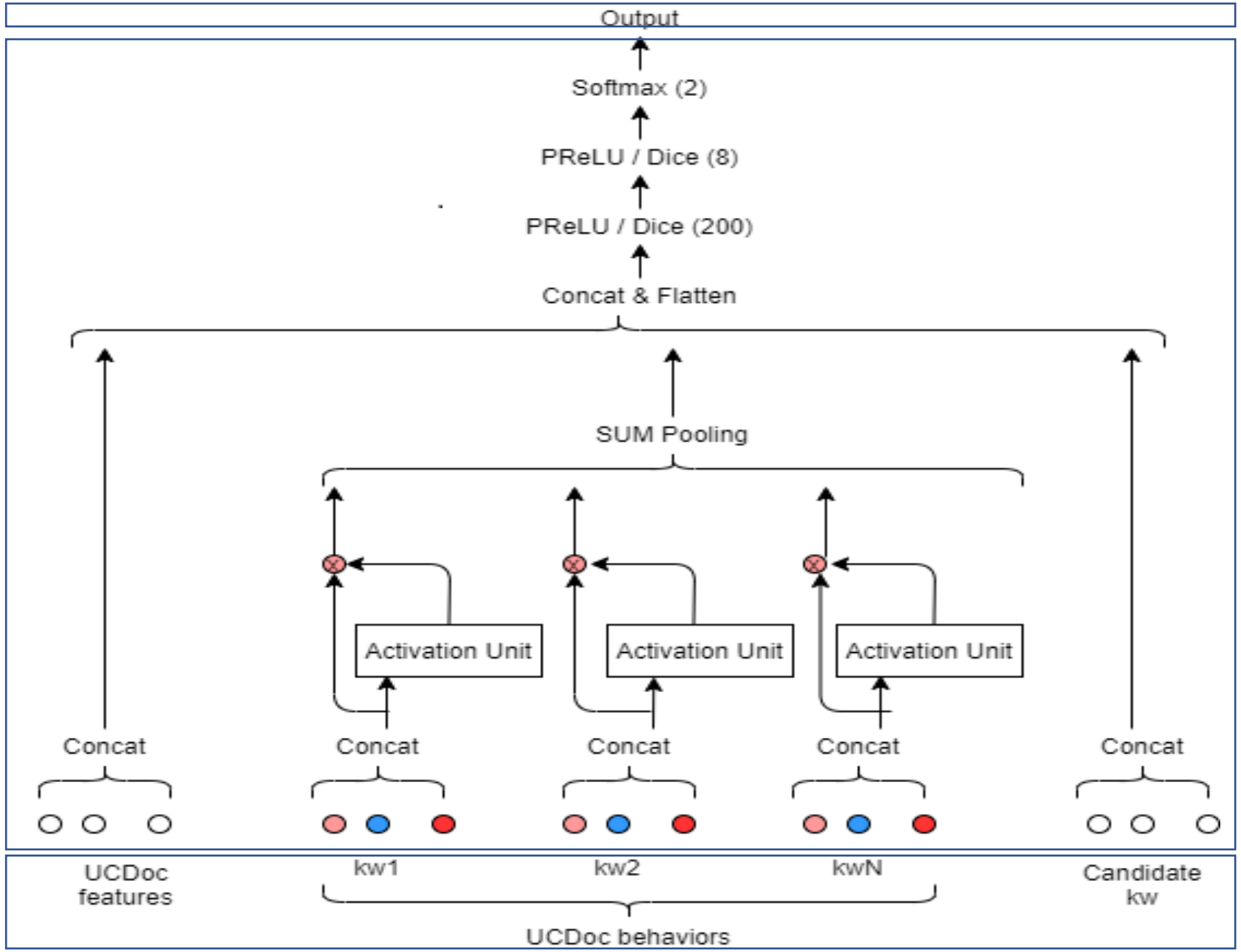
GDIN-model Testing Result Report

GDIN model

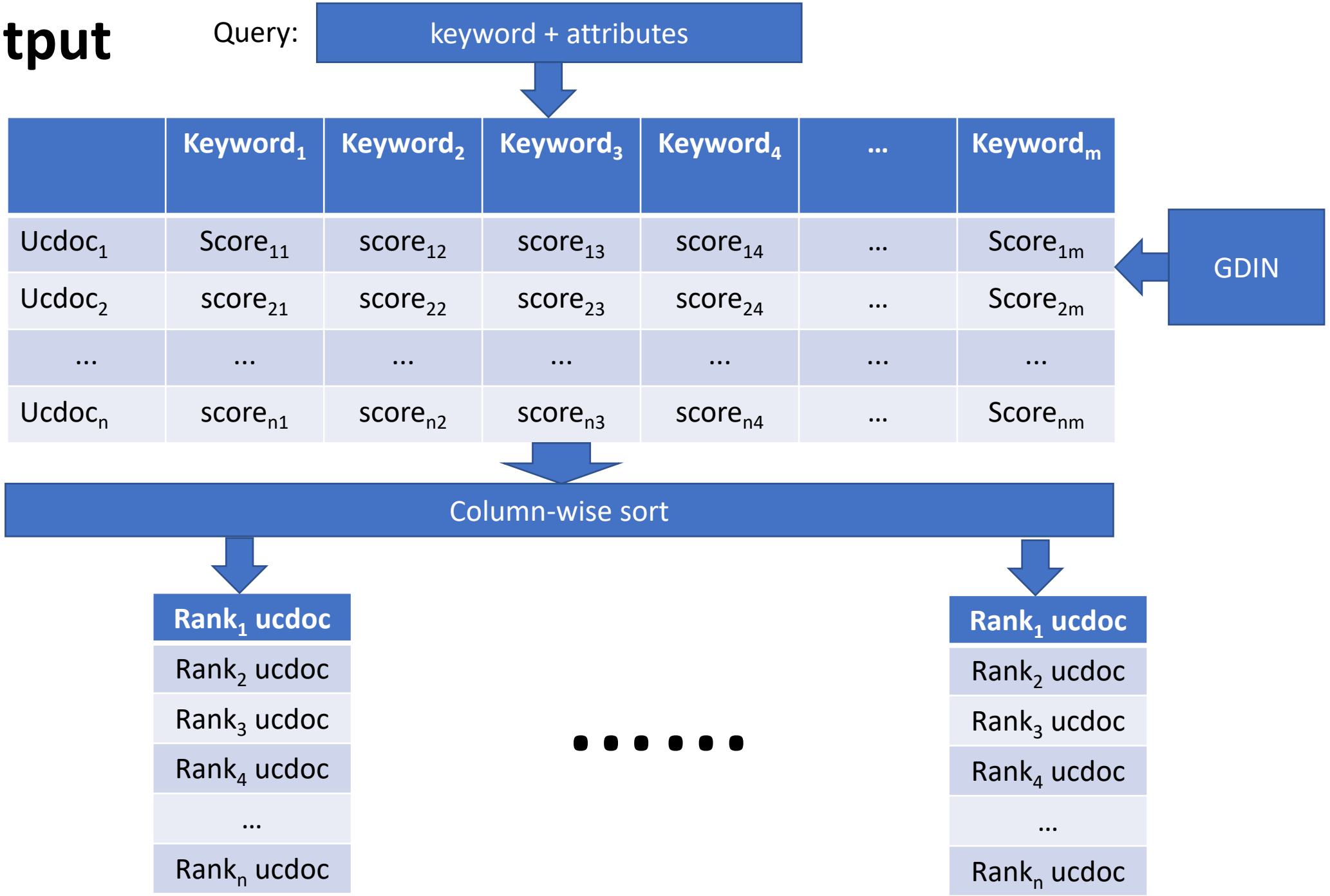
Output

Model

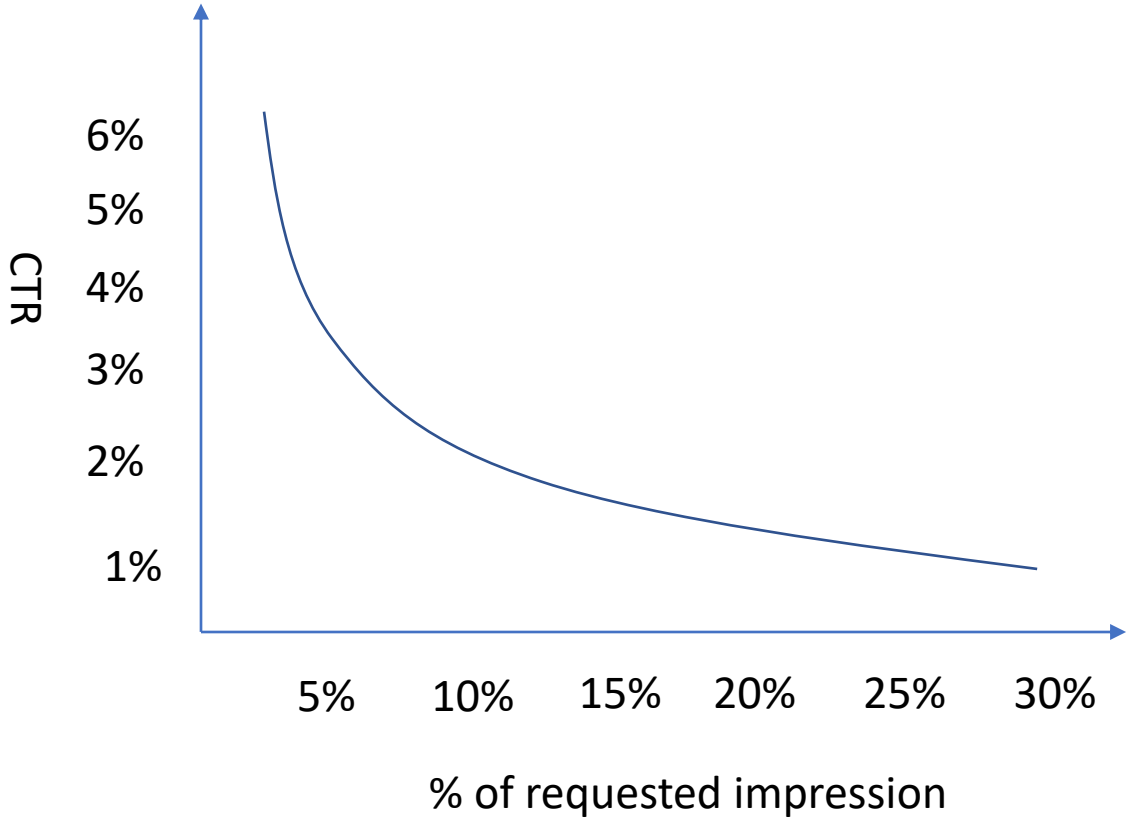
Input

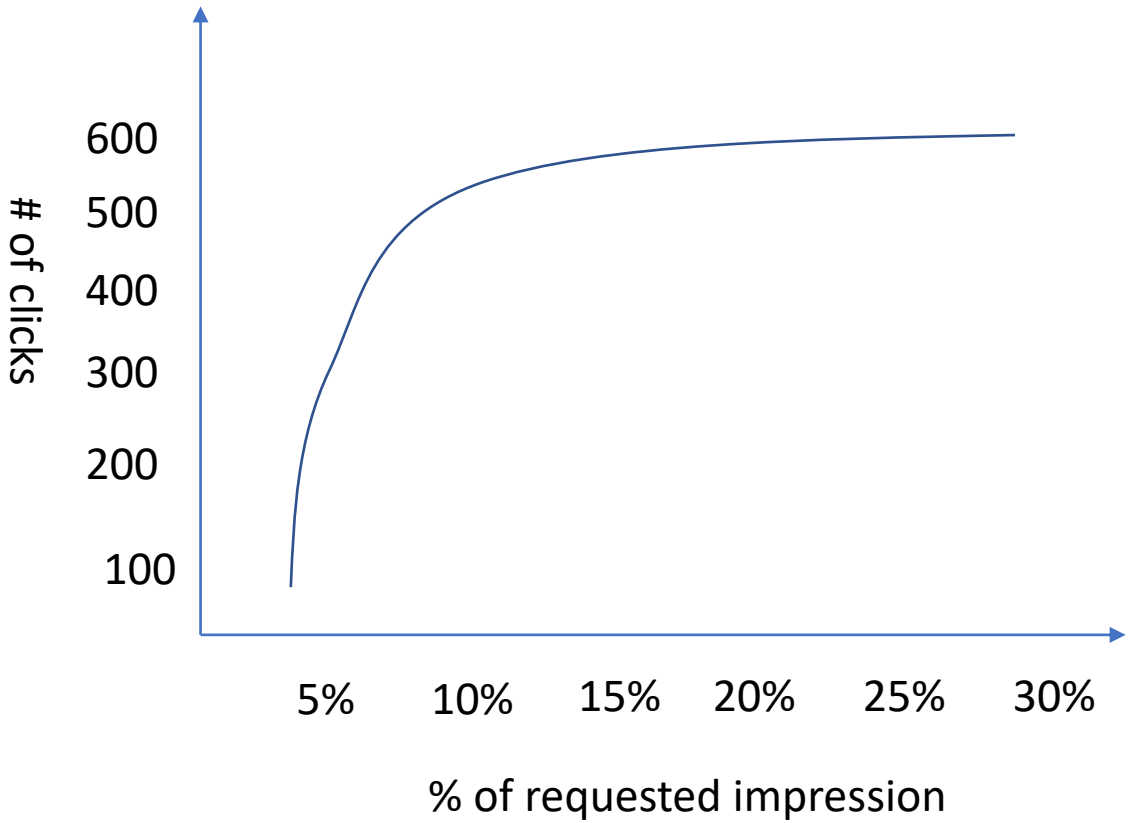


GDIN output


Query:
keyword + attributes
Keyword1
Keyword2
Keyword3
Keyword4
…
Keywordm
Ucdoc1
Score11
score12
score13
score14
…
Score1m
Ucdoc2
score21
score22
score23
score24
…
Score2m
…
…
…
…
…
…
…
Ucdocn
scoren1
scoren2
scoren3
scoren4
…
Scorenm
GDIN
Column-wise sort
Rank1 ucdoc
Rank2 ucdoc
Rank3 ucdoc
