Home Work 3

Information Retrieval

Report

A simple statistical relevance model has been implemented in the retrieval system based on the vector relevance model, using the inverted list index that was implemented as part of homework 2. The system will retrieve the documents based on the ranked search model for each query. The vector representations of documents and queries are ranked based on the two weighting functions.

The relevance model reads a query, extracts the tokens, eliminates the stop words and each token is lemmatized.

Results:

Turn in the vector representation of the query (10 points per weighting scheme), and the top 5 documents for the query under both weighting schemes (50 points, with 25 points per weighting scheme). You are also required to present the vector representations for each of the first 5 ranked documents.

Query 1:

```
Query in vector representation based on W1 Function
Query Term set: high law obey similarity aircraft must model heated construct
speed aeroelastic
[0.25119005829256674, 0.3268058004512133, 0.3268058004512133,
0.3268058004512133, 0.25119005829256674, 0.3268058004512133,
0.3268058004512133, 0.3268058004512133, 0.3268058004512133,
0.25119005829256674, 0.25119005829256674]

Document vector based on W1 Function
===================================================
Document vector of query w.r.t to document 486
Term high Weight: 0.20590850034644392
Term law Weight: 0.5046970710694295
Term similarity Weight: 0.5556969460529072
Term model Weight: 0.3245107927263862
Term speed Weight: 0.15931256278495284
Term aeroelastic Weight: 0.513220920101152
=====================================================
===================================================
Document vector of query w.r.t to document 573
Term high Weight: 0.20857892741226372
Term law Weight: 0.3792753954853718
Term obey Weight: 0.6559465105710712
Term similarity Weight: 0.4815713614536926
Term must Weight: 0.3879023131101916
=====================================================
===================================================
Document vector of query w.r.t to document 51
Term aircraft Weight: 0.5802761323869349
Term model Weight: 0.32427905572853055
```

```
Term heated Weight: 0.45800865524350887
Term construct Weight: 0.5676909774853157
Term speed Weight: 0.16148600559080234
=====================================================
=====================================================
Document vector of query w.r.t to document 184
Term similarity Weight: 0.5657983716491717
Term aircraft Weight: 0.34784718197064424
Term model Weight: 0.33040973035991844
Term aeroelastic Weight: 0.670599694838667
=====================================================
=====================================================
Document vector of query w.r.t to document 1268
Term high Weight: 0.2715474274384854
Term must Weight: 0.428583834393351
Term model Weight: 0.2949095032437942
Term heated Weight: 0.7898190795091118
Term speed Weight: 0.17830338776397733
```

```
**************************************************
Query in vector representation based on W2 Function
Query Term set: high law obey similarity aircraft must model heated construct
speed aeroelastic
[0.25119005829256674, 0.3268058004512133, 0.3268058004512133,
0.3268058004512133, 0.25119005829256674, 0.3268058004512133,
0.3268058004512133, 0.3268058004512133, 0.3268058004512133,
0.25119005829256674, 0.25119005829256674]
**************************************************
```

```
Document vector based on W2 Function
=====================================================
Document vector of query w.r.t to document 486
Term high Weight: 0.35991717618364644
Term law Weight: 0.4448877799097376
Term similarity Weight: 0.4633424369073215
Term model Weight: 0.406072024918158
Term speed Weight: 0.3521701377565264
Term aeroelastic Weight: 0.4110109249000269
=====================================================
=====================================================
Document vector of query w.r.t to document 51
Term aircraft Weight: 0.5090976758460484
Term model Weight: 0.4328575220145162
Term heated Weight: 0.42896518921065907
Term construct Weight: 0.4784569471107512
Term speed Weight: 0.37486229243620645
=====================================================
=====================================================
Document vector of query w.r.t to document 573
Term high Weight: 0.3964949428232186
Term law Weight: 0.43260633718991415
Term obey Weight: 0.4911370136562487
Term similarity Weight: 0.4750761189149171
```

```
Term must Weight: 0.4344313897410041
======================================================
====================================================
Document vector of query w.r.t to document 1268
Term high Weight: 0.4165307948530459
Term must Weight: 0.42229303996806783
Term model Weight: 0.4205782330167524
Term heated Weight: 0.5639570467240711
Term speed Weight: 0.39145508643570825
======================================================
====================================================
Document vector of query w.r.t to document 14
Term high Weight: 0.4322599287003377
Term aircraft Weight: 0.43084152782926627
Term model Weight: 0.415570928968731
Term speed Weight: 0.4065227388320536
Term aeroelastic Weight: 0.5381142980318162
======================================================
***************************************************************************
================================================================
```

Query 2:

```
**************************************************
Query in vector representation based on W1 Function
Query Term set: flight high problem structural aircraft associate speed
aeroelastic
[0.426494278569097, 0.3278127944709187, 0.1564064518111236,
0.426494278569097, 0.3278127944709187, 0.426494278569097, 0.3278127944709187,
0.3278127944709187]
```

```
************************************************************************
Document vector based on W1 Function
====================================================
Document vector of query w.r.t to document 12
Term flight Weight: 0.33343472253760825
Term high Weight: 0.2818753214621043
Term problem Weight: 0.14228375904574966
Term structural Weight: 0.5267547052073909
Term aircraft Weight: 0.37014540489565045
Term speed Weight: 0.21808851879550778
Term aeroelastic Weight: 0.5719109883669012
======================================================
====================================================
Document vector of query w.r.t to document 14
Term flight Weight: 0.29793757895869377
Term high Weight: 0.2798625517510824
Term problem Weight: 0.24100455521075181
Term aircraft Weight: 0.3739928511038936
Term speed Weight: 0.1793762962041453
Term aeroelastic Weight: 0.7763893657325145
======================================================
====================================================
Document vector of query w.r.t to document 51
Term flight Weight: 0.2947167542493897
```

```
Term problem Weight: 0.17743716650759278
Term structural Weight: 0.6660688242358558
Term aircraft Weight: 0.637594275405044
Term speed Weight: 0.17743716650759278
======================================================
====================================================
Document vector of query w.r.t to document 172
Term flight Weight: 0.40470421502818826
Term high Weight: 0.3149210909597157
Term problem Weight: 0.33525445717964175
Term aircraft Weight: 0.508014073824301
Term associate Weight: 0.5265323231233188
Term speed Weight: 0.29887968691622885
======================================================
====================================================
Document vector of query w.r.t to document 746
Term flight Weight: 0.342229353046338
Term high Weight: 0.26630619899099334
Term problem Weight: 0.3106051939079586
Term speed Weight: 0.20604260132725247
Term aeroelastic Weight: 0.8203846282373608
```

```
**************************************************
Query in vector representation based on W2 Function
Query Term set: flight high problem structural aircraft associate speed
aeroelastic
[0.42649427856909694, 0.3278127944709187, 0.15640645181112356,
0.42649427856909694, 0.3278127944709187, 0.42649427856909694,
0.3278127944709187, 0.3278127944709187]
```

```
Document vector based on W2 Function
====================================================
Document vector of query w.r.t to document 12
Term flight Weight: 0.3741182902971551
Term high Weight: 0.3614051166720659
Term problem Weight: 0.31723105955781333
Term structural Weight: 0.42489870846634326
Term aircraft Weight: 0.3797496797289355
Term speed Weight: 0.34446201468161236
Term aeroelastic Weight: 0.43056183074106813
======================================================
====================================================
Document vector of query w.r.t to document 14
Term flight Weight: 0.386016592245706
Term high Weight: 0.39602305552164346
Term problem Weight: 0.3957065135187576
Term aircraft Weight: 0.39472356091291305
Term speed Weight: 0.3724434454411438
Term aeroelastic Weight: 0.49300352490961225
======================================================
====================================================
Document vector of query w.r.t to document 172
Term flight Weight: 0.404704341828645
Term high Weight: 0.39418744206658085
```

```
Term problem Weight: 0.41230651267965723
Term aircraft Weight: 0.41680571879301875
Term associate Weight: 0.4189748855898675
Term speed Weight: 0.401954019572365
=====================================================
===================================================
Document vector of query w.r.t to document 51
Term flight Weight: 0.4035853162347368
Term problem Weight: 0.3836536784754857
Term structural Weight: 0.5208251603002118
Term aircraft Weight: 0.5210371914771761
Term speed Weight: 0.3836536784754857
=====================================================
===================================================
Document vector of query w.r.t to document 746
Term flight Weight: 0.4269505902197936
Term high Weight: 0.4131224734084481
Term problem Weight: 0.43693803352893473
Term speed Weight: 0.40214647961136907
Term aeroelastic Weight: 0.5425922771915449
```

Query 3:

```
*************************************************
Query in vector representation based on W1 Function
Query Term set: heat problem composite far conduction solve so slab
[0.2963861577518071, 0.14141213546808204, 0.3856072815346977,
0.3856072815346977, 0.3856072815346977, 0.3856072815346977,
0.3856072815346977, 0.3856072815346977]
```

```
Document vector based on W1 Function
===================================================
Document vector of query w.r.t to document 485
Term heat Weight: 0.216030663072757
Term composite Weight: 0.676965829963617
Term conduction Weight: 0.3360817527274637
Term slab Weight: 0.6181400109664897
=====================================================
===================================================
Document vector of query w.r.t to document 5
Term heat Weight: 0.29021078725534927
Term composite Weight: 0.5217270271604147
Term conduction Weight: 0.48239580843102575
Term slab Weight: 0.6409936755531705
=====================================================
===================================================
Document vector of query w.r.t to document 144
Term heat Weight: 0.24089345497629647
Term problem Weight: 0.12729034837527473
Term composite Weight: 0.7548772723338312
Term slab Weight: 0.5965968607643852
=====================================================
===================================================
Document vector of query w.r.t to document 399
Term heat Weight: 0.31387645123255403
```

```
Term composite Weight: 0.6252465180915785
Term conduction Weight: 0.4296562862767689
Term slab Weight: 0.5709149154111064
======================================================
====================================================
Document vector of query w.r.t to document 181
Term heat Weight: 0.2948289683293964
Term problem Weight: 0.2539518506008677
Term composite Weight: 0.6674670005795674
Term conduction Weight: 0.6348796265021693
```

```
**************************************************
Query in vector representation based on W2 Function
Query Term set: heat problem composite far conduction solve so slab
[0.2963861577518072, 0.14141213546808204, 0.38560728153469775,
0.38560728153469775, 0.38560728153469775, 0.38560728153469775,
0.38560728153469775, 0.38560728153469775]
```

```
Document vector based on W2 Function
====================================================
Document vector of query w.r.t to document 485
Term heat Weight: 0.4075938643242669
Term composite Weight: 0.5695989903258529
Term conduction Weight: 0.45618776772931086
Term slab Weight: 0.5489234487240714
======================================================
====================================================
Document vector of query w.r.t to document 5
Term heat Weight: 0.42838321695195575
Term composite Weight: 0.512832426422833
Term conduction Weight: 0.49903809002114596
Term slab Weight: 0.5517714260010299
======================================================
====================================================
Document vector of query w.r.t to document 144
Term heat Weight: 0.4283619687253179
Term problem Weight: 0.3793604889605432
Term composite Weight: 0.6086726664901589
Term slab Weight: 0.5496446381373579
======================================================
====================================================
Document vector of query w.r.t to document 399
Term heat Weight: 0.4466556315127771
Term composite Weight: 0.540234661718688
Term conduction Weight: 0.4833404440638588
Term slab Weight: 0.5244304265083873
======================================================
====================================================
Document vector of query w.r.t to document 181
Term heat Weight: 0.4482746431561036
Term problem Weight: 0.4369001523811662
Term composite Weight: 0.559848712197967
Term conduction Weight: 0.5428973389167233
```

