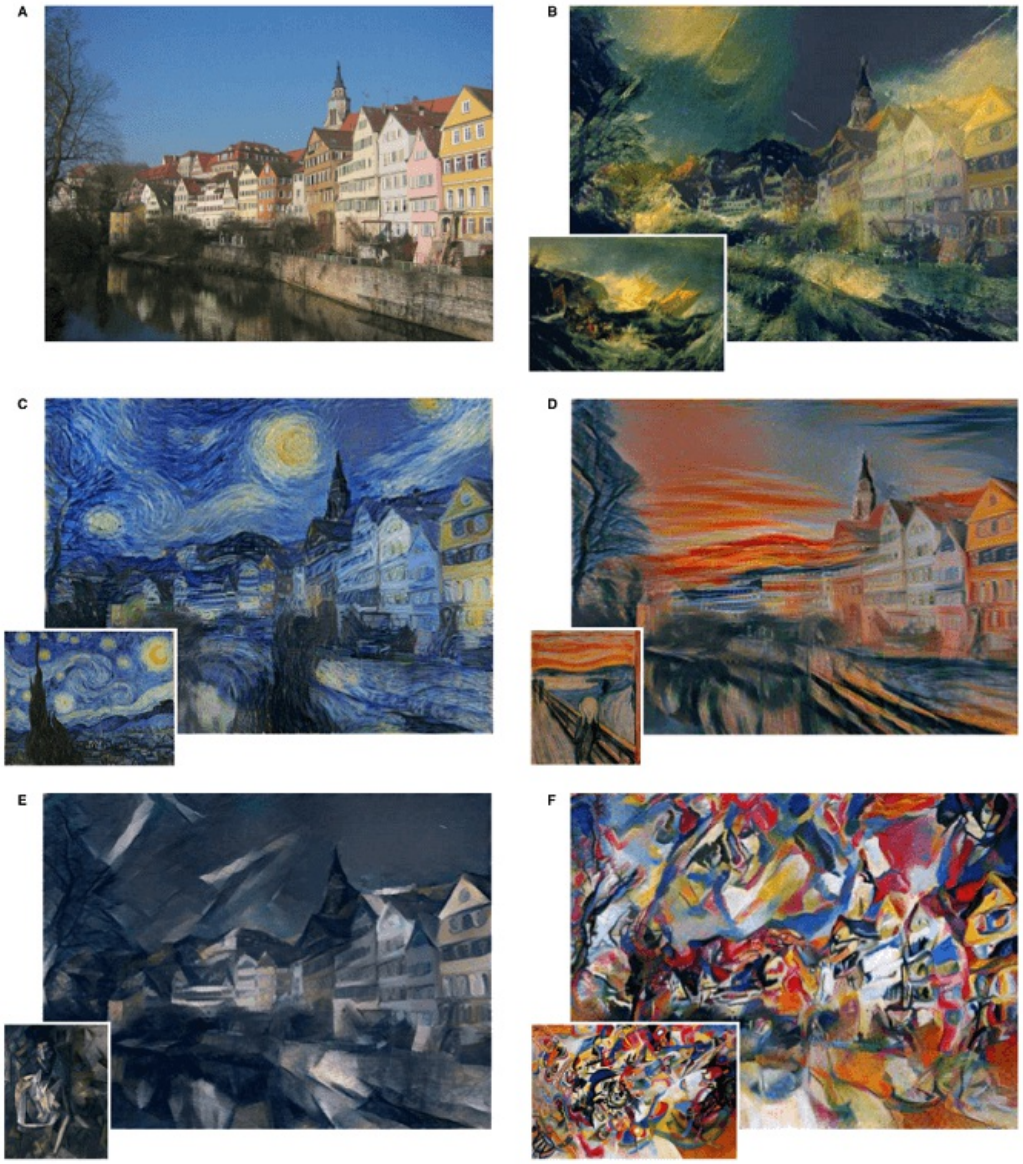
HOMEWORK 3

Welcome to your homework, here are the following are the **rules** of submitting homework:

- You have to submit the code/report in pdf, compiled from markdown. Any report written in word document or so will be discarded and score 0
- You have to submit your homework via Email.
- Your Email subject **MUST be *Course 6125021 Combinatorics+Homework #+{Your Name}+{Your ID}***. For example, if I submit this homework, my Email subject is Course 6125021 Combinatorics Homework 3 徐子晨 1234556678.
- **The Deadline for Homework 3 is Nov. 5th, 11:59PM.**

Question:

1. The 3-Sum problem. Given a integer set S, we would like to know if we name any number say *t*, we can always find three numbers, x, y, and z, which belong to Set S, that *x+y+z=t*. If there exist such three numbers, print x, y, and z, else print ``no found''. You need to provide a Python or Golang code that can solve this 3-sum problem. You also need to create a test code that can randomly generate set S and target t, so that you can test your code at various cases (at least 100 times). Last but not least, you shall write a report on the complexity analysis on your code.
2. Sort the following based on their complexity order n^2, log n, log(log n), log(log n)^2, n^σ, n log n, n^(log n), n!, $\sqrt{n}$, 2^(n^2)
3. Art Style Transfer. Art style transfer is an interesting and long term project in AI. The theme is shown below



Given a set of figures, and target figure, you can always transfer the style from target figure to source files. You are asked to implement an empirical analysis on loss, computing performance, and other possible metrics to evaluate an art style transfer model. You can create the model on your own or use others' code. Make sure you cite others' work when you use their contributions. More specifically, I ask you to do audio transfer instead of image. That is, you transfer the art style from a source audio file to a target style audio. This can be a music, or a song, or some simple RAPs. For example, use the Japanese song ``**Lemon**'' as the source and apply style from your regular singing or any other singer/singeress you like. Write a formal technical report on how you did this and all analysis requirement mentioned above. **NOTE, this report shall be written using Latex, and following the technical report template**