# Multiask+Concept embedding+ELMO Experiment

## This experiment:

1. extracts the entities in the reviews/needs using dbpedia API,
2. use the microsoft concept extraction API to generate concepts based on the entities
3. concatenate the concept embedding together with the sentence embedding to get results
4. use multitask model to train 5 classes at the same time

The framework reused the multitask framework before with ELMO embeddding.

## Improvement (recall@5) compared to the concept model before:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| class | concept | Multitask+concept | **Multitask+ELMO** | **Multitask+concept+ELMO** |
| gpu | 0.962756052141527 | 0.9851024208566108 | 0.9906890130353817 | 0.9925512104283054 |
| screen | 0.9851024208566108 | 0.994413407821229 | 0.9925512104283054 | 0.9962756052141527 |
| ram | 0.9795158286778398 | 0.9962756052141527 | 0.9962756052141527 | 0.994413407821229 |
| hd | 0.9050279329608939 | 0.9441340782122905 | 0.9441340782122905 | 0.9404096834264432 |
| cpu | 0.776536312849162 | 0.7746741154562383 | 0.8156424581005587 | 0.8249534450651769 |

## Detailed experiment result:

cur\_exp\_param: gpu

ncdg:

0.6201117318435754

0.8659217877094972

0.9093936701715908

0.9233601506185182

0.9361922268367201

precision:

0.6201117318435754

0.4329608938547486

0.3116076970825574

0.24068901303538176

0.1985102420856611

recall:

0.6201117318435754

0.8659217877094972

0.9348230912476723

0.962756052141527

0.9925512104283054

cur\_exp\_param: ram

ncdg:

0.6629422718808193

0.8342644320297952

0.8953600506251695

0.9158442219473297

0.9254682791109812

precision:

0.6629422718808193

0.4171322160148976

0.31036623215394166

0.2430167597765363

0.19888268156424582

recall:

0.6629422718808193

0.8342644320297952

0.931098696461825

0.9720670391061452

0.994413407821229

cur\_exp\_param: hd

ncdg:

0.4506517690875233

0.7262569832402235

0.7920522648044729

0.828365113966484

0.8444052092392362

precision:

0.4506517690875233

0.36312849162011174

0.27684667908131594

0.22579143389199255

0.18808193668528864

recall:

0.4506517690875233

0.7262569832402235

0.8305400372439479

0.9031657355679702

0.9404096834264432

cur\_exp\_param: screen

ncdg:

0.7225325884543762

0.8808193668528864

0.9301658280260737

0.9413390123836156

0.9477550504927166

precision:

0.7225325884543762

0.4404096834264432

0.3196772191185599

0.24534450651769088

0.19925512104283055

recall:

0.7225325884543762

0.8808193668528864

0.9590316573556797

0.9813780260707635

0.9962756052141527

cur\_exp\_param: cpu

ncdg:

0.3333333333333333

0.5325884543761639

0.6136576405892563

0.6611436741088095

0.690817850363401

precision:

0.3333333333333333

0.26629422718808193

0.22036002482929856

0.18901303538175046

0.16499068901303537

recall:

0.3333333333333333

0.5325884543761639

0.6610800744878957

0.7560521415270018

0.8249534450651769