Rank4 ucdoc
…
Rankn ucdoc
Rank1 ucdoc
Rank2 ucdoc
Rank3 ucdoc
Rank4 ucdoc
…
Rankn ucdoc

GDIN test results - expected





Testcases Design: Impressions-based, CRT-based.

- **Input**
  - **Impressions to be queried.**
    - Different percentages % of keyword impressions in the testing dataset: 5%, 8%, 10%, 15%, 20%, 25%, 30%, 35%, 40%.
  - **Conditions to be filtered.**
    - Focus more on gender and age conditions.
  - **Keywords to be matched.**
    - Use the current query keyword as the keyword match criteria.

- **Output**
  - CTR.
  - Impressions found. (at least equal or larger than queried impressions.)
  - Other details. (impressions requested, impressions found, click counts, ucdocs selected, ucdocs filtered, ucdocs total, ucdocs selected in filtered %, ucdocs selected in total %, model CTR / expert CTR)

- **Comparisons:**
  - CTR comparisons among the 3 approaches: DIN model recommendation, expert selection, random selection (random repeats = 10).

- **Testing Keywords Selection**
  - Select the top keywords which contain most of the impressions.
  - **Six keywords take 99% of the impressions: video, shopping, info, social, reading, education.**

- **Expert Experience on Testing Keywords**
  - “video” = {"gender": [male, female], "age": [30]}
  - "shopping" = {"gender": [female], "age": [30]}
  - "info" = {"gender": [male], "age": [30, 40]}
  - "social" = {"gender": [male, female], "age": [30]}
  - "reading" = {"gender": [male, female], "age": [30, 40]}
  - "education" = {"gender": [female], "age": [30, 40]}

Testing Result with 6 keywords, 9 impressions %(5%-40%)

Testing result sample:

