# HAN Experiment by needs text’s length

## Brief introduction:

In this experiment, I split the test data (user generated needs text) into 2 groups: ***long group*** is the top 20% longest needs text, while ***short group*** contains the remaining 80%.

(I’ve also run experiments using other split percentage, like 50%/50%, it seems the results are more or less the same. So I only list the 20%/80% experiment results in the following table).

## Some findings:

In the CPU part, long texts are always better than short text while in HD part, the short texts are always better than long text.

In other types experiments(GPU,Screen,RAM), top-5 PR are nearly the same for long and short group. But in the top-1 or top-2 results, they actually have some gap between long and short group. Sometimes short group are better while sometimes long group are better.

**#### CPU using** HAN

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| **CPU -** HAN | K, number of recommendation | Long needs group | Short needs group |
| Word embeddings | 10 | cur\_exp\_setting: cpu, long  ndcg:  0.35294117647058826  0.6372549019607843  0.6707500811274529  0.6290834144607862  0.6713066064287659  0.6581050005450407  0.6438696678558212  0.6238506949451039  0.5306710775897764  0.5187533362870381  precision:  0.35294117647058826  0.31862745098039214  0.238562091503268  0.22058823529411764  0.19607843137254902  0.20588235294117646  0.19887955182072828  0.19730392156862744  0.22766884531590414  0.24803921568627452  recall:  0.08823529411764706  0.15931372549019607  0.17892156862745098  0.22058823529411764  0.24509803921568626  0.3088235294117647  0.3480392156862745  0.3946078431372549  0.5122549019607843  0.6200980392156863 | cur\_exp\_setting: cpu, short  ndcg:  0.32273838630806845  0.5354523227383863  0.6155952587539328  0.5868666523969647  0.6486545987110898  0.6921637163951705  0.6603189468102616  0.6275110412537792  0.539717438732104  0.5508712288227464  precision:  0.32273838630806845  0.26772616136919314  0.22819885900570497  0.2017114914425428  0.1916870415647922  0.1784841075794621  0.1840726510653161  0.18918092909535453  0.21624558543873948  0.21173594132029339  recall:  0.08068459657701711  0.13386308068459657  0.17114914425427874  0.2017114914425428  0.2396088019559902  0.26772616136919314  0.3221271393643032  0.37836185819070906  0.48655256723716384  0.5293398533007335 |

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| **hard drive** | K, number of recommendation | Long needs group | Short needs group |
| Word embeddings | 5 | cur\_exp\_setting: hd, long  ndcg:  0.38317757009345793  0.7476635514018691  0.837556963284384  0.8578623428738358  0.8468548647551205  precision:  0.38317757009345793  0.397196261682243  0.3364485981308411  0.2967289719626168  0.25794392523364484  recall:  0.19158878504672897  0.397196261682243  0.5046728971962616  0.5934579439252337  0.6448598130841121 | cur\_exp\_setting: hd, short  ndcg:  0.48372093023255813  0.7209302325581395  0.8001059007641267  0.8004247312167836  0.8088984552366562  precision:  0.48372093023255813  0.4313953488372093  0.37751937984496126  0.33372093023255817  0.2813953488372093  recall:  0.24186046511627907  0.4313953488372093  0.5662790697674419  0.6674418604651163  0.7034883720930233 |

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| **Screen Size -** HAN | K, number of recommendation | Long needs group | Short needs group |
| Word embeddings | 5 | cur\_exp\_setting: screen, long  ndcg:  0.7102803738317757  0.8130841121495327  0.8602564301735667  0.8882938133511368  0.9003688570354375  precision:  0.7102803738317757  0.40654205607476634  0.29595015576323985  0.23598130841121495  0.19439252336448598  recall:  0.7102803738317757  0.8130841121495327  0.8878504672897196  0.9439252336448598  0.9719626168224299 | cur\_exp\_setting: screen, short  ndcg:  0.7674418604651163  0.8767441860465116  0.9222298194435242  0.932694935722594  0.9367012292860675  precision:  0.7674418604651163  0.4383720930232558  0.31627906976744186  0.2424418604651163  0.1958139534883721  recall:  0.7674418604651163  0.8767441860465116  0.9488372093023256  0.9697674418604652  0.9790697674418605 |

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| **RAM -** | K, number of recommendation | Long needs group | Short needs group |
| Word embeddings | 5 | cur\_exp\_setting: ram, long  ndcg:  0.7009345794392523  0.8317757009345794  0.9084307177236347  0.9271223065086814  0.931147321070115  precision:  0.7009345794392523  0.4158878504672897  0.3177570093457944  0.24766355140186916  0.2  recall:  0.7009345794392523  0.8317757009345794  0.9532710280373832  0.9906542056074766  1.0 | cur\_exp\_setting: ram, short  ndcg:  0.6255813953488372  0.8162790697674419  0.8852411591112992  0.9119853451578109  0.9189963588938893  precision:  0.6255813953488372  0.40813953488372096  0.3085271317829457  0.24476744186046512  0.19906976744186047  recall:  0.6255813953488372  0.8162790697674419  0.9255813953488372  0.9790697674418605  0.9953488372093023 |

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| **Graphics Card - HAN** | K, number of recommendation | Long needs group | Short needs group |
|  | 5 | cur\_exp\_setting: gpu, long  ndcg:  0.6074766355140186  0.6074766355140186  0.725407430574104  0.814192477303076  0.814192477303076  precision:  0.6074766355140186  0.3037383177570093  0.26479750778816197  0.24299065420560748  0.19439252336448598  recall:  0.6074766355140186  0.6074766355140186  0.794392523364486  0.9719626168224299  0.9719626168224299 | cur\_exp\_setting: gpu, short  ndcg:  0.6302325581395349  0.6441860465116279  0.774773832715953  0.8201226699252554  0.8201226699252554  precision:  0.6302325581395349  0.32209302325581396  0.2837209302325581  0.23546511627906977  0.1883720930232558  recall:  0.6302325581395349  0.6441860465116279  0.8511627906976744  0.9418604651162791  0.9418604651162791 |