Query 4:

```
=================================================================
*************************************************
Query in vector representation based on W1 Function
Query Term set: chemically criterion show react instantaneous develop local
can solution mixture chemical gas assumption validity simplify equilibrium
empirically flow base
[0.2491102036275533, 0.2491102036275533, 0.2491102036275533,
0.2491102036275533, 0.2491102036275533, 0.2491102036275533,
0.2491102036275533, 0.1338328560371392, 0.19147152983234622,
0.2491102036275533, 0.19147152983234622, 0.19147152983234622,
0.2491102036275533, 0.2491102036275533, 0.2491102036275533,
0.2491102036275533, 0.2491102036275533, 0.05763867379520704,
0.2491102036275533]
```

```
Document vector based on W1 Function
=====================================================
Document vector of query w.r.t to document 488
Term chemically Weight: 0.4397683648764108
Term mixture Weight: 0.4654091996155771
Term chemical Weight: 0.3097311922772088
Term gas Weight: 0.24682000452453703
Term react Weight: 0.6123294585588619
Term equilibrium Weight: 0.24124089670943671
Term flow Weight: 0.0
=======================================================
=====================================================
Document vector of query w.r.t to document 166
Term chemically Weight: 0.4714057154774506
Term can Weight: 0.12653130032213705
Term mixture Weight: 0.45386919496689704
Term chemical Weight: 0.33201354613616807
Term show Weight: 0.10027368308903697
Term gas Weight: 0.30267544704862
Term react Weight: 0.49753284942921994
Term equilibrium Weight: 0.3103708531236271
Term flow Weight: 0.0
=======================================================
=====================================================
Document vector of query w.r.t to document 1061
Term chemically Weight: 0.47042672540456537
Term solution Weight: 0.13264144550412155
Term mixture Weight: 0.4514371834007627
Term chemical Weight: 0.43918559017471137
Term gas Weight: 0.20013088017846584
Term assumption Weight: 0.22633396700227126
Term react Weight: 0.4964995999277111
Term flow Weight: 0.0
Term base Weight: 0.1631997035457521
=======================================================
=====================================================
Document vector of query w.r.t to document 185
Term chemically Weight: 0.6053989985068197
Term can Weight: 0.1833156598310186
Term mixture Weight: 0.6314450802791814
```

```
Term gas Weight: 0.41538543775941894
Term base Weight: 0.16917290018289555
=====================================================
===================================================
Document vector of query w.r.t to document 1255
Term can Weight: 0.18088246721760903
Term solution Weight: 0.14334596378891706
Term mixture Weight: 0.5405925699064731
Term gas Weight: 0.2866919275778341
Term validity Weight: 0.5252243431550526
Term equilibrium Weight: 0.3696751816928298
Term local Weight: 0.32422843100652615
Term flow Weight: 0.0
Term base Weight: 0.2337871973977216

Query in vector representation based on W2 Function
Query Term set: chemically criterion show react instantaneous develop local
can solution mixture chemical gas assumption validity simplify equilibrium
empirically flow base
[0.2491102036275533, 0.2491102036275533, 0.2491102036275533,
0.2491102036275533, 0.2491102036275533, 0.2491102036275533,
0.2491102036275533, 0.1338328560371392, 0.19147152983234622,
0.2491102036275533, 0.19147152983234622, 0.19147152983234622,
0.2491102036275533, 0.2491102036275533, 0.2491102036275533,
0.2491102036275533, 0.2491102036275533, 0.057638673795207034,
0.2491102036275533]
```

```
Document vector based on W2 Function
===================================================
Document vector of query w.r.t to document 166
Term chemically Weight: 0.35833354885331004
Term can Weight: 0.29350698817021237
Term mixture Weight: 0.37847848473037754
Term chemical Weight: 0.33213179387394515
Term show Weight: 0.288571304506382
Term gas Weight: 0.3542914262980906
Term react Weight: 0.36324470537919207
Term equilibrium Weight: 0.34409352644153757
Term flow Weight: 0.2697227100150751
=====================================================
===================================================
Document vector of query w.r.t to document 1061
Term chemically Weight: 0.3515210075796899
Term solution Weight: 0.31153341936895895
Term mixture Weight: 0.372636326991572
Term chemical Weight: 0.38239176421527277
Term gas Weight: 0.3109284022635485
Term assumption Weight: 0.3148635406694444
Term react Weight: 0.35543659090687724
Term flow Weight: 0.2808730611469991
Term base Weight: 0.3053821361873591
=====================================================
===================================================
Document vector of query w.r.t to document 1255
Term can Weight: 0.31630197988251574
Term solution Weight: 0.3107238434359607
```

Term mixture Weight: 0.3697569330806623
Term gas Weight: 0.33202586339092316
Term validity Weight: 0.36747312777301355
Term equilibrium Weight: 0.34435764371009825
Term local Weight: 0.3376039998374782
Term flow Weight: 0.28942182348099826
Term base Weight: 0.3241639216367194
==
==
Document vector of query w.r.t to document 488
Term chemically Weight: 0.39793049316984
Term mixture Weight: 0.41664405964861334
Term chemical Weight: 0.36394867330300673
Term gas Weight: 0.35387932147688683
Term react Weight: 0.4588300953346724
Term equilibrium Weight: 0.34605052279658394
Term flow Weight: 0.2830085130955538
==
==
Document vector of query w.r.t to document 575
Term solution Weight: 0.32223466101308385
Term chemical Weight: 0.3978991672417007
Term show Weight: 0.33273103174581337
Term gas Weight: 0.36092924020375583
Term assumption Weight: 0.34457189324054494
Term develop Weight: 0.3334032771268144
Term equilibrium Weight: 0.4174127989885974
Term flow Weight: 0.30453282328787096

Query 5:

****
Query in vector representation based on W1 Function
Query Term set: system problem chemical hypersonic applicable kinetic aerodynamic
[0.4337161619320775, 0.15905490270239284, 0.3333636913657246, 0.4337161619320775, 0.4337161619320775, 0.4337161619320775, 0.3333636913657246]

Document vector based on W1 Function
==
Document vector of query w.r.t to document 625
Term problem Weight: 0.20766987001342582
Term chemical Weight: 0.5449182122783551
Term hypersonic Weight: 0.4110914432507703
Term kinetic Weight: 0.6276192705385427
Term aerodynamic Weight: 0.3115048050201387
==
==
Document vector of query w.r.t to document 1032
Term system Weight: 0.6251987147616578
Term problem Weight: 0.20394384761324819
Term applicable Weight: 0.43316934073693136
Term kinetic Weight: 0.6163584965964269
==

```
=====================================================
Document vector of query w.r.t to document 103
Term system Weight: 0.3591178160605151
Term chemical Weight: 0.6517258902764381
Term kinetic Weight: 0.668047721447585
=======================================================
=====================================================
Document vector of query w.r.t to document 1296
Term chemical Weight: 0.6611191226838107
Term hypersonic Weight: 0.4246543524673197
Term kinetic Weight: 0.6185387510515005
=======================================================
=====================================================
Document vector of query w.r.t to document 943
Term system Weight: 0.41375830426921534
Term chemical Weight: 0.6617341281325627
Term kinetic Weight: 0.6252295652901426
```

```
**************************************************
Query in vector representation based on W2 Function
Query Term set: system problem chemical hypersonic applicable kinetic
aerodynamic
[0.43371616193207746, 0.15905490270239284, 0.33336369136572463,
0.43371616193207746, 0.43371616193207746, 0.43371616193207746,
0.33336369136572463]
```

```
Document vector based on W2 Function
=====================================================
Document vector of query w.r.t to document 625
Term problem Weight: 0.41506767786078275
Term chemical Weight: 0.4562060966117958
Term hypersonic Weight: 0.4681969782848375
Term kinetic Weight: 0.46629418405208
Term aerodynamic Weight: 0.42773372985262553
=======================================================
=====================================================
Document vector of query w.r.t to document 1032
Term system Weight: 0.5514955065862724
Term problem Weight: 0.43390684495928933
Term applicable Weight: 0.48354808171453173
Term kinetic Weight: 0.5232196563421736
=======================================================
=====================================================
Document vector of query w.r.t to document 401
Term problem Weight: 0.45427289998693204
Term chemical Weight: 0.5442719576094558
Term hypersonic Weight: 0.5120188744877219
Term applicable Weight: 0.4850163303083311
=======================================================
=====================================================
Document vector of query w.r.t to document 163
Term system Weight: 0.49069573605970906
Term problem Weight: 0.4650540933173589
Term chemical Weight: 0.506695191793744
```

Term aerodynamic Weight: 0.5349788477264223
===
==
Document vector of query w.r.t to document 342
Term system Weight: 0.512615588800462
Term problem Weight: 0.4972428695841759
Term hypersonic Weight: 0.49496201206074897
Term aerodynamic Weight: 0.49496201206074897

Query 6:

****
Query in vector representation based on W1 Function
Query Term set: turbulent theoretical experimental couette behaviour do we guide flow
[0.3717730356610913, 0.3717730356610913, 0.2857528549688485, 0.3717730356610913, 0.3717730356610913, 0.2857528549688485, 0.3717730356610913, 0.3717730356610913, 0.08602018069224274]

Document vector based on W1 Function
==
Document vector of query w.r.t to document 798
Term turbulent Weight: 0.4378649725777519
Term behaviour Weight: 0.4689080301537517
Term do Weight: 0.3147329738107628
Term we Weight: 0.46167796080424617
Term guide Weight: 0.5255436620783086
Term flow Weight: 0.0
===
==
Document vector of query w.r.t to document 491
Term turbulent Weight: 0.4262320900226692
Term theoretical Weight: 0.21623526560005027
Term couette Weight: 0.8783897286203789
Term flow Weight: 0.0
===
==
Document vector of query w.r.t to document 315
Term turbulent Weight: 0.6077011210162666
Term behaviour Weight: 0.6199662218108415
Term do Weight: 0.496327745878833
Term flow Weight: 0.0
===
==
Document vector of query w.r.t to document 1122
Term theoretical Weight: 0.40454759408214286
Term experimental Weight: 0.31300074486131363
Term do Weight: 0.4840174132835373
Term we Weight: 0.7099992404763024
===
==
Document vector of query w.r.t to document 386
Term couette Weight: 0.9386117011638397
Term do Weight: 0.3449754693283607
Term flow Weight: 0.0

****
Query in vector representation based on W2 Function
Query Term set: turbulent theoretical experimental couette behaviour do we guide flow
[0.3717730356610913, 0.3717730356610913, 0.28575285496884856, 0.3717730356610913, 0.3717730356610913, 0.28575285496884856, 0.3717730356610913, 0.3717730356610913, 0.08602018069224275]

Document vector based on W2 Function
==
Document vector of query w.r.t to document 798
Term turbulent Weight: 0.4655209263378775
Term behaviour Weight: 0.4051235253011829
Term do Weight: 0.39216104903381793
Term we Weight: 0.4045156474474147
Term guide Weight: 0.4098852426121601
Term flow Weight: 0.36569944882202243
==
==
Document vector of query w.r.t to document 121
Term turbulent Weight: 0.46884239708226955
Term theoretical Weight: 0.45078174301094387
Term experimental Weight: 0.4387003496789548
Term do Weight: 0.4760281539005333
Term flow Weight: 0.39739379304636796
==
==
Document vector of query w.r.t to document 491
Term turbulent Weight: 0.5063449509775315
Term theoretical Weight: 0.4371708276296233
Term couette Weight: 0.6368177378304155
Term flow Weight: 0.3833531359904904
==
==
Document vector of query w.r.t to document 257
Term turbulent Weight: 0.5674439613219879
Term experimental Weight: 0.4547230044575149
Term couette Weight: 0.5426455531401031
Term flow Weight: 0.4204404162703825
==
==
Document vector of query w.r.t to document 1122
Term theoretical Weight: 0.4971730169661609
Term experimental Weight: 0.4806488774984313
Term do Weight: 0.4941738876231561
Term we Weight: 0.5268660328315727

Query 7:

****
Query in vector representation based on W1 Function
Query Term set: equivalent surface lower available possible pressure distribution ogive forebody zero relate attack angle

```
[0.3047335541500846, 0.3047335541500846, 0.3047335541500846,
0.16371614365194603, 0.23422484890101528, 0.2372132554664881,
0.23422484890101528, 0.33937544386017965, 0.33937544386017965,
0.3047335541500846, 0.3047335541500846, 0.2372132554664881,
0.2372132554664881]
```

```
Document vector based on W1 Function
====================================================
Document vector of query w.r.t to document 492
Term zero Weight: 0.20288991364411904
Term surface Weight: 0.1587977609113506
Term attack Weight: 0.36022544133527123
Term lower Weight: 0.2546821301602467
Term angle Weight: 0.2597430956307324
Term pressure Weight: 0.10048234570453882
Term distribution Weight: 0.12215189964910934
Term ogive Weight: 0.5445160131994273
Term forebody Weight: 0.5916178203183745
======================================================
====================================================
Document vector of query w.r.t to document 122
Term zero Weight: 0.37783484265820855
Term equivalent Weight: 0.5250459485981668
Term surface Weight: 0.20311549914232363
Term attack Weight: 0.4403709890392449
Term lower Weight: 0.346368434269644
Term available Weight: 0.339518841218856
Term angle Weight: 0.31753260817733653
Term pressure Weight: 0.10155774957116182
======================================================
====================================================
Document vector of query w.r.t to document 124
Term zero Weight: 0.2758804864479396
Term equivalent Weight: 0.4293534909718242
Term attack Weight: 0.2977250471251124
Term available Weight: 0.3394568469791809
Term angle Weight: 0.2146767454859121
Term pressure Weight: 0.10096029409884191
Term ogive Weight: 0.6923837781923483
======================================================
====================================================
Document vector of query w.r.t to document 434
Term attack Weight: 0.2525056795201594
Term angle Weight: 0.27479005492881364
Term ogive Weight: 0.48303968338934644
Term forebody Weight: 0.7920883611020945
======================================================
====================================================
Document vector of query w.r.t to document 232
Term zero Weight: 0.30508060533939874
Term surface Weight: 0.18367682660496792
Term attack Weight: 0.32923726781513596
Term angle Weight: 0.32364019375850217
Term pressure Weight: 0.14299821894017548
Term distribution Weight: 0.22390476762447495
```