description (impressions: 15%)	method	CTR	impressions requested	impressions found	click counts	ucdocs selected	ucdocs filtered	ucdocs total	ucdocs selected in filtered %	ucdocs selected in total %	model CTR / expert CTR	AVG model/expert	DIN model average CTR
by din model with keyword video	**by_model**	**0.074**	129970	130881	9624	222	16315	21508	0.014	0.01	**6.73**	**5.46**	**0.047**
by attributes filter {'gender': [0 1] 'age': [3]}	by_expert	0.011	129970	130088	1474	2899	2926	21508	0.991	0.135			
by random selection	by_random	0.022	129970	130304	2863	2472	16477	21508	0.15	0.115			
by din model with keyword shopping	**by_model**	**0.036**	66776	66937	2440	830	12892	21508	0.064	0.039	3.27		
by attributes filter {'gender': [1] 'age': [3]}	by_expert	0.011	66776	23575	261	1264	1264	21508	1.0	0.059			
by random selection	by_random	0.009	66776	67182	611	1921	13058	21508	0.147	0.089			
by din model with keyword info	**by_model**	**0.056**	25574	25835	1434	189	7263	21508	0.026	0.009	9.33		
by attributes filter {'gender': [0] 'age': [3 4]}	by_expert	0.006	25574	25604	166	1557	1711	21508	0.91	0.072			
by random selection	by_random	0.017	25574	25647	438	1089	7278	21508	0.15	0.051			
by din model with keyword social	**by_model**	**0.078**	15955	15975	1247	165	7332	21508	0.023	0.008	7.80		
by attributes filter {'gender': [0 1] 'age': [3]}	by_expert	0.01	15955	16023	164	1511	1543	21508	0.979	0.07			
by random selection	by_random	0.026	15955	15990	425	1115	7341	21508	0.152	0.052			
by din model with keyword reading	**by_model**	**0.023**	1960	2019	46	142	1849	21508	0.077	0.007	4.60		
by attributes filter {'gender': [0 1] 'age': [3 4]}	by_expert	0.005	1960	1960	9	683	920	21508	0.742	0.032			
by random selection	by_random	0.007	1960	1964	13	277	1850	21508	0.15	0.013			
by din model with keyword education	**by_model**	**0.013**	1792	1904	24	192	1592	21508	0.121	0.009	1.00		
by attributes filter {'gender': [1] 'age': [3 4]}	by_expert	0.013	1792	1802	24	462	516	21508	0.895	0.021			
by random selection	by_random	0.008	1792	1800	16	245	1606	21508	0.153	0.011			

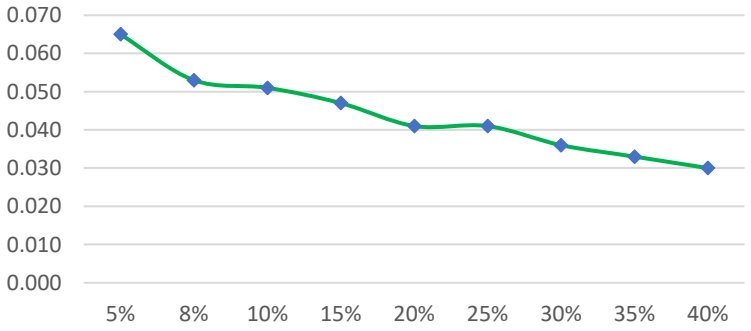
Summary

On average, DIN model has better performance on CTR than expert experience by **523%**.

