Deep learning & applications

Practice #3-3

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Reference

- Python + Numpy tutorial
  - http://cs231n.github.io/python-numpy-tutorial

Pseudo code for trainset acquisition

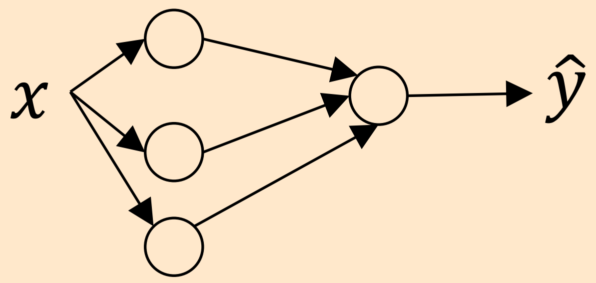
Step. Generate 10000(=m) train samples, 1000(=n) test samples:

```
#import math and random modules
x_train=[], y_train=[]
for i in range(m):
    degree_value = random.uniform(0,360)
    cosine_value = math.cos(math.radians(degree_value))
    x_train.append(degree_value)
    if cosine_value > 0:
        y_train.append(1)
    else:
        y_train.append(0)
x_test=[], y_test=[] #similarly generate 1000 test samples!
```

Task3-3: binary classification using 2-layered net (cross-entropy loss)

Input: 1-dim vector, $\boldsymbol{x}$
Output: label of the input, $\mathbf{y} \in \{0,1\}$

Pseudo code #you can use numpy module!



Step 1. Generated 'm' train samples, 'n' test samples as in **page 3**
Step 2. Update W, b with 'm' samples for 5000 (=K) iterations: #K updates with the grad descent (Thr. = 0.5)
Step 2-1. print W, b every 500 iterations
Step 2-2. calculate the cost on the 'm' train samples!
Step 2-3. calculate the cost with the 'n' test samples!
Step 2-4. print accuracy for the 'm' train samples! (display the number of correctly predicted outputs/m*100)
Step 2-5. print accuracy with the 'n' test samples! (display the number of correctly predicted outputs/n*100)

Report

- You need to submit a short report; (Due: 5/11, 3pm)
  - Format: studentid_name.pdf + single source file (.py or .ipynb)
  - Should not be more than 2 pages
  - Should include
    - Estimated unknown function parameters W & b
    - Empirically determined (best) hyper parameter, α
    - Accuracy (fill in the blanks in the tables below and add them to the report)
    - Discussion (what you've learned in this experiment)

	m=10, n=1000, K=5000	m= 100, n=1000, K=5000	m=10000, n=1000, K=5000
Accuracy (with 'm' train samples)			
Accuracy (with 'n' test samples)			

	m=10000, n=1000, K=10	m=10000, n=1000, K=100	m=10000, n=1000, K=5000
Accuracy (with 'm' train set)			
Accuracy (with 'n' test samples)			