Assignment 3

1. **For each query, turn in the indexed form of the query, and the top 10 documents for the query under both weighting schemes. Indicate The rank , score, external document identifier and headline for each of the top 10 documents for each query**.

Query1 :- what similarity laws must be obeyed when constructing aeroelastic models of heated high speed aircraft

Stemmed Query :- law model aeroelast speed obei heat must aircraft high construct similar

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.318446755084308 | 486 | cranfield0486 | similarity laws for aerothermoelastic testing .

2 | 1.2612978368599552 | 51 | cranfield0051 | theory of aircraft structural models subjected to aerodynamic heating and external loads .

3 | 1.1411348967712236 | 573 | cranfield0573 | viscous hypersonic similitude .

4 | 1.0842073282025575 | 329 | cranfield0329 | various aerodynamic characteristics in hypersonic rarefied gas flow .

5 | 1.0504693310157893 | 12 | cranfield0012 | some structural and aerelastic considerations of high speed flight .

6 | 1.0401577308004128 | 184 | cranfield0184 | scale models for thermo-aeroelastic research .

7 | 0.9397800539026682 | 14 | cranfield0014 | piston theory - a new aerodynamic tool for the aeroelastician .

8 | 0.8643327809741252 | 576 | cranfield0576 | viscous and inviscid stagnation flow in a dissociated hypervelocity free stream .

9 | 0.8227125130368677 | 665 | cranfield0665 | on the theory of hypersonic gas flow with a power law shock wave .

10 | 0.7954308305374881 | 78 | cranfield0078 | an analytical treatment of aircraft propeller precession instability .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 3.400631960562515 | 486 | cranfield0486 | similarity laws for aerothermoelastic testing .

2 | 3.071188849142075 | 51 | cranfield0051 | theory of aircraft structural models subjected to aerodynamic heating and external loads .

3 | 2.6800975639890043 | 329 | cranfield0329 | various aerodynamic characteristics in hypersonic rarefied gas flow .

4 | 2.6538029697868817 | 576 | cranfield0576 | viscous and inviscid stagnation flow in a dissociated hypervelocity free stream .

5 | 2.554211347021333 | 12 | cranfield0012 | some structural and aerelastic considerations of high speed flight .

6 | 2.483583664214123 | 573 | cranfield0573 | viscous hypersonic similitude .

7 | 2.3160364254869155 | 14 | cranfield0014 | piston theory - a new aerodynamic tool for the aeroelastician .

8 | 2.271618887741089 | 1268 | cranfield1268 | stable combustion of a high-velocity gas in a heated boundary layer .

9 | 2.262233598233308 | 1263 | cranfield1263 | turbulent heat transfer through a highly cooled, partially dissociated boundary layer .

10 | 2.085072703779799 | 184 | cranfield0184 | scale models for thermo-aeroelastic research .

Query2 :- what are the structural and aeroelastic problems associated with flight of high speed aircraft

Stemmed Query :- aeroelast speed structur ar problem flight associ aircraft high

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.561126627875338 | 12 | cranfield0012 | some structural and aerelastic considerations of high speed flight .

2 | 1.0864304575099637 | 14 | cranfield0014 | piston theory - a new aerodynamic tool for the aeroelastician .

3 | 0.9348182146556732 | 51 | cranfield0051 | theory of aircraft structural models subjected to aerodynamic heating and external loads .

4 | 0.9249823350868551 | 746 | cranfield0746 | aeroelastic problems in connection with high speed flight .

5 | 0.9114348260855918 | 172 | cranfield0172 | some aerodynamic considerations of nozzle afterbody combination .

6 | 0.8764782873196737 | 1380 | cranfield1380 | the problem of obtaining high lift-drag ratios at supersonic speeds .

7 | 0.8253715961973181 | 1089 | cranfield1089 | aerodynamic characteristics of propeller-driven vtol aircraft .

8 | 0.8062928216485401 | 78 | cranfield0078 | an analytical treatment of aircraft propeller precession instability .

9 | 0.8016507280410682 | 141 | cranfield0141 | free-flight techniques for high speed aerodynamic research .

10 | 0.7956544184486836 | 792 | cranfield0792 | some low speed problems of high speed aircraft .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 4.035607915420399 | 12 | cranfield0012 | some structural and aerelastic considerations of high speed flight .

2 | 3.172649151606815 | 14 | cranfield0014 | piston theory - a new aerodynamic tool for the aeroelastician .

3 | 3.1442411046551895 | 172 | cranfield0172 | some aerodynamic considerations of nozzle afterbody combination .

4 | 3.1103448109627756 | 1380 | cranfield1380 | the problem of obtaining high lift-drag ratios at supersonic speeds .