Term ogive Weight: 0.7677673205435522

****
Query in vector representation based on W2 Function
Query Term set: equivalent surface lower available possible pressure distribution ogive forebody zero relate attack angle
[0.3286736760527296, 0.3286736760527296, 0.3286736760527296, 0.1765778202972694, 0.2526257481749995, 0.20600745701348097, 0.2526257481749995, 0.2947300395374994, 0.2947300395374994, 0.3286736760527296, 0.3286736760527296, 0.20600745701348097, 0.20600745701348097]

Document vector based on W2 Function
==
Document vector of query w.r.t to document 492
Term zero Weight: 0.30430919425273656
Term surface Weight: 0.29406925213836754
Term attack Weight: 0.34822213641938465
Term lower Weight: 0.31861311092050065
Term angle Weight: 0.3203426669676621
Term pressure Weight: 0.2761547533466809
Term distribution Weight: 0.2820110594790341
Term ogive Weight: 0.4053023658473461
Term forebody Weight: 0.4188855464100519
===
==
Document vector of query w.r.t to document 122
Term zero Weight: 0.3677456500052647
Term equivalent Weight: 0.38723648025247287
Term surface Weight: 0.329606330793478
Term attack Weight: 0.38427568869198653
Term lower Weight: 0.3415930409112483
Term available Weight: 0.34063695137701955
Term angle Weight: 0.3588835307888992
Term pressure Weight: 0.3114260427952531
===
==
Document vector of query w.r.t to document 124
Term zero Weight: 0.36172892088745123
Term equivalent Weight: 0.3861222303855214
Term attack Weight: 0.36520093950792937
Term available Weight: 0.37183387611401103
Term angle Weight: 0.3520010746101334
Term pressure Weight: 0.3383555841566995
Term ogive Weight: 0.45830164247529853
===
==
Document vector of query w.r.t to document 232
Term zero Weight: 0.3637489821429406
Term surface Weight: 0.346981713983289
Term attack Weight: 0.3670852970566543
Term angle Weight: 0.38509105548619627
Term pressure Weight: 0.351825989886079
Term distribution Weight: 0.36141326625849396

```
Term ogive Weight: 0.4580857513977011
======================================================
====================================================
Document vector of query w.r.t to document 695
Term zero Weight: 0.37205093348500495
Term relate Weight: 0.3939327837133638
Term surface Weight: 0.38130970757461813
Term attack Weight: 0.37470341201285023
Term angle Weight: 0.3646192615404541
Term pressure Weight: 0.36999204341348274
Term distribution Weight: 0.3882705328356423
======================================================
```

```
Query 8:

Query in vector representation based on W1 Function
Query Term set: method presently attack approximate available exact predict
angle pressure body dash
[0.36076325307359275, 0.36076325307359275, 0.193817739333853,
0.36076325307359275, 0.193817739333853, 0.36076325307359275,
0.36076325307359275, 0.193817739333853, 0.193817739333853, 0.193817739333853,
0.40177455837368237]
```

```
Document vector based on W1 Function
====================================================
Document vector of query w.r.t to document 122
Term method Weight: 0.2660109586057817
Term attack Weight: 0.5066997144665777
Term approximate Weight: 0.3674016124885079
Term available Weight: 0.39065720536437604
Term exact Weight: 0.3536676650168968
Term angle Weight: 0.3653594035526841
Term pressure Weight: 0.11685438866407696
Term body Weight: 0.33566845712090615
======================================================
====================================================
Document vector of query w.r.t to document 433
Term method Weight: 0.2335650601813115
Term attack Weight: 0.3799061447235483
Term approximate Weight: 0.2975014062476349
Term available Weight: 0.4331571806979302
Term exact Weight: 0.3921435124685626
Term predict Weight: 0.3520318260856647
Term angle Weight: 0.3236834757002552
Term body Weight: 0.37750830529208806
======================================================
====================================================
Document vector of query w.r.t to document 69
Term method Weight: 0.17060196884033665
Term attack Weight: 0.554365012026674
Term available Weight: 0.4399657455376644
Term predict Weight: 0.5136903685613247
Term angle Weight: 0.39972880260602955
Term body Weight: 0.21527571631847814
======================================================
```

==
Document vector of query w.r.t to document 124
Term attack Weight: 0.41254101322743775
Term approximate Weight: 0.3927350729308902
Term available Weight: 0.4703664436433321
Term exact Weight: 0.5176732201410922
Term angle Weight: 0.2974656077958745
Term pressure Weight: 0.13989505560737636
Term body Weight: 0.2797901112147527
==
==
Document vector of query w.r.t to document 292
Term method Weight: 0.2924361483399538
Term approximate Weight: 0.39005189342093577
Term available Weight: 0.46833547502538475
Term exact Weight: 0.5141364589173774
Term predict Weight: 0.4615463235654358
Term pressure Weight: 0.11457852785815728
Term body Weight: 0.22915705571631456

****
Query in vector representation based on W2 Function
Query Term set: method presently attack approximate available exact predict angle pressure body dash
[0.3714606260926366, 0.3714606260926366, 0.19956483424359728, 0.3714606260926366, 0.19956483424359728, 0.3714606260926366, 0.3714606260926366, 0.19956483424359728, 0.19956483424359728, 0.19956483424359728, 0.3330981851961364]

Document vector based on W2 Function
==
Document vector of query w.r.t to document 122
Term method Weight: 0.3479167520298796
Term attack Weight: 0.3892747591078741
Term approximate Weight: 0.3608393731185649
Term available Weight: 0.3450683222815472
Term exact Weight: 0.3405226920471783
Term angle Weight: 0.363552272773652
Term pressure Weight: 0.31547740686299813
Term body Weight: 0.3612339162713521
==
==
Document vector of query w.r.t to document 433
Term method Weight: 0.3515667872944197
Term attack Weight: 0.34785890145350995
Term approximate Weight: 0.3410022997917358
Term available Weight: 0.35228972847275797
Term exact Weight: 0.3488771287735412
Term predict Weight: 0.3455395797369657
Term angle Weight: 0.3544191259605006
Term body Weight: 0.38506958917538625
==
==
Document vector of query w.r.t to document 232

Term method Weight: 0.37404663166284935
Term attack Weight: 0.371603243695077
Term approximate Weight: 0.36161871732622425
Term predict Weight: 0.4081505270961424
Term angle Weight: 0.3898306101716349
Term pressure Weight: 0.35615613075813424
Term body Weight: 0.38187707842191454
==
==
Document vector of query w.r.t to document 124
Term attack Weight: 0.37775502704770825
Term approximate Weight: 0.3882657741625132 3
Term available Weight: 0.38461597639360035
Term exact Weight: 0.4071808934583062
Term angle Weight: 0.3641014057612692
Term pressure Weight: 0.349986840168252
Term body Weight: 0.3711663735997277
==
==
Document vector of query w.r.t to document 292
Term method Weight: 0.3812235801865755 4
Term approximate Weight: 0.38511669984684566
Term available Weight: 0.3805506159994269
Term exact Weight: 0.4025461070196329
Term predict Weight: 0.39515908931397575
Term pressure Weight: 0.34261534783780495
Term body Weight: 0.3549022224315304

Query 9:

****
Query in vector representation based on W1 Function
Query Term set: heat internal study transfer slip papers flow
[0.3359312578369619, 0.4370566429270184, 0.4370566429270184,
0.4370566429270184, 0.4370566429270184, 0.3359312578369619,
0.10112538509005643]

Document vector based on W1 Function
==
Document vector of query w.r.t to document 550
Term heat Weight: 0.316940907155473
Term study Weight: 0.22276010580646854
Term transfer Weight: 0.3112076962371666
Term slip Weight: 0.8677996119124001
Term flow Weight: 0.0
==
==
Document vector of query w.r.t to document 270
Term heat Weight: 0.33968881351130936
Term study Weight: 0.3685030229790492
Term transfer Weight: 0.37816969731949973
Term papers Weight: 0.778334575911837
Term flow Weight: 0.0
==
==

```
Document vector of query w.r.t to document 22
Term heat Weight: 0.20599346657973636
Term transfer Weight: 0.2293289734831372
Term slip Weight: 0.9513016943365726
Term flow Weight: 0.0
======================================================
====================================================
Document vector of query w.r.t to document 21
Term heat Weight: 0.32048140230699085
Term transfer Weight: 0.35678641770441627
Term slip Weight: 0.877493659758858
Term flow Weight: 0.0
======================================================
====================================================
Document vector of query w.r.t to document 571
Term heat Weight: 0.3525732029936235
Term transfer Weight: 0.39251366590741765
Term slip Weight: 0.8494852315412772
Term flow Weight: 0.0
```

```
Query in vector representation based on W2 Function
Query Term set: heat internal study transfer slip papers flow
[0.335931257836962, 0.4370566429270184, 0.4370566429270184,
0.4370566429270184, 0.4370566429270184, 0.335931257836962,
0.10112538509005643]
**************************************************
```

```
Document vector based on W2 Function
====================================================
Document vector of query w.r.t to document 550
Term heat Weight: 0.4373847573428468
Term study Weight: 0.40526961575755505
Term transfer Weight: 0.43319474799404667
Term slip Weight: 0.5720791755552891
Term flow Weight: 0.3598872598387135
======================================================
====================================================
Document vector of query w.r.t to document 45
Term heat Weight: 0.454741320991796
Term internal Weight: 0.5093945352059187
Term study Weight: 0.4341206175976651
Term transfer Weight: 0.4549561590222374
Term flow Weight: 0.3718625031235829
======================================================
====================================================
Document vector of query w.r.t to document 270
Term heat Weight: 0.4464417244342065
Term study Weight: 0.45516086884661944
Term transfer Weight: 0.454340462606409
Term papers Weight: 0.4951548012251948
Term flow Weight: 0.37671585713536726
======================================================
====================================================
Document vector of query w.r.t to document 21
```

Term heat Weight: 0.47534123691550856
Term transfer Weight: 0.48483842036722286
Term slip Weight: 0.621052443369067
Term flow Weight: 0.39150514327242547
===
===
Document vector of query w.r.t to document 22
Term heat Weight: 0.4487328534302393
Term transfer Weight: 0.4550673866792309
Term slip Weight: 0.6612479939910033
Term flow Weight: 0.3928149567877534
===

Query 10:

****
Query in vector representation based on W1 Function
Query Term set: over wide density available gas property range real transport air enthalpy
[0.32495308466815087, 0.32495308466815087, 0.32495308466815087, 0.17457895648561353, 0.24976602057688216, 0.24976602057688216, 0.32495308466815087, 0.32495308466815087, 0.32495308466815087, 0.32495308466815087, 0.32495308466815087]

Document vector based on W1 Function
===
Document vector of query w.r.t to document 493
Term over Weight: 0.1996458007313615
Term wide Weight: 0.4177026445588659
Term gas Weight: 0.3421432399680388
Term range Weight: 0.20469462102029756
Term real Weight: 0.5173969267784732
Term enthalpy Weight: 0.5991699179770162
===
===
Document vector of query w.r.t to document 302
Term over Weight: 0.18992044247593148
Term property Weight: 0.3609818089545249
Term range Weight: 0.16358856494662002
Term transport Weight: 0.6018722145569222
Term air Weight: 0.3967880487339446
Term enthalpy Weight: 0.535882657191503
===
===
Document vector of query w.r.t to document 949
Term density Weight: 0.44158464095511024
Term property Weight: 0.5008572578795153
Term air Weight: 0.3099212038225922
Term enthalpy Weight: 0.676826314147961
===
===
Document vector of query w.r.t to document 1143
Term gas Weight: 0.3820098814363662
Term real Weight: 0.5729586603234474
Term air Weight: 0.33831630730602985

Term enthalpy Weight: 0.6413492810131979
===
==
Document vector of query w.r.t to document 110
Term density Weight: 0.46129030852889613
Term gas Weight: 0.45674312509879167
Term property Weight: 0.41342711450554626
Term transport Weight: 0.5779256673253217
Term air Weight: 0.2714349147963558

Query in vector representation based on W2 Function
Query Term set: over wide density available gas property range real transport air enthalpy
[0.3249530846681508, 0.3249530846681508, 0.3249530846681508, 0.1745789564856135, 0.24976602057688213, 0.24976602057688213, 0.3249530846681508, 0.3249530846681508, 0.3249530846681508, 0.3249530846681508, 0.3249530846681508]

Document vector based on W2 Function
==
Document vector of query w.r.t to document 493
Term over Weight: 0.3565472246173806
Term wide Weight: 0.4013031218619028
Term gas Weight: 0.40383684949985166
Term range Weight: 0.3663682685150415
Term real Weight: 0.4357911989288454
Term enthalpy Weight: 0.47392615748554984
===
==
Document vector of query w.r.t to document 302
Term over Weight: 0.35559821449119167
Term property Weight: 0.4039125589248911
Term range Weight: 0.3503359205477377
Term transport Weight: 0.46148159019669527
Term air Weight: 0.41957792664040494
Term enthalpy Weight: 0.4457111202932458
===
==
Document vector of query w.r.t to document 1264
Term over Weight: 0.3891200539462797
Term wide Weight: 0.4259610585937394
Term gas Weight: 0.4014388261503072
Term range Weight: 0.40061651607871474
Term real Weight: 0.4342164639228545
Term air Weight: 0.3961718043234452
===
==
Document vector of query w.r.t to document 583
Term gas Weight: 0.4754646183913784
Term property Weight: 0.42826141202949447
Term range Weight: 0.39909428169172306
Term real Weight: 0.5097974316830995
Term air Weight: 0.4139515582706838
===

