1. Please run python visulized_10.py to get results below

" consumers may want to move their telephones a little closer to the tv set " where
{'move': 0, 'little': 1, 'a': 5, 'set': 2, 'to': 4, 'want': 7, 'their': 3, 'telephones': 8, 'closer': 9, 'the': 6, 'may': 10, 'consumers': 11, 'tv': 12}

" <unk> <unk> watching abc 's monday night football can now vote during <unk> for the greatest play in N years from among four or five <unk> <unk> " where
{'four': 0, 'football': 1, 'for': 2, 'in': 15, 'now': 4, 'five': 5, 'from': 20, 'watching': 13, "'s": 8, 'can': 9, 'during': 10, 'the': 11, 'play': 12, 'among': 7, 'vote': 14, 'greatest': 3, 'N': 19, 'abc': 17, 'night': 18, 'years': 16, '<unk>': 6, 'or': 21, 'monday': 22}

" two weeks ago viewers of several nbc <unk> consumer segments started calling a N number for advice on various <unk> issues " where
{'issues': 8, 'started': 1, 'of': 2, 'several': 3, 'nbc': 4, 'weeks': 5, 'segments': 6, 'two': 7, 'number': 9, 'advice': 10, 'consumer': 11, 'a': 12, 'various': 0, '<unk>': 14, 'for': 16, 'N': 17, 'calling': 19, 'viewers': 18, 'ago': 13, 'on': 15}

" and the new syndicated reality show hard copy records viewers ' opinions for possible airing on the next day 's show " where
{'reality': 0, 'airing': 1, 'next': 13, 'show': 3, 'on': 4, 'hard': 5, 'records': 6, '"': 18, 'and': 7, 'syndicated': 8, 'copy': 12, 'day': 10, 'the': 11, 'opinions': 9, 'new': 14, 'for': 15, "'s": 16, 'viewers': 17, 'possible': 2}

" interactive telephone technology has taken a new leap in <unk> and television programmers are racing to exploit the possibilities " where
{'has': 0, 'possibilities': 1, 'are': 2, 'in': 3, 'taken': 4, 'to': 5, 'telephone': 6, 'and': 7, 'technology': 8, 'television': 9, 'exploit': 10, 'a': 11, 'the': 12, 'new': 13, '<unk>': 14, 'racing': 15, 'programmers': 16, 'leap': 17, 'interactive': 18}

" eventually viewers may grow <unk> with the technology and <unk> the cost " where
{'grow': 0, 'the': 1, 'with': 2, 'may': 5, '<unk>': 4, 'and': 3, 'technology': 6, 'viewers': 7, 'cost': 8, 'eventually': 9}

" but right now programmers are figuring that viewers who are busy dialing up a range of services may put down their <unk> control <unk> and stay <unk> " where
{'now': 1, 'their': 2, 'control': 3, 'and': 0, 'right': 4, 'range': 5, 'put': 6, 'are': 12, 'who': 20, 'viewers': 9, 'busy': 10, 'may': 11, 'of': 7, 'dialing': 13, 'a': 8, 'but': 14, 'down': 15, 'that': 16, 'stay': 17, '<unk>': 18, 'figuring': 19, 'services': 21, 'programmers': 22, 'up': 23}

" we 've been spending a lot of time in los angeles talking to tv production people says mike parks president of call interactive which supplied technology for both abc sports and nbc 's consumer minutes " where
{'for': 1, 'in': 2, 'parks': 24, 'and': 6, 'consumer': 5, "'s": 9, 'supplied': 10, 'time': 11, 'people': 12, 'says': 13, 'president': 14, 'sports': 17, 'a': 16, 'which': 15, 'we': 20, 'spending': 32, 'lot': 18, 'of': 19, 'nbc': 7, 'mike': 21, 'talking': 22, 'to': 23, 'abc': 0, 'technology': 25, 'been': 27, 'production': 26, 'both': 4, 'angeles': 33, 'call': 29, 'tv': 31, 'minutes': 30, "'ve": 8, 'los': 3, 'interactive': 28}

" with the competitiveness of the television market these days everyone is looking for a way to get viewers more excited " where
{'for': 14, 'of': 0, 'to': 1, 'looking': 2, 'get': 3, 'television': 4, 'a': 5, 'everyone': 6, 'the': 7, 'with': 8, 'these': 9, 'is': 17, 'market': 11, 'excited': 13, 'more': 12, 'days': 15, 'viewers': 16, 'competitiveness': 10, 'way': 18}

" one of the leaders behind the expanded use of N numbers is call interactive a joint venture of giants american express co. and american telephone & telegraph co " where
{'leaders': 0, 'american': 1, 'telephone': 2, 'and': 3, 'behind': 9, 'giants': 5, 'the': 6, 'joint': 15, 'venture': 8, 'use': 4, 'telegraph': 10, 'one': 11, 'expanded': 12, 'of': 13, '&': 20, 'co.': 7, 'a': 16, 'numbers': 17, 'N': 18, 'call': 19, 'co': 14, 'express': 21, 'is': 22, 'interactive': 23}