5 | 2.8704033819597217 | 746 | cranfield0746 | aeroelastic problems in connection with high speed flight .

6 | 2.788059735531512 | 1089 | cranfield1089 | aerodynamic characteristics of propeller-driven vtol aircraft .

7 | 2.701030417722983 | 1263 | cranfield1263 | turbulent heat transfer through a highly cooled, partially dissociated boundary layer .

8 | 2.6981208879831042 | 486 | cranfield0486 | similarity laws for aerothermoelastic testing .

9 | 2.697880517781789 | 792 | cranfield0792 | some low speed problems of high speed aircraft .

10 | 2.601232379966049 | 364 | cranfield0364 | a method for analysing the insulating properties of the laminar compressible boundary layer .

Query3 :- what problems of heat conduction in composite slabs have been solved so far

Stemmed Query :- so composit slab far problem heat solv conduc

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.4887228578784824 | 485 | cranfield0485 | linear heat flow in a composite slab .

2 | 1.31292679628318 | 5 | cranfield0005 | one-dimensional transient heat conduction into a double-layer slab subjected to a linear heat input for a small time internal .

3 | 1.2622245159722063 | 144 | cranfield0144 | heat flow in composite slabs .

4 | 1.1636887709650567 | 399 | cranfield0399 | conduction of heat in composite slabs .

5 | 1.0866236912723466 | 181 | cranfield0181 | some problems on heat conduction in stratiform bodies .

6 | 1.0365449493708108 | 91 | cranfield0091 | periodic temperature distribution in a two-layer composite slab .

7 | 1.0142041159900412 | 90 | cranfield0090 | periodic temperature distributions in a two-layer composite slab .

8 | 0.922392698385041 | 579 | cranfield0579 | further developments of new methods in heat flow analysis .

9 | 0.8829699642741541 | 542 | cranfield0542 | biot's variational principle in heat conduction .

10 | 0.8301501888034101 | 1072 | cranfield1072 | ignition and combustion in a laminar mixing zone .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 2.363368127799815 | 485 | cranfield0485 | linear heat flow in a composite slab .

2 | 2.33997405945638 | 5 | cranfield0005 | one-dimensional transient heat conduction into a double-layer slab subjected to a linear heat input for a small time internal .

3 | 2.269977155221786 | 144 | cranfield0144 | heat flow in composite slabs .

4 | 2.2357985007708896 | 1072 | cranfield1072 | ignition and combustion in a laminar mixing zone .

5 | 2.2054652051373598 | 399 | cranfield0399 | conduction of heat in composite slabs .

6 | 2.1539555523384903 | 181 | cranfield0181 | some problems on heat conduction in stratiform bodies .

7 | 2.0007646736938582 | 542 | cranfield0542 | biot's variational principle in heat conduction .

8 | 1.9855665688712325 | 579 | cranfield0579 | further developments of new methods in heat flow analysis .

9 | 1.916703369906995 | 980 | cranfield0980 | a method of computing the transient temperature of thick walls from arbitrary variation of adiabatic-wall temperature and heat-transfer coefficient .

10 | 1.9034047856024716 | 584 | cranfield0584 | conduction of heat in a solid with a power law of heat transfer at its surface .

Query4 :- 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 uilibrium

Stemmed Query :- to assump valid empir can chemic show flow solution ga mixtur simplifi criterion base local instantan develop uilibrium react

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.5076954565575487 | 488 | cranfield0488 | a reaction-rate parameter for gasdynamics of a chemically reacting gas mixture .

2 | 1.491629490864855 | 1061 | cranfield1061 | turbulent mixing of a rocket exhaust jet with a supersonic stream including chemical reactions .

3 | 1.307897462299319 | 185 | cranfield0185 | some possibilities of using gas mixtures other than in aerodynamic research .

4 | 1.2835984574787276 | 166 | cranfield0166 | flow of chemically reacting gas mixtures .

5 | 1.1255828982035574 | 1275 | cranfield1275 | flow about an unsteadily rotating disc .

6 | 1.1050654118950785 | 435 | cranfield0435 | application of similar solutions to calculations of laminar heat transfer on bodies with yaw and large pressure gradients in high speed flow .

7 | 1.0739858983462174 | 1315 | cranfield1315 | performance estimates for the rae 6in . high-pressure shock tube .

8 | 1.05800595062531 | 1255 | cranfield1255 | the flow about a charged body moving in the lower atmosphere .

9 | 1.0084320465113592 | 1072 | cranfield1072 | ignition and combustion in a laminar mixing zone .

10 | 0.9827128169359577 | 167 | cranfield0167 | linearized flow of a dissociating gas .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 4.163742983092989 | 1061 | cranfield1061 | turbulent mixing of a rocket exhaust jet with a supersonic stream including chemical reactions .