===
Document vector of query w.r.t to document 1010
Term density Weight: 0.4401093328258025
Term property Weight: 0.48233196995792776
Term range Weight: 0.4019221545854868
Term air Weight: 0.44223059426529326
Term enthalpy Weight: 0.46534968471597477

Query 11:

****
Query in vector representation based on W1 Function
Query Term set: similar strong approximation problem analytical solution newtonian find possible wave blast
[0.33507228862571986, 0.33507228862571986, 0.33507228862571986, 0.12287965020307051, 0.33507228862571986, 0.2575438612041497, 0.33507228862571986, 0.33507228862571986, 0.2575438612041497, 0.2575438612041497, 0.33507228862571986]

Document vector based on W1 Function
===
Document vector of query w.r.t to document 495
Term similar Weight: 0.2508189053119723
Term strong Weight: 0.4946573631808794
Term approximation Weight: 0.2696269840023998
Term solution Weight: 0.1348134920011999
Term newtonian Weight: 0.3357995778664025
Term find Weight: 0.1701156865728494
Term wave Weight: 0.24928839572782308
Term blast Weight: 0.6306228461634559
===
===
Document vector of query w.r.t to document 72
Term similar Weight: 0.3863625110123352
Term strong Weight: 0.535547885405175
Term problem Weight: 0.25107945538614834
Term analytical Weight: 0.45860138737256023
Term solution Weight: 0.1989757607442678
Term find Weight: 0.20881978383175695
Term wave Weight: 0.4553672052552151
===
===
Document vector of query w.r.t to document 110
Term strong Weight: 0.5223214903632258
Term approximation Weight: 0.42599441600977495
Term problem Weight: 0.24291659145161817
Term solution Weight: 0.1613987710975594
Term newtonian Weight: 0.6017282405506813
Term wave Weight: 0.3139651398527171
===
===
Document vector of query w.r.t to document 572
Term strong Weight: 0.6497710754969706
Term problem Weight: 0.22898443975394533
Term solution Weight: 0.18146587512932305

```
Term find Weight: 0.19198178300811924
Term wave Weight: 0.24813285494878717
Term blast Weight: 0.6276996839648866
==================================================
==================================================
Document vector of query w.r.t to document 262
Term similar Weight: 0.36109486612629565
Term problem Weight: 0.23038441086098307
Term find Weight: 0.19516322039030048
Term possible Weight: 0.34982641330960285
Term wave Weight: 0.2977675314131885
Term blast Weight: 0.7532601251117651
```

```
**************************************************
Query in vector representation based on W2 Function
Query Term set: similar strong approximation problem analytical solution
newtonian find possible wave blast
[0.33507228862571986, 0.33507228862571986, 0.33507228862571986,
0.12287965020307048, 0.33507228862571986, 0.2575438612041497,
0.33507228862571986, 0.33507228862571986, 0.2575438612041497,
0.2575438612041497, 0.33507228862571986]
```

```
Document vector based on W2 Function
==================================================
Document vector of query w.r.t to document 495
Term similar Weight: 0.3269186845633116
Term strong Weight: 0.4020117248316309
Term approximation Weight: 0.3395787755921531
Term solution Weight: 0.3042237477927443
Term newtonian Weight: 0.3465867595227391
Term find Weight: 0.3134817979473215
Term wave Weight: 0.33596770314621255
Term blast Weight: 0.43860847706064954
==================================================
==================================================
Document vector of query w.r.t to document 72
Term similar Weight: 0.3732945712220069
Term strong Weight: 0.39073376237198143
Term problem Weight: 0.3669024745356587
Term analytical Weight: 0.38173901544740413
Term solution Weight: 0.3588565200041359
Term find Weight: 0.35254051561038324
Term wave Weight: 0.41781978316896046
==================================================
==================================================
Document vector of query w.r.t to document 110
Term strong Weight: 0.41098568309306555
Term approximation Weight: 0.4274194363222075
Term problem Weight: 0.39021271754529213
Term solution Weight: 0.37125526403082226
Term newtonian Weight: 0.44445804074655987
Term wave Weight: 0.40095387235639046
==================================================
==================================================
```

Document vector of query w.r.t to document 160
Term similar Weight: 0.39709319702038737
Term approximation Weight: 0.4290175222531754
Term problem Weight: 0.379459529593278
Term analytical Weight: 0.43454404671959884
Term solution Weight: 0.4132806842196479
Term find Weight: 0.3932454340386129
===
==
Document vector of query w.r.t to document 572
Term strong Weight: 0.47171986170093344
Term problem Weight: 0.3931173771733586
Term solution Weight: 0.3860243281108215
Term find Weight: 0.37942572295302407
Term wave Weight: 0.38541826197257845
Term blast Weight: 0.4259262871054008

Query 12:

==
****
Query in vector representation based on W1 Function
Query Term set: can performance machine effect channel ground calculate aerodynamic flow
[0.21726540579159673, 0.40440764010108454, 0.40440764010108454, 0.31083652294634057, 0.40440764010108454, 0.40440764010108454, 0.31083652294634057, 0.31083652294634057, 0.09357111715474392]

Document vector based on W1 Function
==
Document vector of query w.r.t to document 624
Term performance Weight: 0.4280204648445722
Term machine Weight: 0.43669595346245277
Term effect Weight: 0.07124747743825283
Term channel Weight: 0.4529595430115459
Term ground Weight: 0.579863260726559
Term calculate Weight: 0.18417205744886017
Term aerodynamic Weight: 0.21374243231475845
Term flow Weight: 0.0
===
==
Document vector of query w.r.t to document 650
Term performance Weight: 0.4856951210938362
Term machine Weight: 0.6008972335012311
Term effect Weight: 0.1293375951455659
Term ground Weight: 0.547533619611547
Term aerodynamic Weight: 0.29411134965051966
===
==
Document vector of query w.r.t to document 506
Term can Weight: 0.20171790568115983
Term performance Weight: 0.4996750520322848
Term machine Weight: 0.6181930667526198
Term effect Weight: 0.10085895284057991
Term ground Weight: 0.5632934694766423

==
==
Document vector of query w.r.t to document 966
Term can Weight: 0.22182911106197414
Term machine Weight: 0.5592144265870858
Term effect Weight: 0.13355729079977918
Term channel Weight: 0.7875490592061896
Term flow Weight: 0.0
==
==
Document vector of query w.r.t to document 649
Term machine Weight: 0.7574552680478853
Term effect Weight: 0.11507086857382152
Term ground Weight: 0.6426664859102058

Query in vector representation based on W2 Function
Query Term set: can performance machine effect channel ground calculate aerodynamic flow
[0.21726540579159676, 0.40440764010108454, 0.40440764010108454, 0.3108365229463406, 0.40440764010108454, 0.40440764010108454, 0.3108365229463406, 0.3108365229463406, 0.09357111715474392]

Document vector based on W2 Function
==
Document vector of query w.r.t to document 624
Term performance Weight: 0.3847093632015195
Term machine Weight: 0.36572343316111067
Term effect Weight: 0.3050382802813176
Term channel Weight: 0.3684241105011786
Term ground Weight: 0.4365843129607007
Term calculate Weight: 0.32379015873045996
Term aerodynamic Weight: 0.32870051637915626
Term flow Weight: 0.29320716223239823
==
==
Document vector of query w.r.t to document 650
Term performance Weight: 0.46288592622846586
Term machine Weight: 0.49053452302536094
Term effect Weight: 0.3782576778293219
Term ground Weight: 0.47772721408606444
Term aerodynamic Weight: 0.41690567171080023
==
==
Document vector of query w.r.t to document 506
Term can Weight: 0.40681404568554913
Term performance Weight: 0.46568826533375357
Term machine Weight: 0.48910658476782193
Term effect Weight: 0.38688503167886173
Term ground Weight: 0.47825881357587025
==
==
Document vector of query w.r.t to document 966
Term can Weight: 0.4196509013513148
Term machine Weight: 0.46200827029119973

Term effect Weight: 0.40632027727720893
Term channel Weight: 0.5523232187741303
Term flow Weight: 0.374545555912654
===
===
Document vector of query w.r.t to document 1339
Term can Weight: 0.437397366823534
Term effect Weight: 0.42066817378553667
Term calculate Weight: 0.4861985288012484
Term aerodynamic Weight: 0.48183619777256365
Term flow Weight: 0.4039389807475394

Query 13:

****
Query in vector representation based on W1 Function
Query Term set: transonic aileron basic mechanism buzz
[0.4667204016109822, 0.4667204016109822, 0.35873146904102793, 0.4667204016109822, 0.4667204016109822]

Document vector based on W1 Function
===
Document vector of query w.r.t to document 496
Term transonic Weight: 0.35558305418758535
Term aileron Weight: 0.58017854290293
Term buzz Weight: 0.7327711443074583
===
===
Document vector of query w.r.t to document 520
Term aileron Weight: 0.7587450796917371
Term basic Weight: 0.44430880533069483
Term mechanism Weight: 0.47633558501248924
===
===
Document vector of query w.r.t to document 903
Term transonic Weight: 0.4322602756014428
Term aileron Weight: 0.7766890958714788
Term mechanism Weight: 0.4581540161248284
===
===
Document vector of query w.r.t to document 643
Term aileron Weight: 1.0
===
===
Document vector of query w.r.t to document 440
Term transonic Weight: 0.7834881414710406
Term basic Weight: 0.6214067365053703

Query in vector representation based on W2 Function
Query Term set: transonic aileron basic mechanism buzz
[0.4667204016109822, 0.4667204016109822, 0.358731469041028, 0.4667204016109822, 0.4667204016109822]

Document vector based on W2 Function
==
Document vector of query w.r.t to document 496
Term transonic Weight: 0.49427468338529
Term aileron Weight: 0.5869052328343262
Term buzz Weight: 0.6412759039883353
==
==
Document vector of query w.r.t to document 903
Term transonic Weight: 0.5427607114221906
Term aileron Weight: 0.6604017795094053
Term mechanism Weight: 0.5189222482774163
==
==
Document vector of query w.r.t to document 520
Term aileron Weight: 0.6465369720151575
Term basic Weight: 0.5360371627788436
Term mechanism Weight: 0.5428205080295687
==
==
Document vector of query w.r.t to document 313
Term transonic Weight: 0.7219827138505923
Term basic Weight: 0.691911093205575
==
==
Document vector of query w.r.t to document 38
Term transonic Weight: 0.7170764369522784
Term mechanism Weight: 0.6969945362539258

Query 14:

****
Query in vector representation based on W1 Function
Query Term set: shock sound interaction papers wave
[0.48902480731642683, 0.48902480731642683, 0.48902480731642683, 0.3758751212087564, 0.3758751212087564]

Document vector based on W1 Function
==
Document vector of query w.r.t to document 64
Term shock Weight: 0.34314903435809535
Term sound Weight: 0.739890920683154
Term interaction Weight: 0.35242938513741423
Term wave Weight: 0.45891578116404497
==
==
Document vector of query w.r.t to document 132
Term shock Weight: 0.38862032317856604
Term sound Weight: 0.7924312486493519
Term wave Weight: 0.47013504504197073
==
==
Document vector of query w.r.t to document 402

```
Term shock Weight: 0.41570111633648144
Term sound Weight: 0.7648240979234838
Term wave Weight: 0.4921754576491319
=======================================================
=====================================================
Document vector of query w.r.t to document 65
Term shock Weight: 0.38968314710223145
Term sound Weight: 0.6917970864307926
Term wave Weight: 0.6079176227667422
=======================================================
=====================================================
Document vector of query w.r.t to document 256
Term shock Weight: 0.45829373978319643
Term interaction Weight: 0.7277719954283766
Term wave Weight: 0.5102105161065683
```

```
**************************************************
Query in vector representation based on W2 Function
Query Term set: shock sound interaction papers wave
[0.48902480731642683, 0.48902480731642683, 0.48902480731642683,
0.3758751212087565, 0.3758751212087565]
```

```
Document vector based on W2 Function
=====================================================
Document vector of query w.r.t to document 64
Term shock Weight: 0.4681661335380416
Term sound Weight: 0.5789079343153272
Term interaction Weight: 0.44893178604913686
Term wave Weight: 0.49411165384914113
=======================================================
=====================================================
Document vector of query w.r.t to document 132
Term shock Weight: 0.5376804601622643
Term sound Weight: 0.6285530961116538
Term wave Weight: 0.5619792951062785
=======================================================
=====================================================
Document vector of query w.r.t to document 402
Term shock Weight: 0.5433530661559511
Term sound Weight: 0.6234413273168357
Term wave Weight: 0.5622173573381994
=======================================================
=====================================================
Document vector of query w.r.t to document 256
Term shock Weight: 0.552747512703487
Term interaction Weight: 0.6128515313758008
Term wave Weight: 0.5646974302141319
=======================================================
=====================================================
Document vector of query w.r.t to document 65
Term shock Weight: 0.5422116539994493
Term sound Weight: 0.5999290746441626
Term wave Weight: 0.5882955274891866
=======================================================
```