2. To train the model please run:
   python ptb_word_lm.py --data_path=./simple-examples/data/ --model=small --save_path=./checkpoints/

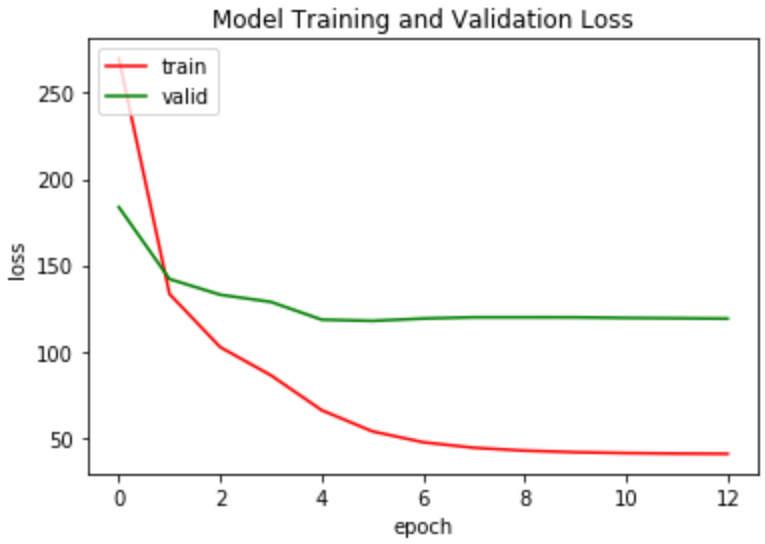

Figure 1. Training Loss against Validation Loss

Comment: the model is good fit at the first epoch. However, it is overfitting after the first epoch.

3.

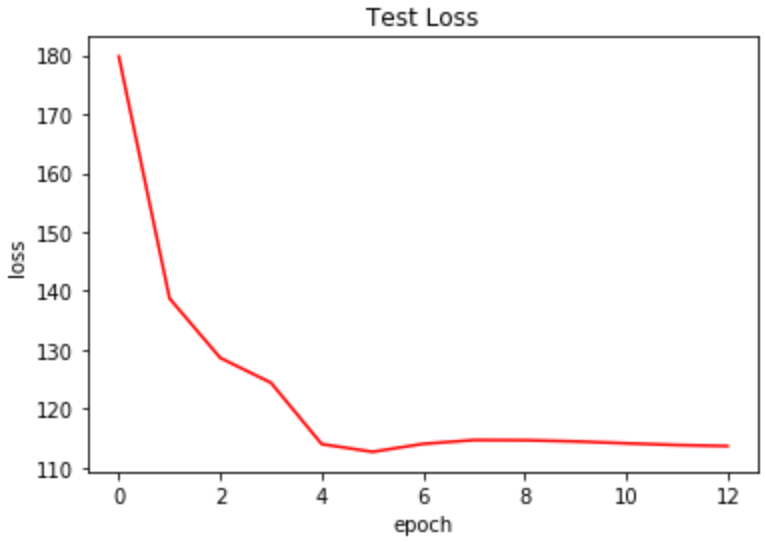

Figure 2. Training Loss against Validation Loss

Comment: compared to results of training and validation, the result of test set seems reasonable because it is smaller than validation. The test loss after 13 is round 113 which is corresponding to 114 indicated by the tutorial.

4. Please run sentence_generator with Jupyter Notebook and it will ask you to input a word.
    - Enter a word to generate a sentence: **consumers**

The output sentence is:
consumers as money limits on their capital base in which while amr corp. members reported that the majority yield were so a winner of the biggest debt market

- Enter a word to generate a sentence: **programmers**
  The output sentence is:
  programmers and entertainment reinsurance in <unk> exporting <unk>
- Enter a word to generate a sentence: **telephone**
  The output sentence is:
  telephone <unk> N N of the <unk> tickets
- Enter a word to generate a sentence: **technology**
  The output sentence is:
  technology politics and other cancers and test abuse
- Enter a word to generate a sentence: **american**
  The output sentence is:
  american <unk> laws the new price and the call in <unk> at star and <unk> at place different intergroup

5.

- Enter a word to generate a sentence: **north**
  The output sentence is:
  north africa similar and send bids during the past three years as a result of a growing effort to <unk> its <unk> line as much as $ N
- Enter a word to generate a sentence: **wall**
  The output sentence is:
  wall street 's political propane <unk> on the british pound
- Enter a word to generate a sentence: **truth**
  The output sentence is:
  truth many of the consequences <unk> the usual 190-point red phenomenon it follows about N <unk> stations
- Enter a word to generate a sentence: **california**
  The output sentence is:
  california no more than N years ago
- Enter a word to generate a sentence: **health**
  The output sentence is:
  health care and quality interests