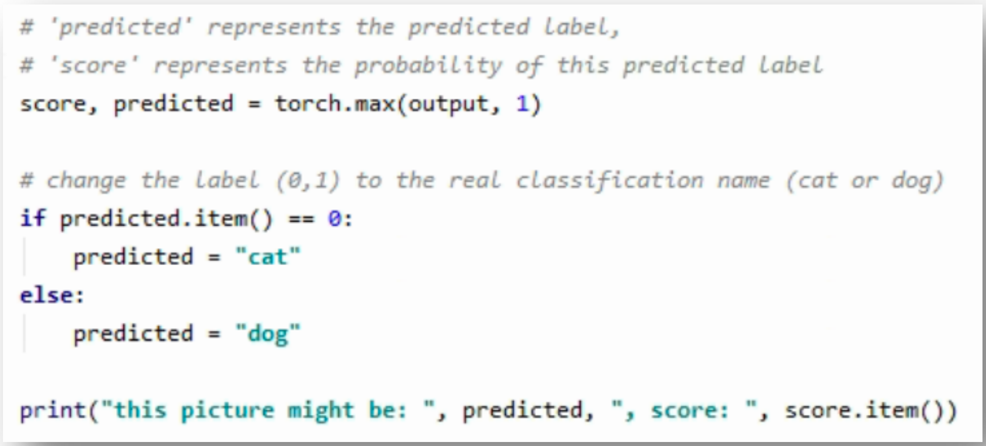
```python
# pre-process with the images to fit the network (data argumentation not included)
normalize = transforms.Normalize([0.485, 0.456, 0.406],
                                 [0.229, 0.224, 0.225])
transform = transforms.Compose([
    transforms.Resize(300),
    transforms.RandomResizedCrop(224),
    transforms.ToTensor(),  # Image -> after ToTensor: (W, H)->(C, H, W)
    normalize
])
img = transform(raw_img)
```

Step 4: 把图像增加一个维度（从(C, H, W)变成(N, C, H, W)），开始预测



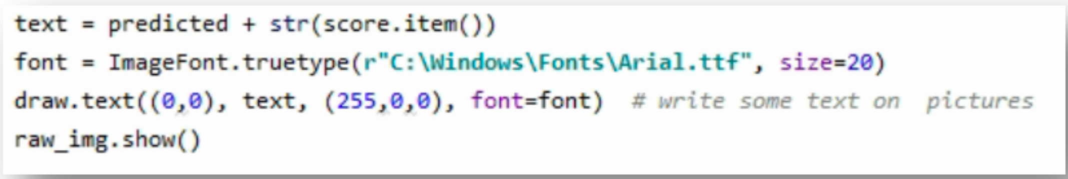
```python
# add one dimension, so that the dimension format for the network to read in is (N, C, H, W).
# here N = 1
img = img.unsqueeze(0)
img = img.to(device)

output = model(img)
```

Step 5: 返回预测的标签和概率，同时把标签转换为分类名



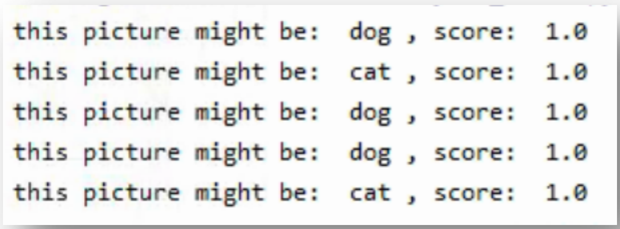
```python
# 'predicted' represents the predicted label,
# 'score' represents the probability of this predicted label
score, predicted = torch.max(output, 1)

# change the label (0,1) to the real classification name (cat or dog)
if predicted.item() == 0:
    predicted = "cat"
else:
    predicted = "dog"

print("this picture might be: ", predicted, ", score: ", score.item())
```

Step 6: 将预测的分类名和概率写在图上



```python
text = predicted + str(score.item())
font = ImageFont.truetype(r"C:\Windows\Fonts\Arial.ttf", size=20)
draw.text((0,0), text, (255,0,0), font=font)  # write some text on  pictures
raw_img.show()
```

三、预测结果



```
this picture might be:  dog , score:  1.0
this picture might be:  cat , score:  1.0
this picture might be:  dog , score:  1.0
this picture might be:  dog , score:  1.0
this picture might be:  cat , score:  1.0
```