Query 15:

****
Query in vector representation based on W1 Function
Query Term set: material property photoelastic
[0.6618895523378245, 0.4568126044186016, 0.5943269007459853]

Document vector based on W1 Function
===
Document vector of query w.r.t to document 462
Term material Weight: 0.47210573908708797
Term property Weight: 0.3429317893425037
Term photoelastic Weight: 0.8121046478006286
===
===
Document vector of query w.r.t to document 463
Term material Weight: 0.731715193089717
Term property Weight: 0.6816105018276039
===
===
Document vector of query w.r.t to document 82
Term material Weight: 0.7518200930140367
Term property Weight: 0.6593682944609676
===
===
Document vector of query w.r.t to document 1025
Term material Weight: 0.8267616515315893
Term property Weight: 0.5625523722790251
===
===
Document vector of query w.r.t to document 542
Term material Weight: 0.738100244671064
Term property Weight: 0.6746910617582802

Query in vector representation based on W2 Function
Query Term set: material property photoelastic
[0.5568154365000765, 0.5061958513637058, 0.6585759863048475]

Document vector based on W2 Function
===
Document vector of query w.r.t to document 462
Term material Weight: 0.5730685963492176
Term property Weight: 0.5224198433091322
Term photoelastic Weight: 0.631403113070564
===
===
Document vector of query w.r.t to document 463
Term material Weight: 0.7118027530989746
Term property Weight: 0.7023794136225238
===
===
Document vector of query w.r.t to document 1025
Term material Weight: 0.7488352914031642
Term property Weight: 0.6627561439542736

```
======================================================
====================================================
Document vector of query w.r.t to document 1099
Term material Weight: 0.7488137882083001
Term property Weight: 0.6627804392022558
======================================================
====================================================
Document vector of query w.r.t to document 542
Term material Weight: 0.707448658217411
Term property Weight: 0.7067647387825633
```

```
Query 16:

Query in vector representation based on W1 Function
Query Term set: can computer transverse about electronic calculate body
revolution potential flow
[0.23223498571616177, 0.432271314341082, 0.3322531500286218,
0.3322531500286218, 0.432271314341082, 0.3322531500286218,
0.23223498571616177, 0.25854320413867643, 0.3322531500286218,
0.10001816431246015]
```

```
Document vector based on W1 Function
====================================================
Document vector of query w.r.t to document 498
Term computer Weight: 0.3904946418457835
Term about Weight: 0.27611733681088113
Term electronic Weight: 0.5173640925613654
Term calculate Weight: 0.29182065149182845
Term body Weight: 0.2457335624545569
Term revolution Weight: 0.44383725147842545
Term potential Weight: 0.40133746968942324
Term flow Weight: 0.0
======================================================
====================================================
Document vector of query w.r.t to document 869
Term computer Weight: 0.5821488720596006
Term about Weight: 0.24260154753560223
Term electronic Weight: 0.6287765850024122
Term calculate Weight: 0.22338319179707372
Term potential Weight: 0.39621602146849366
Term flow Weight: 0.0
======================================================
====================================================
Document vector of query w.r.t to document 106
Term transverse Weight: 0.47509922429544515
Term body Weight: 0.305244357978626
Term revolution Weight: 0.555280928596714
Term potential Weight: 0.6105486871109082
Term flow Weight: 0.0
======================================================
====================================================
Document vector of query w.r.t to document 927
Term about Weight: 0.3012393207503622
Term calculate Weight: 0.3560760834494003
Term body Weight: 0.34725708243790054
```

```
Term revolution Weight: 0.5744031344273192
Term potential Weight: 0.5761408267828139
Term flow Weight: 0.0
=====================================================
===================================================
Document vector of query w.r.t to document 1043
Term can Weight: 0.2699423354948821
Term computer Weight: 0.5997272106016194
Term transverse Weight: 0.5006919746466318
Term revolution Weight: 0.5628196468639187
```

```
*************************************************
Query in vector representation based on W2 Function
Query Term set: can computer transverse about electronic calculate body
revolution potential flow
[0.23223498571616172, 0.43227131434108196, 0.3322531500286218,
0.3322531500286218, 0.43227131434108196, 0.3322531500286218,
0.23223498571616172, 0.25854320413867643, 0.3322531500286218,
0.10001816431246012]
```

```
Document vector based on W2 Function
===================================================
Document vector of query w.r.t to document 498
Term computer Weight: 0.35324169550103024
Term about Weight: 0.3474600821796394
Term electronic Weight: 0.3770682210141363
Term calculate Weight: 0.35399228440934966
Term body Weight: 0.34233872034168394
Term revolution Weight: 0.39142860471206137
Term potential Weight: 0.37180856387538624
Term flow Weight: 0.27990543926131567
=====================================================
===================================================
Document vector of query w.r.t to document 1255
Term can Weight: 0.3846046669561051
Term about Weight: 0.421246636964923
Term calculate Weight: 0.3941643272880668
Term body Weight: 0.4231528737718139
Term potential Weight: 0.465144044937486
Term flow Weight: 0.35191997239815903
=====================================================
===================================================
Document vector of query w.r.t to document 869
Term computer Weight: 0.4613732538318751
Term about Weight: 0.38789275090556646
Term electronic Weight: 0.44208691008656215
Term calculate Weight: 0.38519572875487834
Term potential Weight: 0.40945035159211923
Term flow Weight: 0.35384708350317695
=====================================================
===================================================
Document vector of query w.r.t to document 927
Term about Weight: 0.38254552276274223
Term calculate Weight: 0.40930283654622834
```

Term body Weight: 0.424645499284129
Term revolution Weight: 0.4416835201963455
Term potential Weight: 0.4285268705291301
Term flow Weight: 0.3564922161402674
==
==
Document vector of query w.r.t to document 106
Term transverse Weight: 0.4599772259838023
Term body Weight: 0.42443723845123754
Term revolution Weight: 0.4857048170100187
Term potential Weight: 0.4991037425558643
Term flow Weight: 0.3510844159060995
==

Query 17:

===
****
Query in vector representation based on W1 Function
Query Term set: reduce can problem dimensional transverse about body three revolution two potential flow
[0.37053587824662265, 0.1990680194060514, 0.19688796403915707, 0.41265812849783984, 0.28480194882633697, 0.28480194882633697, 0.1990680194060514, 0.37053587824662265, 0.2216189925909126, 0.37053587824662265, 0.28480194882633697, 0.08573392942028561]

****
Document vector based on W1 Function
==
Document vector of query w.r.t to document 1108
Term reduce Weight: 0.4631865327411885
Term can Weight: 0.2877427577835202
Term problem Weight: 0.31694964967012823
Term dimensional Weight: 0.3115619636237347
Term body Weight: 0.30368121943730414
Term three Weight: 0.40038740986425014
Term revolution Weight: 0.5025953069921214
Term flow Weight: 0.0
==
==
Document vector of query w.r.t to document 916
Term reduce Weight: 0.5199652803919297
Term can Weight: 0.3261064588216438
Term dimensional Weight: 0.27741556146522256
Term body Weight: 0.2146379774467357
Term three Weight: 0.3565059637550557
Term potential Weight: 0.6108725950665476
Term flow Weight: 0.0
==
==
Document vector of query w.r.t to document 373
Term can Weight: 0.239936876096558
Term dimensional Weight: 0.41205604808979424
Term about Weight: 0.33679398504639874

```
Term body Weight: 0.3422044171589233
Term three Weight: 0.47750818665990125
Term revolution Weight: 0.5002593892015017
Term two Weight: 0.25265100914828603
Term flow Weight: 0.0
======================================================
====================================================
Document vector of query w.r.t to document 801
Term can Weight: 0.23799465065617423
Term dimensional Weight: 0.307603623659221
Term about Weight: 0.4041457853815726
Term body Weight: 0.36497771729790995
Term three Weight: 0.3953005582238241
Term revolution Weight: 0.6003008744811564
Term two Weight: 0.18860629833113388
Term flow Weight: 0.0
======================================================
====================================================
Document vector of query w.r.t to document 336
Term reduce Weight: 0.4530175811196797
Term problem Weight: 0.35239570286178296
Term dimensional Weight: 0.3385045835428473
Term body Weight: 0.2619028968106198
Term three Weight: 0.4350112955237918
Term revolution Weight: 0.5460577186803848


**************************************************
Query in vector representation based on W2 Function
Query Term set: reduce can problem dimensional transverse about body three
revolution two potential flow
[0.3849562654393132, 0.20681527975530872, 0.16470228958788,
0.3452000680301961, 0.2958857725973109, 0.2958857725973109,
0.20681527975530872, 0.3849562654393132, 0.23024388391732795,
0.3849562654393132, 0.2958857725973109, 0.08907049284200223]
**************************************************
```

```
Document vector based on W2 Function
====================================================
Document vector of query w.r.t to document 1108
Term reduce Weight: 0.3765923448086959
Term can Weight: 0.35095063683491856
Term problem Weight: 0.35915117168665583
Term dimensional Weight: 0.3463403253253461
Term body Weight: 0.3555666602800864
Term three Weight: 0.3592120968198862
Term revolution Weight: 0.37402313073470767
Term flow Weight: 0.30119161432088926
======================================================
====================================================
Document vector of query w.r.t to document 801
Term can Weight: 0.33819219315146
Term dimensional Weight: 0.34577709105859056
Term about Weight: 0.3687253271291998
Term body Weight: 0.37236464695878135
```

```
Term three Weight: 0.3553329323064095
Term revolution Weight: 0.3961315444643323
Term two Weight: 0.3328106224426028
Term flow Weight: 0.3122592559194844
=====================================================
===================================================
Document vector of query w.r.t to document 373
Term can Weight: 0.3380192005215453
Term dimensional Weight: 0.37225837357351305
Term about Weight: 0.34625095995523886
Term body Weight: 0.3664416768488371
Term three Weight: 0.3729862612806063
Term revolution Weight: 0.3601436715726497
Term two Weight: 0.3511241809607626
Term flow Weight: 0.317627278186535
=====================================================
===================================================
Document vector of query w.r.t to document 1248
Term reduce Weight: 0.383930243881121
Term can Weight: 0.34845061796901056
Term problem Weight: 0.34845061796901056
Term dimensional Weight: 0.35395394522978685
Term about Weight: 0.3560462131502468
Term body Weight: 0.3610245292393443
Term two Weight: 0.34454594513748754
Term flow Weight: 0.32963461778441194
=====================================================
===================================================
Document vector of query w.r.t to document 916
Term reduce Weight: 0.4169652629294202
Term can Weight: 0.38332527304217584
Term dimensional Weight: 0.3612686318298142
Term body Weight: 0.35248359009823016
Term three Weight: 0.372336475480493
Term potential Weight: 0.4264214637300116
Term flow Weight: 0.3224473340279566
```

```
Query 18:


Query in vector representation based on W1 Function
Query Term set: attack available angle experimental pressure distribution
body revolution
[0.31108948264093833, 0.31108948264093833, 0.31108948264093833,
0.44506843027757015, 0.31108948264093833, 0.44506843027757015,
0.31108948264093833, 0.3463305555267768]
**************************************************
```

```
*************************************************************************
Document vector based on W1 Function
===================================================
Document vector of query w.r.t to document 197
Term attack Weight: 0.4983119016681996
Term angle Weight: 0.42425700670429417
```

Term experimental Weight: 0.25068894737972386
Term pressure Weight: 0.1699329277615619
Term distribution Weight: 0.3146898604638423
Term body Weight: 0.3282500280649599
Term revolution Weight: 0.5226770546319833
==
==
Document vector of query w.r.t to document 234
Term attack Weight: 0.4726623897350531
Term angle Weight: 0.340816550443855
Term experimental Weight: 0.3130882010362414
Term pressure Weight: 0.16497610068596694
Term distribution Weight: 0.29196819348789
Term body Weight: 0.384293572448812
Term revolution Weight: 0.5497872615965119
==
==
Document vector of query w.r.t to document 498
Term attack Weight: 0.395848551192911
Term angle Weight: 0.28542939029142833
Term experimental Weight: 0.22083832180296534
Term pressure Weight: 0.13593215287414534
Term distribution Weight: 0.2718643057482907
Term body Weight: 0.3816038536402659
Term revolution Weight: 0.6892424618822358
==
==
Document vector of query w.r.t to document 248
Term attack Weight: 0.4962070552180251
Term angle Weight: 0.35779359758263635
Term pressure Weight: 0.13841345763538876
Term distribution Weight: 0.2768269152707775
Term body Weight: 0.3148242097537516
Term revolution Weight: 0.6563966716557437
==
==
Document vector of query w.r.t to document 225
Term attack Weight: 0.5829743401560599
Term angle Weight: 0.44364194700840787
Term experimental Weight: 0.22660582056436554
Term pressure Weight: 0.15133576955512434
Term distribution Weight: 0.2724649215252156
Term body Weight: 0.3026715391102487
Term revolution Weight: 0.4724646383218491