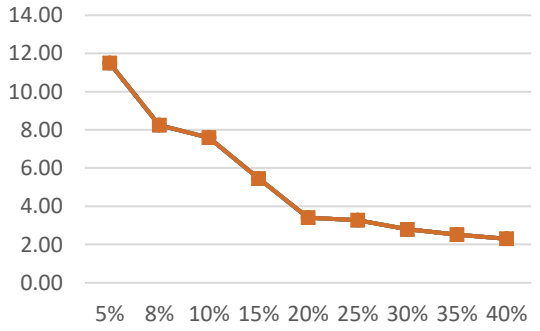
DIN Model AVG CTR: 4.4%

DIN Model CTR / Expert CTR: 523%

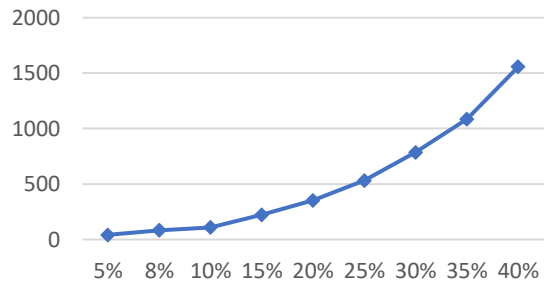
x: % of impressions
y: AVG DIN CTR



x: % of impressions
y: DIN CTR / Expert CTR

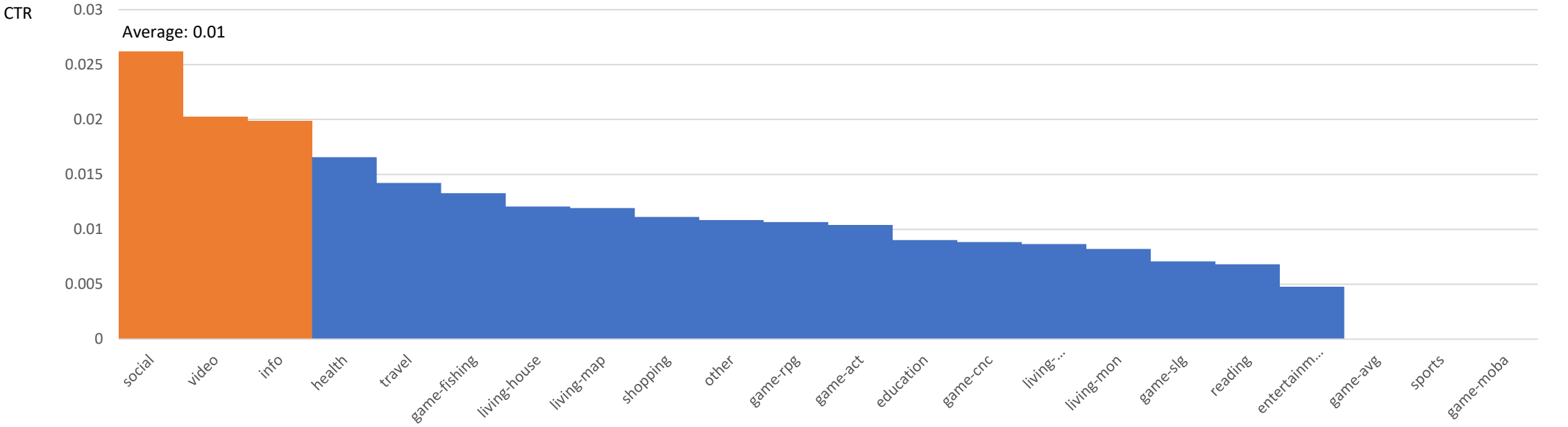


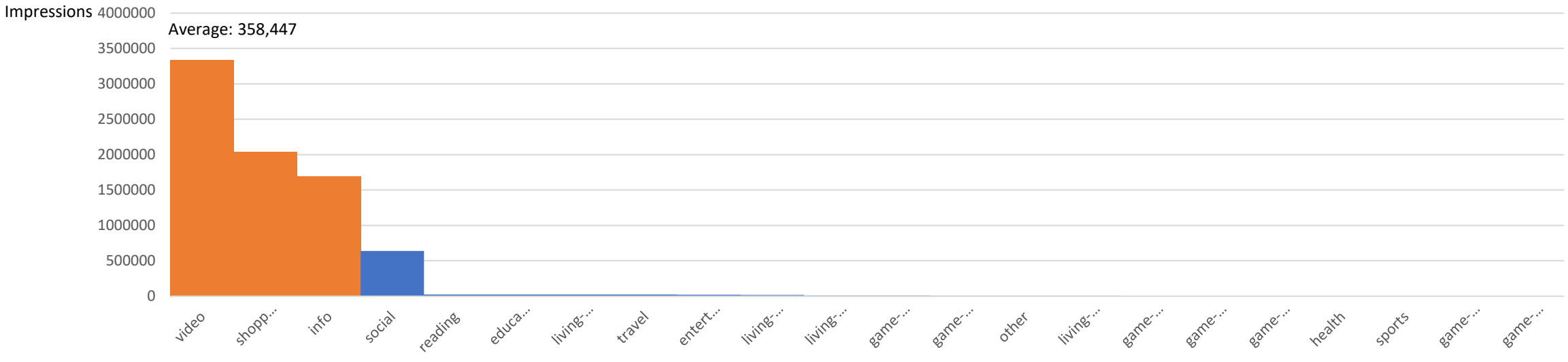
x: % of impressions
y: UCDOCs count for keyword 'video'



Testing Result: Comparing to the real fact data without using DIN.

The average CTR is 1%. 16% keywords take 99% impressions.





GDIN test results – model stability test