Skills Test: Software Engineer（ML/NLP）

How to submit your test

Please submit your answers as an email attachment (text file) or using GitHub's secret gist function.

Question 1

Mercari monitors its marketplace 24/7/365 for listings with prohibited items.
Suppose that someone in the company created a new algorithm for automatically detecting these prohibited listings.
This algorithm is shown to be 99.9% accurate. It is now your job to evaluate the validity and practicality of the algorithm.
What sort of evaluations do you think are necessary?
Feel free to list up multiple examples if you have more than one, but be sure to order them in terms of priority. Assume that the algorithm itself is implemented correctly and there are no bugs.

Question 2

Suppose an engineer is trying to solve a classification problem.
We managed to obtain accurate results for the training data, however we did not for the test data.
Please list up the possible causes for this problem, and any proposed solutions that you may have.

Question 3

"Deep learning" is a term that is floated around a lot lately, but the idea itself has been around since the 80s or 90s. Why do you think that it has suddenly become such a hot topic again?
Please also give us your thoughts and opinion of deep learning in general to support your answer.

Question 4

Predicting "category_class"

Training data set (train.csv) has following columns:

Column	Description
item_id	unique ID
category_class	item category
sold_price	price when the item is sold
price	price when the item is listed
area_name	where the item is listed
condition	item condition (Fair / Good / Like New)
size	shipping size
listing_at	listing datetime
item_tag_hash	hashed item tag

Testing data set (test.csv) doesn't have the "category_class" column. Let's try to predict the "category_class" of the testing data set.
NOTE: This technical test is using artificially generated training and testing data.

Metric for evaluation

“Mean f1-score”
In python, sklearn.metrics.f1_score can be used.

```
from sklearn.metrics import f1_score
score = f1_score(y, y_pred, average='macro')
```

Submissions

Please submit your prediction results and source code for the prediction through secret gist.
You can use jupyter notebook and it is recommended.

- Correct CSV format for submission like:

```
item_id,category_class
6000,0
5532,4
6797,2
```

- Source code for each process which should include following steps:

```
Data analysis
Feature extraction / Feature engineering
Model training
Model evaluation
Prediction
```