2 | 4.044549138874528 | 435 | cranfield0435 | application of similar solutions to calculations of laminar heat transfer on bodies with yaw and large pressure gradients in high speed flow .

3 | 4.037306501866631 | 1255 | cranfield1255 | the flow about a charged body moving in the lower atmosphere .

4 | 3.81580161576604 | 329 | cranfield0329 | various aerodynamic characteristics in hypersonic rarefied gas flow .

5 | 3.519162039355647 | 562 | cranfield0562 | concerning the effect of compressibility on laminar boundary layers and their separation .

6 | 3.5006569569037436 | 917 | cranfield0917 | a method of calculating the short period longitudinal stability derivatives of a wing in linearised unsteady compressible flow .

7 | 3.4834413006452234 | 24 | cranfield0024 | theory of stagnation point heat transfer in dissociated air .

8 | 3.4116817905372008 | 166 | cranfield0166 | flow of chemically reacting gas mixtures .

9 | 3.3919813186424093 | 1248 | cranfield1248 | an analytic extension of the shock-expansion method .

10 | 3.2954668636816864 | 1085 | cranfield1085 | note on the convergence of numerical solutions of the navier-stokes equations .

Query5 :- what chemical kinetic system is applicable to hypersonic aerodynamic problems

Stemmed Query :- hyperson to system kinet chemic aerodynam problem applic

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 0.9703235729781029 | 401 | cranfield0401 | inviscid hypersonic airflows with coupled non-equilibrium processes .

2 | 0.89030178071575 | 625 | cranfield0625 | viscous and inviscid nonequilibrium gas flows .

3 | 0.8566238645971533 | 552 | cranfield0552 | chemical kinetics of high temperature air .

4 | 0.8550857691625249 | 103 | cranfield0103 | theory of mixing and chemical reaction in the opposed jet diffusion flame .

5 | 0.8140334902604474 | 163 | cranfield0163 | an analysis of the corridor and guidance requirements for supercircular entry planetary atmospheres .

6 | 0.787186044338758 | 1032 | cranfield1032 | on the conservativeness of various distributed force systems .

7 | 0.7626269383990576 | 1296 | cranfield1296 | non-equilibrium expansions of air with coupled chemical reactions .

8 | 0.7440059801678756 | 943 | cranfield0943 | compressible free shear layer with finite initial thickness .

9 | 0.7427353355340044 | 968 | cranfield0968 | rocket propulsion systems for interplanetary flight .

10 | 0.6522090774153017 | 1147 | cranfield1147 | heat transfer to bodies traveling at high speed in the upper atmosphere .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 2.7674672976175994 | 401 | cranfield0401 | inviscid hypersonic airflows with coupled non-equilibrium processes .

2 | 2.690105255100521 | 625 | cranfield0625 | viscous and inviscid nonequilibrium gas flows .

3 | 2.6445114997124404 | 163 | cranfield0163 | an analysis of the corridor and guidance requirements for supercircular entry planetary atmospheres .

4 | 2.3607381026506267 | 552 | cranfield0552 | chemical kinetics of high temperature air .

5 | 2.2288036945273797 | 981 | cranfield0981 | solutions to the heat-conduction equation with time dependent boundary conditions .

6 | 2.2071763229552155 | 342 | cranfield0342 | effect of diffusion fields on the laminar boundary layer .

7 | 2.18898950466769 | 344 | cranfield0344 | some experimental techniques in mass transfer cooling .

8 | 2.1531977445533217 | 1147 | cranfield1147 | heat transfer to bodies traveling at high speed in the upper atmosphere .

9 | 2.054909804788496 | 103 | cranfield0103 | theory of mixing and chemical reaction in the opposed jet diffusion flame .

10 | 2.0020362116097337 | 1032 | cranfield1032 | on the conservativeness of various distributed force systems .

Query6 :- what theoretical and experimental guides do we have as to turbulent couette flow behaviour

Stemmed Query :- to behaviour flow guid experiment do couett theoret turbul we

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 0.9856644383680025 | 798 | cranfield0798 | interaction between shock waves and boundary layers, with a note on the effects of the interaction of the performance of supersonic intakes .

2 | 0.8652554601172827 | 491 | cranfield0491 | on the close relationship between turbulent plane-couette and pressure flows .

3 | 0.8001810234897416 | 315 | cranfield0315 | scale effects at high subsonic and transonic speeds and methods for fixing transition in model experiments .

4 | 0.6496798464011168 | 257 | cranfield0257 | on turbulen flow between parallel plates .

5 | 0.6044879468582228 | 121 | cranfield0121 | a theory for base pressures in transonic and supersonic flow .

