ECE 449/590, Fall 2022
Project 1: NumPy and EasyNN

Due: 09/18 (Sun.), by the end of the day (Chicago time)

1 Summary

In this project, we will implement a few functions in Python to learn the basics of NumPy and EasyNN. NumPy is a popular Python package for scientific computing. It is used in our course projects to create a reference design of our machine learning library EasyNN. As we will discuss in Lecture 3, EasyNN allows us to define and capture a data-flow graph (DFG) in Python to represent a complex computation, e.g. a machine learning algorithm, and to evaluate the DFG with given inputs.

This project should be done individually. Discussions are encouraged. However, all the programs (except those from the lectures) and writings should be by yourself. COPY without proper CITATION will be treated as PLAGIARISM and called for DISCIPLINARY ACTION.

NEVER share your programs/writings with others.

2 Working with Your Projects

Please read *Guide to System Setup and Work Flow* before starting working on your projects and follow instructions there to obtain the initial project package.

Here is a brief introduction of the files we will use for Project 1.

- `easynn.py`: this is the EasyNN library that allows to define and capture DFGs in Python. You should not modify this file.
- `easynn_golden.py`: this is the reference design of the EasyNN library based on NumPy. You should not modify this file.
- `prj01.py`: this file includes 10 Python functions that you need to implement. You will need to modify this file.
- `grade_p1.py`: this is the grading script to locally verify if your implementations in `prj01.py` are correct or not. You should not modify this file.

- `ece449.code-workspace`: this is used by VS Code to locate your project.

Simply run the grading script to see if all functions pass.

```
python3 grade_p1.py
```

Please be advised that all the scripts are provided to you only for your convenience and we will only use the grading report from our CI system to decide your project grade.

3 Deliverables and Grading

We obtain a copy of your source file `prj01.py` as you push the changes to the central Git repository so there is no need for you to submit it to us using any other mechanisms. *Please be advised that since to learn the use of Git and a CI system is among the objectives of this course, we will NOT accept project submissions outside the central Git repository, e.g. via emails.* If you have difficulty accessing the central Git repository (and the CI system), it is your responsibility to act promptly to seek help from us well before the project deadlines; otherwise, not able to access the central Git repository (and the CI system) is NOT an excuse for late submissions.

Project 1 will have a full grade of 100 points. Each function, if passed, will give you 10 points. Since you are required to use the CI system to troubleshoot any issues with your code before the deadline, a failed function will earn 0 points.

The following submission checklist is provided for your convinience. Detailed instructions are available from Section IV of Guide to System Setup and Work Flow.

- ☐ Run `python3 grade_p1.py` in VM to make sure all 10 tests pass.
- ☐ Commit and push your changes to the central Git repository.
- ☐ Run `/home/ece449/show` on uranus.ece.iit.edu to access your grading report and correct any issues before the deadline.