****
Query in vector representation based on W2 Function
Query Term set: attack available angle experimental pressure distribution body revolution
[0.31108948264093844, 0.31108948264093844, 0.31108948264093844, 0.44506843027757026, 0.31108948264093844, 0.44506843027757026, 0.31108948264093844, 0.3463305555267769]

Document vector of query w.r.t to document 197

Term attack Weight: 0.3989366200122096
Term angle Weight: 0.3956780612936283
Term experimental Weight: 0.35363011205262473
Term pressure Weight: 0.34898655215065366
Term distribution Weight: 0.37410358023871626
Term body Weight: 0.3778873408857691
Term revolution Weight: 0.3933068066314815
==
==
Document vector of query w.r.t to document 498
Term attack Weight: 0.37522469567701255
Term angle Weight: 0.35993806542608286
Term experimental Weight: 0.35099595996689936
Term pressure Weight: 0.3433686697114225
Term distribution Weight: 0.366314639957805
Term body Weight: 0.3918934094056024
Term revolution Weight: 0.44808922077637814
==
==
Document vector of query w.r.t to document 234
Term attack Weight: 0.38664122900050085
Term angle Weight: 0.36944616408826186
Term experimental Weight: 0.3752521283147199
Term pressure Weight: 0.3526787565807344
Term distribution Weight: 0.3685544234539862
Term body Weight: 0.39448525187366734
Term revolution Weight: 0.3966996971716268
==
==
Document vector of query w.r.t to document 1352
Term attack Weight: 0.3740103042916741
Term angle Weight: 0.3611154548802953
Term experimental Weight: 0.36826582860213797
Term pressure Weight: 0.3656988661673225
Term distribution Weight: 0.3777564751459614
Term body Weight: 0.38439207617436066
Term revolution Weight: 0.41218844787041925
==
==
Document vector of query w.r.t to document 927
Term attack Weight: 0.38329905476396287
Term angle Weight: 0.3800372687549075
Term experimental Weight: 0.3482362989319037
Term pressure Weight: 0.3396194800913868
Term distribution Weight: 0.3852276667249036
Term body Weight: 0.39428291555164285
Term revolution Weight: 0.4101027006943643

Query 19:

****
Query in vector representation based on W1 Function
Query Term set: treatment simplicity do good exist result entry dynamics re realistic effect consideration basic combine relative

```
[0.26946114950639083, 0.26946114950639083, 0.20711371021762737,
0.26946114950639083, 0.26946114950639083, 0.26946114950639083,
0.26946114950639083, 0.26946114950639083, 0.26946114950639083,
0.26946114950639083, 0.20711371021762737, 0.26946114950639083,
0.20711371021762737, 0.26946114950639083, 0.26946114950639083]
```

```
Document vector based on W1 Function
====================================================
Document vector of query w.r.t to document 82
Term result Weight: 0.08073345416853188
Term entry Weight: 0.4943043333316838
Term re Weight: 0.5258923351323459
Term realistic Weight: 0.6346020374543965
Term effect Weight: 0.06714504944873301
Term do Weight: 0.25564503451043474
======================================================
====================================================
Document vector of query w.r.t to document 1119
Term result Weight: 0.12193069625878941
Term simplicity Weight: 0.6941280534370124
Term do Weight: 0.3853600444021807
Term good Weight: 0.3362277445504928
Term combine Weight: 0.49169878046872234
======================================================
====================================================
Document vector of query w.r.t to document 274
Term exist Weight: 0.4100116392981769
Term result Weight: 0.13164055489575158
Term entry Weight: 0.5683286037310115
Term re Weight: 0.5489288585538992
Term effect Weight: 0.11080078869765925
Term do Weight: 0.42185792821589746
======================================================
====================================================
Document vector of query w.r.t to document 1296
Term result Weight: 0.10005729486327994
Term entry Weight: 0.5132221832636766
Term dynamics Weight: 0.6861910265962495
Term re Weight: 0.495703481038953
Term effect Weight: 0.10005729486327994
======================================================
====================================================
Document vector of query w.r.t to document 1279
Term entry Weight: 0.513386760690153
Term re Weight: 0.4958624406589094
Term effect Weight: 0.13926347622760177
Term simplicity Weight: 0.6864110707738222
```

```
**************************************************
Query in vector representation based on W2 Function
Query Term set: treatment simplicity do good exist result entry dynamics re
realistic effect consideration basic combine relative
[0.26946114950639083, 0.26946114950639083, 0.20711371021762737,
0.26946114950639083, 0.26946114950639083, 0.26946114950639083,
```

0.26946114950639083, 0.26946114950639083, 0.26946114950639083,
0.26946114950639083, 0.20711371021762737, 0.26946114950639083,
0.20711371021762737, 0.26946114950639083, 0.26946114950639083]

Document vector of query w.r.t to document 82
Term result Weight: 0.34677694269259135
Term entry Weight: 0.46045250095934515
Term re Weight: 0.47884545387944283
Term realistic Weight: 0.430998931702218
Term effect Weight: 0.34000609272366467
Term do Weight: 0.3702324343684484
==
==
Document vector of query w.r.t to document 274
Term exist Weight: 0.4123292302309615
Term result Weight: 0.383214167994135
Term entry Weight: 0.4319599429685115
Term re Weight: 0.4295544469680173
Term effect Weight: 0.37522820143635854
Term do Weight: 0.41379812584542014
==
==
Document vector of query w.r.t to document 927
Term exist Weight: 0.4135309910435696
Term result Weight: 0.39381864644343206
Term effect Weight: 0.387014497685837
Term consideration Weight: 0.41555819916241304
Term basic Weight: 0.4283484854284781
Term good Weight: 0.409814262661741
==
==
Document vector of query w.r.t to document 1346
Term result Weight: 0.3992243212664027
Term entry Weight: 0.5570855355804122
Term effect Weight: 0.38520759248657227
Term do Weight: 0.44184193272349664
Term good Weight: 0.4320491459710683
==
==
Document vector of query w.r.t to document 1296
Term result Weight: 0.39826427999412234
Term entry Weight: 0.4680864010978487
Term dynamics Weight: 0.4973169864292783
Term re Weight: 0.4651258568147891
Term effect Weight: 0.39826427999412234

Query 20:

****
Query in vector representation based on W1 Function
Query Term set: joule determine produce influence convection general induce current condition magnetohydrodynamic heating free under formally flow

[0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.06172053181522125]

Document vector based on W1 Function
==
Document vector of query w.r.t to document 500
Term joule Weight: 0.7889403929878446
Term convection Weight: 0.34533127022300236
Term magnetohydrodynamic Weight: 0.2880125828794442
Term heating Weight: 0.3147790465779767
Term free Weight: 0.1581663943652853
Term flow Weight: 0.0
Term influence Weight: 0.2264192256642739
==
==
Document vector of query w.r.t to document 268
Term convection Weight: 0.6355157324127964
Term general Weight: 0.2091969675839129
Term determine Weight: 0.1879100049856877
Term magnetohydrodynamic Weight: 0.47803540674439066
Term free Weight: 0.29107480447176154
Term flow Weight: 0.0
Term influence Weight: 0.4514463652929903
==
==
Document vector of query w.r.t to document 88
Term convection Weight: 0.5326274538870175
Term determine Weight: 0.26975787274811547
Term magnetohydrodynamic Weight: 0.557450791185683
Term free Weight: 0.24395058074778536
Term flow Weight: 0.0
Term influence Weight: 0.5227575107212893
==
==
Document vector of query w.r.t to document 270
Term convection Weight: 0.6131621640937811
Term general Weight: 0.28083656772032706
Term magnetohydrodynamic Weight: 0.6417388570655786
Term free Weight: 0.3651495886442463
Term flow Weight: 0.0
==
==
Document vector of query w.r.t to document 416
Term induce Weight: 0.5288514520103875
Term condition Weight: 0.24899269130026835
Term determine Weight: 0.2890715626758546
Term free Weight: 0.3218183849824162
Term produce Weight: 0.5088741867163817
Term influence Weight: 0.4606912222071785

****
Query in vector representation based on W2 Function

Query Term set: joule determine produce influence convection general induce current condition magnetohydrodynamic heating free under formally flow
[0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.266751700483594, 0.06172053181522123]

Document vector based on W2 Function
==
Document vector of query w.r.t to document 500
Term joule Weight: 0.5488089675518695
Term convection Weight: 0.38391646080681585
Term magnetohydrodynamic Weight: 0.35155973404372604
Term heating Weight: 0.3762539801226224
Term free Weight: 0.3176772214050866
Term flow Weight: 0.26170079092549736
Term influence Weight: 0.34183247816221674
==
==
Document vector of query w.r.t to document 268
Term convection Weight: 0.4581291441924918
Term general Weight: 0.3427708150329425
Term determine Weight: 0.33845086385938544
Term magnetohydrodynamic Weight: 0.39732857194117277
Term free Weight: 0.37259689589333334
Term flow Weight: 0.30031662827667627
Term influence Weight: 0.413749139245404
==
==
Document vector of query w.r.t to document 88
Term convection Weight: 0.4321068086700618
Term determine Weight: 0.3943410574275669
Term magnetohydrodynamic Weight: 0.4365937735879472
Term free Weight: 0.37992675782531793
Term flow Weight: 0.3358312486541184
Term influence Weight: 0.45829875006143894
==
==
Document vector of query w.r.t to document 123
Term condition Weight: 0.4029619107149789
Term determine Weight: 0.39144015320956466
Term heating Weight: 0.45060568840863446
Term under Weight: 0.3982118948943179
Term flow Weight: 0.3590490771728172
Term influence Weight: 0.44029747386058393
==
==
Document vector of query w.r.t to document 416
Term induce Weight: 0.42258752967152863
Term condition Weight: 0.392686373853483
Term determine Weight: 0.3969685502447882
Term free Weight: 0.4004673431139119
Term produce Weight: 0.42045308399307707
Term influence Weight: 0.41530503600662383
==

Indicate the rank, score, external document identifier, and headline, for each of the top 5 documents for each query. (5 points) 3. Identify which documents you think are relevant and non-relevant for each query. (10 points)

1. **Query:** what similarity laws must be obeyed when constructing aeroelastic models of heated high speed aircraft.

Indexed Query: similarity law must obey construct aeroelastic model heated high speed aircraft

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.304733039681148	cranfield0486	similarity laws for aerothermoelastic testing	Yes
2	1.2400651493043253	cranfield0573	viscous hypersonic similitude	No
3	1.1788510257219653	cranfield0051	theory of aircraft structural models subjected to aerodynamicheating and external loads	Yes
4	1.0934731891882459	cranfield0184	scale models for thermo-aeroelastic research	Yes
5	0.9817453829952771	cranfield1268	stable combustion of a high-velocity gas in a heatedboundary layer	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.993587862795172	cranfield0486	similarity laws for aerothermoelastic testing	Yes
2	2.5758577545506727	cranfield0051	theory of aircraft structural models subjected to	Yes

			aerodynamicheating and external loads	
3	2.5311458501965625	cranfield0573	viscous hypersonic similitude	No
4	2.3977266676417393	cranfield1268	stable combustion of a high-velocity gas in a heatedboundary layer	No
5	2.3152941262115214	cranfield0014	piston theory - a new aerodynamic tool for the aeroelastician	Yes

2. **Query:** what are the structural and aeroelastic problems associated with flight of high speed aircraft

Indexed Query : structural aeroelastic problem associate flight high speed aircraft.

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.6369725498154306	cranfield0012	some structural and aerelastic considerations of highspeed flight	Yes
2	1.0972712471408728	cranfield0014	piston theory - a new aerodynamic tool for the aeroelastician	Yes
3	1.0018440315812973	cranfield0051	theory of aircraft structural models subjected to aerodynamicheating and external loads	Yes
4	0.914888336589563	cranfield0172	some aerodynamic considerations of nozzle afterbodycombination	No
5	0.88936558444166	cranfield0746	aeroelastic problems in connection with high speedflight	Yes

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	3.6748649151234307	cranfield0012	some structural and aerelastic considerations of highspeed flight	Yes
2	2.7710836103918624	cranfield0014	piston theory - a new aerodynamic tool for the aeroelastician	Yes
3	2.741609144427345	cranfield0172	some aerodynamic considerations of nozzle afterbodycombination	Yes
4	2.5038368598562273	cranfield0051	theory of aircraft structural models subjected to aerodynamicheating and external loads	Yes
5	2.437336476061743	cranfield0746	aeroelastic problems in connection with high speedflight	No

3. **Query:** what problems of heat conduction in composite slabs have been solved so far.

