Research Plan

1) evaluate the power consumption of our android app for image classification.
2) train your own CNN models(MobileNet) using tensorflow and port them into our android app.

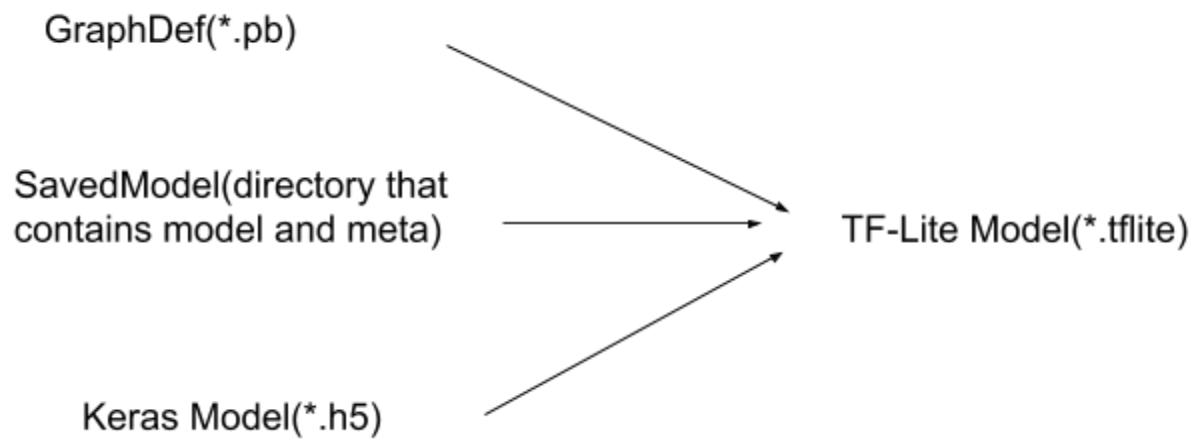
Power Evaluation

To complete the first task, you have to learn basic android programming and use android devices and power evaluation app called PowerTutor to do it, some useful tips:

1) Android Dev Guide: https://developer.android.com/guide/
2) Read the whole code that we packed for you to learn the pipeline.
3) Install PowerTutor App and used it
4) write some code and logics to test power consumption (for example, write a for loop, running it 1000 times, then calculate the power consumption and get the average of inference time for every one run), Java is suggested to be used in the project.

Training Models using Tensorflow

The second task is to develop our own model, then deploy it on our android devices. The pipeline is like this:



This task is a little bit complicated and should be devided into several stages:

1) train a tensorflow model like MobileNet on our own dataset(*.ckpt)
2) convert this trained model into mobile format(*.pb, *.tflite)
3) use the mobile format model and Android App, do image classification on mobile devices.

We expect you to follow this pipeline, first learn how to use tensorflow and use some examples and guidelines to train your own model using MobileNet. Then use some tutorial to convert model and deploy it on android. Some useful tips are as follows:

1) Tensorflow/TF-Lite Guide: https://Tensorflow.org/lite/
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2) MobileNet: https://arxiv.org/abs/1704.04861
3) TF-Slim: https://github.com/tensorflow/models/tree/master/research/slim/nets/mobilenet

There are other extended examples, codes and learning materials in the above links. You can go through them and learn more about it. Learn by doing is the best practice for you to get started.