Indexed Query : problem heat conduction composite slab solve so far

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.5132598204525294	cranfield0485	linear heat flow in a composite slab	Yes
2	1.423378909215864	cranfield0005	one-dimensional transient heat conduction into a	Yes

			double-layerslab subjected to a linear heat input for a small time	
3	1.287224946814654	cranfield0144	heat flow in composite slabs	Yes
4	1.1903958876565346	cranfield0399	conduction of heat in composite slabs	Yes
5	1.1111606538463936	cranfield0181	some problems on heat conduction in stratiform bodies	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.390727223681057	cranfield0485	linear heat flow in a composite slab	Yes
2	2.3529509728794125	cranfield0005	one-dimensional transient heat conduction into a double-layerslab subjected to a linear heat input for a small time	Yes
3	2.2870626244740517	cranfield0144	heat flow in composite slabs	Yes
4	2.2264329551353303	cranfield0399	conduction of heat in composite slabs	Yes
5	2.1711948723724293	cranfield0181	some problems on heat conduction in stratiform bodies	No

4. **Query:** can a criterion be developed to show empirically the validity of flow solutions for chemically reacting gas mixtures based on the simplifying assumption of instantaneous local chemical equilibrium

Indexed Query: can criterion develop to show empirically validity flow solution chemically react gas mixture base simplify assumption instantaneous local chemical equilibrium

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.0110697631013665	cranfield0488	a reaction-rate parameter for gasdynamics of a chemicallyreacting gas mixture	Yes
2	1.8662530809312636	cranfield0166	flow of chemically reacting gas mixtures	Yes
3	1.8525566983219404	cranfield1061	turbulent mixing of a rocket exhaust jet with a supersonic stream includingchemical reactions	No
4	1.4503790890749628	cranfield0185	some possibilities of using gas mixtures other than inaerodynamic research	Yes
5	1.3103938351109892	cranfield1255	the flow about a charged body moving in the lower atmosphere	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	4.422874867453964	cranfield0166	flow of chemically reacting gas mixtures	Yes
2	4.2518370927245055	cranfield1061	turbulent mixing of a rocket exhaust jet with a supersonic stream	No

			includingchemical reactions	
3	4.134904687206209	cranfield1255	the flow about a charged body moving in the lower atmosphere	No
4	3.703481072232555	cranfield0488	a reaction-rate parameter for gasdynamics of a chemicallyreacting gas mixture	No
5	3.6957788161815492	cranfield0575	atomic recombination in a hypersonic wind tunnel nozzle	No

5. Query: what chemical kinetic system is applicable to hypersonic aerodynamic problems

Indexed Query: chemical kinetic system applicable to hypersonic aerodynamic problem

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	0.9150785216489181	cranfield0625	viscous and inviscid nonequilibrium gas flows	Yes
2	0.8777035175705494	cranfield1032	on the conservativeness of various distributed force systems	No
3	0.8764543378037825	cranfield0103	theory of mixing and chemical reaction in the opposedjet diffusion flame	Yes
4	0.7805822364310304	cranfield1296	non-equilibrium expansions of air with coupled chemicalreactions	Yes
5	0.7616873775722375	cranfield0943	compressible free shear layer with	No

			finite initial thickness	

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.2923220936115554	cranfield0625	viscous and inviscid nonequilibrium gas flows	Yes
2	2.0446112006147685	cranfield1032	on the conservativeness of various distributed force systems	No
3	1.8697452197017987	cranfield0401	inviscid hypersonic airflows with coupled non-equilibriumprocesses	Yes
4	1.8182678859312564	cranfield0163	an analysis of the corridor and guidance requirementsfor supercircular entry planetary atmospheres	No
5	1.8097526542674167	cranfield0342	effect of diffusion fields on the laminar boundarylayer	Yes

6. Query: what theoretical and experimental guides do we have as to turbulent couette flow behavior.

Indexed Query: theoretical experimental guide do we to turbulent couette flow behavior.

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.1675887106339362	cranfield0798	interaction between shock waves and boundary layers,	Yes

			with a note on theeffects of the interaction of the performance of supersonic intakes	
2	0.8993603786832793	cranfield0491	on the close relationship between turbulent plane-couette and pressure flows	Yes
3	0.7127544377593128	cranfield0315	scale effects at high subsonic and transonic speeds and methods for fixing transition in model experiments	Yes
4	0.7047500071357227	cranfield1122	on the role of initial imperfections in plastic bucklingof cylinders under axial compression	No
5	0.6922734489623406	cranfield0386	a generalised porous-wall ?couette type? flow	Yes

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.6720366655443137	cranfield0798	interaction between shock waves and boundary layers, with a note on the effects of the	Yes

			interaction of the performance of supersonic intakes	
2	2.2463827827916467	cranfield0121	a theory for base pressures in transonic and supersonic flow	No
3	2.0489584856055774	cranfield0491	on the close relationship between turbulent plane-couette and pressure flows	Yes
4	1.8887365328011523	cranfield0257	on turbulen flow between parallel plates	No
5	1.8850408277545456	cranfield1122	on the role of initial imperfections in plastic buckling of cylinders under axial compression	No

7. Query: is it possible to relate the available pressure distributions for an ogive forebody at zero angle of attack to the lower surface pressures of an equivalent ogive forebody at angle of attack

Indexed Query: possible to relate available pressure distribution ogive forebody at zero angle attack lower surface equivalent

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.1344931012845945	cranfield0492	prediction of ogive-forebody pressures at angles of attack	Yes

2	1.4839074041737566	cranfield0122	a simplified approximate method for the calculation of the pressurearound conical bodies of arbitrary shape in supersonic and hypersonic	Yes
3	1.306951301032603	cranfield0124	a summary of the supersonic pressure drag of bodiesof revolution	Yes
4	1.164464689570279	cranfield0434	contributions of the wing panels to the forces andmoments of supersonic wing-body combinations at combined	Yes
5	1.1482495408386588	cranfield0232	accuracy of approximate methods for predicting pressureon pointed non-lifting bodies of revolution in supersonic	Yes

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	4.781644051266003	cranfield0492	prediction of ogive-forebody pressures at angles of attack	Yes

2	3.848517728849612	cranfield0122	a simplified approximate method for the calculation of the pressurearound conical bodies of arbitrary shape in supersonic and hypersonic	Yes
3	3.3138856682622104	cranfield0124	a summary of the supersonic pressure drag of bodiesof revolution	Yes
4	3.276267275370309	cranfield0232	accuracy of approximate methods for predicting pressureon pointed non-lifting bodies of revolution in supersonic	Yes
5	3.1249294756646653	cranfield0695	some experiments relating to the problem of simulation of hot jetengines in studies of jet effects on adjacent surfaces at a free-stream	No

8. Query: what methods -dash exact or approximate -dash are presently available for predicting body pressures at angle of attack

Indexed Query: method dash exact approximate presently available predict body pressure at angle attack

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.3144537026328715	cranfield0122	a simplified approximate	Yes

			method for the calculation of the pressurearound conical bodies of arbitrary shape in supersonic and hypersonic	
2	1.177148792614924	cranfield0433	application of two dimensional vortex theory to theprediction of flow fields behind wings of wing-body	No
3	1.0309683589719965	cranfield0069	predicted shock envelopes about two types of vehiclesat large angles of attack	NO
4	1.0074268563423334	cranfield0124	a summary of the supersonic pressure drag of bodiesof revolution	Yes
5	0.9926655606607533	cranfield0292	rapid laminar boundary layer calculations by piece-wiseapplication of similar solutions	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	3.802436806193076	cranfield0122	a simplified approximate method for the calculation of the pressurearound	Yes

			conical bodies of arbitrary shape in supersonic and hypersonic	
2	3.575194973409031	cranfield0433	application of two dimensional vortex theory to theprediction of flow fields behind wings of wing-body	No
3	3.2475544402339946	cranfield0069	predicted shock envelopes about two types of vehiclesat large angles of attack	NO
4	3.2153449591158454	cranfield0124	a summary of the supersonic pressure drag of bodiesof revolution	Yes
5	3.1993774378491833	cranfield0292	rapid laminar boundary layer calculations by piece-wiseapplication of similar solutions	No

9. Query: papers on internal /slip flow/ heat transfer studies

Indexed Query: papers internal slip flow heat transfer study

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	0.8595657309970193	cranfield0550	laminar heat transfer in tubes	Yes

			under slip-flow conditions	
2	0.8452270356294818	cranfield0270	on combined free and forced convection laminar magneto hydrodynamic flow and heat transfer in channels with transverse	Yes
3	0.8012558658627659	cranfield0022	on slip-flow heat transfer to a flat plate	No
4	0.761835323406644	cranfield0021	on heat transfer in slip flow	Yes
5	0.7344113354235773	cranfield0571	heat transfer to flat plate in high temperature rarefied ultra-high mach number flow	Yes

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.453896875902639	cranfield0550	laminar heat transfer in tubes under slip-flow conditions	Yes
2	2.393438561028274	cranfield0045	an investigation of separated flows, part ii: flowin the cavity and heat transfer	No
3	2.3655109516106885	cranfield0270	on combined free and forced convection laminar magneto	No

			hydrodynamic flow and heat transfer in channels with transverse	
4	2.015541586437358	cranfield0021	on heat transfer in slip flow	Yes
5	1.9936747896756932	cranfield0022	on slip-flow heat transfer to a flat plate	Yes

10. Query: are real-gas transport properties for air available over a wide range of enthalpies and densities

Indexed Query: real gas transport property air available over wide range enthalpy density

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.443493325747987	cranfield0493	real-gas laminar boundary layer skin friction and heat transfer	Yes
2	1.2887143553816358	cranfield0302	approximations for the thermodynamic and transport properties of high temperature air	Yes
3	1.1412344281656839	cranfield0949	charts for equilibrium flow properties of air in hypervelocity nozzles	No
4	1.1398971070201307	cranfield1143	a one-foot hypervelocity shock tunnel in which high-enthalpyreal gas flows can be generated with flow times of	No
5	1.0191891775086133	cranfield0110	dynamics of a dissociating gas	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	3.089991442253159	cranfield0493	real-gas laminar boundary layer skin friction and heattransfer	Yes
2	3.0683666890865853	cranfield0302	approximations for the thermodynamic and transport properties of hightemperature air	No
3	2.754750935072834	cranfield1264	boundary layer transition and heat transfer in shocktubes	No
4	2.458331849952294	cranfield0583	influence coefficients for real gases	No
5	2.454472493986888	cranfield1010	free-flight measurements of the static and dynamic	No

11. Query: is it possible to find an analytical, similar solution of the strong blast wave problem in the newtonian approximation

Indexed Query: possible find analytical similar solution strong blast wave problem newtonian approximation

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.794997740207704	cranfield0495	on similar solutions for	Yes

			strong blast waves and theirapplication to steady hypersonic flow	
2	1.0895010643499317	cranfield0072	boundary layer behind shock or thin expansion wavemoving into stationary fluid	No
3	1.0065309305960948	cranfield0110	dynamics of a dissociating gas	Yes
4	1.0017331177495328	cranfield0572	boundary layer displacement and leading edge bluntness effects in high temperature hypersonic flow	No
5	1.0014225347159977	cranfield0262	the formation of a blast wave by a very intense explosion	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	4.176577581098091	cranfield0495	on similar solutions for strong blast waves and theirapplication to steady hypersonic flow	Yes
2	3.220533665778419	cranfield0072	boundary layer behind shock or thin expansion wavemoving into stationary fluid	No
3	2.7670323018433787	cranfield0110	dynamics of a dissociating gas	Yes
4	2.7281941179923628	cranfield0160	approximate analytical	No

			solutions for hypersonic flowpast slender power-law bodies	
5	2.720957918638547	cranfield0572	boundary layer displacement and leading edge bluntness effects in hightemperature hypersonic flow	No

12. Query: how can the aerodynamic performance of channel flow ground effect machines be calculated

Indexed Query: can aerodynamic performance channel flow ground effect machine calculate

Rank	Score	Document Identifier	Heading	Relevant?
1	1.5294688926700082	cranfield0624	cruise performance of channel-flow ground effect machines	Yes
2	1.0759256838540008	cranfield0650	some design problems of hovercraft	No
3	0.9516065684541233	cranfield0506	a note on havelock's shallow-water wave-resistancecurves	No
4	0.8615306092199141	cranfield0966	on fully developed channel flows,. some solutions and limitations, andeffects of compressibility, variable properties, and body forces	Yes
5	0.798165886434041	cranfield0649	the hovercraft - a new concept in maritime transport	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	3.8282521014594373	cranfield0624	cruise performance of channel-flow ground effect machines	Yes
2	2.5714013064169188	cranfield0650	some design problems of hovercraft	No
3	2.427269355240453	cranfield0506	a note on havelock's shallow-water wave-resistancecurves	No
4	2.3653712491230543	cranfield0966	on fully developed channel flows,. some solutions and limitations, andeffects of compressibility, variable properties, and body forces	Yes
5	2.208293187058557	cranfield1339	calculation of flutter characteristics for finite-span swept or unsweptwings at subsonic and supersonic speeds by a modified strip analysis	No

13. Query: what is the basic mechanism of the transonic aileron buzz

Indexed Query: basic mechanism transonic aileron buzz

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.4544768376699229	cranfield0496	a theory of transonic aileron buzz, neglecting viscouseffects	Yes
2	0.9153966016488495	cranfield0520	wing-tail interference as a cause of 'magnus' effectson a finned missile	Yes
3	0.9088003277484116	cranfield0903	two dimensional transonic unsteady flow with shockwaves	Yes
4	0.6209305100972109	cranfield0643	an investigation of wing-aileron flutter using groundlaunched rocket models	No
5	0.5826096171330102	cranfield0440	compilation of information on the transonic attachmentof flows at the leading edge of airfoils	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.9819953134000479	cranfield0496	a theory of transonic aileron buzz, neglecting viscouseffects	Yes

2	1.6105685871041462	cranfield0903	two dimensional transonic unsteady flow with shockwaves	Yes
3	1.5616849976467948	cranfield0520	wing-tail interference as a cause of 'magnus' effectson a finned missile	Yes
4	1.1017604239486496	cranfield0313	on alternative forms for the basic equations of transonicflow theory	No
5	1.0960579589250758	cranfield0038	on the prediction of mixed subsonic/supersonic pressuredistributions	No

14. Query: papers on shock-sound wave interaction

Indexed Query: papers shock sound wave interaction

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.0125514325057652	cranfield0064	unsteady oblique interaction of a shock wave with planedisturbances	Yes
2	0.7273156406412618	cranfield0132	viscosity effects in sound waves of finite amplitude:in survey in mechanics	Yes
3	0.6822462204985782	cranfield0402	Magneto hydrodynamics shocks	Yes
4	0.6262650792884707	cranfield0065	convection of a pattern of vorticity through a shockwave	Yes
5	0.6182427427435748	cranfield0256	an experimental study of the glancing	Yes

			interaction between a shock wave and a turbulent boundary layer	

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.1358267327529483	cranfield0064	unsteady oblique interaction of a shock wave with planedisturbances	Yes
2	1.580957828107781	cranfield0132	viscosity effects in sound waves of finite amplitude:in survey in mechanics	Yes
3	1.5774848951118137	cranfield0256	Magneto hydrodynamics shocks	Yes
4	1.5474636969308408	cranfield0256	an experimental study of the glancing interaction between a shock wave and a turbulent boundary layer	Yes
5	1.5369393166408125	cranfield0065	convection of a pattern of vorticity through a shockwave	Yes

15. Query: material properties of photoelastic materials

Indexed Query: material property photoelastic

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	0.9814400351673731	cranfield0462	photo-thermo elasticity	Yes

2	0.5278165635813412	cranfield0463	physical properties of plastics for photo-thermoelasticinvestigation	Yes
3	0.5021192682912509	cranfield0082	theoretical investigation of the ablation of a glass-typeheat protection shield of varied material properties	No
4	0.4918313349879946	cranfield1025	note on creep buckling of columns	No
5	0.47787028332612697	cranfield0542	biot's variational principle in heat conduction	Yes

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.6804646020458995	cranfield0462	photo-thermoelasticity	Yes
2	1.0835365307645948	cranfield0463	physical properties of plastics for photo-thermoelasticinvestigation	Yes
3	1.059319026478168	cranfield1025	note on creep buckling of columns	No
4	1.0524766125302902	cranfield1099	a theoretical study of stagnation point ablation	No
5	1.031065355025996	cranfield0542	biot's variational principle in heat conduction.	Yes

16. Query: can the transverse potential flow about a body of revolution be calculated efficiently by an electronic computer

Indexed Query: can transverse potential flow about body revolution calculate efficiently electronic computer

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.691856145726558	cranfield0498	calculation of potential flow about bodies of revolutionhaving axes perpendicular to	Yes

			the free-stream direction	
2	1.11958004305033	cranfield0869	the calculation of transient temperature in turbineblades and tapered discs using biot's variational method	No
3	0.9290745774284778	cranfield0106	the transverse potential flow past a body of revolution	Yes
4	0.8894545667802227	cranfield0927	investigation of normal force distributions and wakevortex characteristics of bodies of revolution at supersonic	Yes
5	0.833678598189044	cranfield1043	on transverse vibrations of thin, shallow elastic shells	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	4.025993376519511	cranfield0498	calculation of potential flow about bodies of revolutionhaving axes perpendicular to the free-stream direction	Yes
2	2.7736220887806815	cranfield1255	the flow about a charged body moving in the lower atmosphere	No
3	2.7580796252653275	cranfield0869	the calculation of transient	No

			temperature in turbineblades and tapered discs using biot's variational method	
4	2.741374262710442	cranfield0927	investigation of normal force distributions and wakevortex characteristics of bodies of revolution at supersonic	Yes
5	2.529656503467089	cranfield0106	the transverse potential flow past a body of revolution	Yes

17. Query: can the three-dimensional problem of a transverse potential flow about a body of revolution be reduced to a two-dimensional problem

Indexed Query: can three dimensional problem transverse potential flow about body revolution reduce to two

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.1763513561680266	cranfield1108	a study of second-order supersonic flow theory	No
2	1.017171183893538	cranfield0916	the flow around oscillating low aspect ratio wings at transonicspeeds	No
3	0.9696977806267297	cranfield0373	the generalized expansion method and its applicationto bodies travelling at high supersonic airspeeds	Yes
4	0.9642893972911668	cranfield0801	experimental study of the equivalence of transonicflow about slender cone-cylinders of	No

			circular and elliptic	
5	0.9612389967486313	cranfield0336	simplified laminar boundary layer calculations forbodies of revolution and for yawed wings	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	3.749145522761513	cranfield1108	a study of second-order supersonic flow theory	No
2	3.61442430921363	cranfield0801	experimental study of the equivalence of transonicflow about slender cone-cylinders of circular and elliptic	No
3	3.557442067353824	cranfield0373	the generalized expansion method and its applicationto bodies travelling at high supersonic airspeeds	Yes
4	3.42929604827938	cranfield1248	an analytic extension of the shock-expansion method	No
5	3.2690585444997002	cranfield0916	the flow around oscillating low aspect ratio wings at transonicspeeds	No

18. Query: are experimental pressure distributions on bodies of revolution at angle of attack available

Indexed Query: experimental pressure distribution body revolution at angle attack available

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.0892061817112182	cranfield0197	pressure distributions on three bodies of revolutionto determine the effect of reynolds number up to and	No
2	1.0322662485718994	cranfield0234	a second order shock-expansion method applicable tobodies of revolution near zero lift	No
3	1.010542637262176	cranfield0498	calculation of potential flow about bodies of revolutionhaving axes perpendicular to the free-stream direction	Yes
4	0.9893115093425946	cranfield0248	the application of lighthill formula for numericalcalculation of pressure distributions on bodies of	No
5	0.9868454353932858	cranfield0225	elliptic cones alone and with wings at supersonic speeds	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	3.3337856418325202	cranfield0197	pressure distributions on three bodies of revolutionto	No

			determine the effect of reynolds number up to and	
2	3.2904343734970465	cranfield0498	calculation of potential flow about bodies of revolutionhaving axes perpendicular to the free-stream direction	No
3	3.253879937955909	cranfield0234	a second order shock-expansion method applicable tobodies of revolution near zero lift	Yes
4	3.22582860917774	cranfield1352	aerodynamic investigation of a parabolic body of revolutionat mach number of 1. 92 and some effects of an annular	No
5	3.191279943832937	cranfield0927	investigation of normal force distributions and wakevortex characteristics of bodies of revolution at supersonic	No

19. Query: does there exist a good basic treatment of the dynamics of re-entry combining consideration of realistic effects with relative simplicity of results

Indexed Query: do exist good basic treatment dynamics re entry combine consideration realistic effect relative simplicity result

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.3977868446267285	cranfield0082	theoretical investigation of the ablation of a glass-type heat protection shield	No

			of varied material properties	
2	0.9162206980562813	cranfield1119	plastic stability theory of thin shells	No
3	0.8898647852655259	cranfield0274	analysis of quartz and teflon shields for a particularre-entry mission	Yes
4	0.8877631248237463	cranfield1296	non-equilibrium expansions of air with coupled chemicalreactions	No
5	0.8633580814969877	cranfield1279	sublimation in a hypersonic environment	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.948995099742654	cranfield0082	theoretical investigation of the ablation of a glass-typeheat protection shield of varied material properties	No
2	2.7066737514572283	cranfield0274	analysis of quartz and teflon shields for a particularre-entry mission	Yes
3	2.596093752187897	cranfield0927	investigation of normal force distributions and wakevortex characteristics of bodies of revolution at supersonic	No
4	2.4276186053633433	cranfield1346	modulated entry	No

5	2.3359402915051994	cranfield1296	non-equilibrium expansions of air with coupled chemicalreactions	Yes

19. Query: does there exist a good basic treatment of the dynamics of re-entry combining consideration of realistic effects with relative simplicity of results

Indexed Query: do exist good basic treatment dynamics re entry combine consideration realistic effect relative simplicity result

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	1.3977868446267285	cranfield0082	theoretical investigation of the ablation of a glass-type heat protection shield of varied material properties	No
2	0.9162206980562813	cranfield1119	plastic stability theory of thin shells	No
3	0.8898647852655259	cranfield0274	analysis of quartz and teflon shields for a particularre-entry mission	Yes
4	0.8877631248237463	cranfield1296	non-equilibrium expansions of air with coupled chemicalreactions	No
5	0.8633580814969877	cranfield1279	sublimation in a hypersonic environment	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.948995099742654	cranfield0082	theoretical investigation of the ablation of a glass-typeheat protection shield of varied material properties	No
2	2.7066737514572283	cranfield0274	analysis of quartz and teflon shields for a particularre-entry mission	Yes
3	2.596093752187897	cranfield0927	investigation of normal force distributions and wakevortex characteristics of bodies of revolution at supersonic	No
4	2.4276186053633433	cranfield1346	modulated entry	No
5	2.3359402915051994	cranfield1296	non-equilibrium expansions of air with coupled chemicalreactions	Yes

20. Query : has anyone formally determined the influence of joule heating, produced by the induced current, in magnetohydrodynamic free convection flows under general conditions

Indexed Query : anyone formally determine influence joule heating produce induce current magnetohydrodynamic free convection flow under general condition

W1 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	2.0877887188421616	cranfield0500	joule heating in magnetohydrodynamic free-convectionflows	Yes
2	1.3111595747249682	cranfield0268	several magnetohydrodynamic free-convection solutions	Yes
3	1.0561131492283595	cranfield0088	magnetohydrodynamic free-convection pipe flow	Yes
4	1.0284897906534063	cranfield0270	on combined free and forced convection laminar magnetohydrodynamicflow	No

			and heat transfer in channels with transverse	
5	0.8676474169737216	cranfield0416	methods of boundary-layer control for postponing and alleviatingbuffeting and other effects of shock-induced separation	No

W2 Function:

Rank	Score	Document Identifier	Heading	Relevant?
1	3.946109026094344	cranfield0500	joule heating in magnetohydrodynamic free-convectionflows	Yes
2	3.4941016399858738	cranfield0268	several magnetohydrodynamic free-convection solutions	Yes
3	2.902765488314025	cranfield0088	magnetohydrodynamic free-convection pipe flow	Yes
4	2.721150231042363	cranfield0123	the downstream influence of mass transfer at the noseof a slender cone	No
5	2.6753140541895135	cranfield0416	methods of boundary-layer control for postponing and alleviating buffeting and other effects of shock-induced separation	No

4. Describe why the top-ranked non-relevant document for each query did not get a lower score.

The top-ranked non-relevant document for each query didn't get a low score because the ranking is done based on the statistical weight functions. Not based on the context. So if the more words in the documents matches with the words in the queries then the document will get more score irrespective of the context.

5. **Briefly discuss the different effects you notice with the two weighting schemes, either on a query-by-query basis or overall, whichever is most illuminating. For example, you can point out that the weighting scheme seems to be working for this query as well as a list of other queries, but not for some other queries you have noticed. Try to explain why it works and why it does not work.(5 points)**

Both the weight schemes generates almost similar results in terms of no. of relevant and irrelevant documents for the cranfield collections.

Comparatively, W2 functions seems to perform well with respect to relevancy.

6. Describe the design decisions you made in building your ranking system. (5 points)

The retrieval system will read the query, eliminate stop-words, and generate the lemmas for the content words.

Then for each content word in the query search, the index for the documents containing the content word. Get the term frequency of the word along with the doclen and max_tf for each of the document.

Then the query vectors are calculated using the two weighting functions. Similarly, the document weight vectors with respect to each query's terms are calculated.

Then using this data determine scores for documents against the queries by summing the weights for every matching query-document term pair.

Then fetch the first five document which have the maximum score under each weighting scheme.