6 | 0.5832545339450688 | 344 | cranfield0344 | some experimental techniques in mass transfer cooling .

7 | 0.5549997620861319 | 296 | cranfield0296 | notes on waves through gases at pressures small compared with the magnetic pressure, with applications to upper atmosphere aerodynamics .

8 | 0.5353449732939978 | 160 | cranfield0160 | approximate analytical solutions for hypersonic flow past slender power-law bodies .

9 | 0.5352494613237747 | 148 | cranfield0148 | on displacement thickness .

10 | 0.534027721496483 | 1075 | cranfield1075 | an experimental and theoretical investigation of second-order supersonic wing-body interference, for a non-lifting body with wings at incidence

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 2.6716615624655975 | 121 | cranfield0121 | a theory for base pressures in transonic and supersonic flow .

2 | 2.6390051536635823 | 798 | cranfield0798 | interaction between shock waves and boundary layers, with a note on the effects of the interaction of the performance of supersonic intakes .

3 | 2.432534003325743 | 491 | cranfield0491 | on the close relationship between turbulent plane-couette and pressure flows .

4 | 2.2768658137902165 | 257 | cranfield0257 | on turbulen flow between parallel plates .

5 | 2.2593298171685148 | 315 | cranfield0315 | scale effects at high subsonic and transonic speeds and methods for fixing transition in model experiments .

6 | 2.22751289054363 | 287 | cranfield0287 | some theoretical low-speed loading characteristics of swept wings in roll and sideslip .

7 | 2.2233964110756457 | 767 | cranfield0767 | mathematical techniques applying to the thermal fatigue behaviour of high temperature alloys .

8 | 2.2172894246793007 | 344 | cranfield0344 | some experimental techniques in mass transfer cooling .

9 | 2.212734658630787 | 1374 | cranfield1374 | theoretical analysis of turbulent mixing of reactive gases with application to supersonic combustion of hydrogen .

10 | 2.2059679655437185 | 610 | cranfield0610 | corner interference effects .

Query7 :- 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

Stemmed Query :- to lower pressur at possibl avail zero forebodi distribu ogiv surfac equival relat angl attack

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 2.1268840220451253 | 492 | cranfield0492 | prediction of ogive-forebody pressures at angles of attack .

2 | 1.4716453974404289 | 122 | cranfield0122 | a simplified approximate method for the calculation of the pressure around conical bodies of arbitrary shape in supersonic and hypersonic flow .

3 | 1.2904483013331542 | 124 | cranfield0124 | a summary of the supersonic pressure drag of bodies of revolution .

4 | 1.2287404575173015 | 57 | cranfield0057 | applicability of the hypersonic similarity rule to pressure distributions which include the effects of rotation for bodies of revolution at zero angle of attack .

5 | 1.1998077641471745 | 373 | cranfield0373 | the generalized expansion method and its application to bodies travelling at high supersonic airspeeds .

6 | 1.159162758296069 | 434 | cranfield0434 | contributions of the wing panels to the forces and moments of supersonic wing-body combinations at combined angles .

7 | 1.1416696713431773 | 232 | cranfield0232 | accuracy of approximate methods for predicting pressure on pointed non-lifting bodies of revolution in supersonic flow .

8 | 1.1339080764908167 | 973 | cranfield0973 | interaction effects produced by jet exhausting laterally near base of ogive-cylinder model in supersonic main stream .

9 | 1.1291076931978798 | 56 | cranfield0056 | an analysis of the applicability of the hypersonic similarity law to the study of the flow about bodies of revolution at zero angle of attack .

10 | 1.1218204481477592 | 1040 | cranfield1040 | on transverse vibrations of thin, shallow elastic shells .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 5.181417623546759 | 492 | cranfield0492 | prediction of ogive-forebody pressures at angles of attack .

2 | 4.654903166503247 | 122 | cranfield0122 | a simplified approximate method for the calculation of the pressure around conical bodies of arbitrary shape in supersonic and hypersonic flow .

3 | 4.181605583011506 | 57 | cranfield0057 | applicability of the hypersonic similarity rule to pressure distributions which include the effects of rotation for bodies of revolution at zero angle of attack .

4 | 4.077317850397714 | 232 | cranfield0232 | accuracy of approximate methods for predicting pressure on pointed non-lifting bodies of revolution in supersonic flow .

5 | 4.0264364303488165 | 373 | cranfield0373 | the generalized expansion method and its application to bodies travelling at high supersonic airspeeds .

6 | 3.976272506786916 | 1104 | cranfield1104 | aerodynamic heating of blunt nose shapes at mach numbers up to 14 .

7 | 3.898360762651434 | 695 | cranfield0695 | some experiments relating to the problem of simulation of hot jet engines in studies of jet effects on adjacent surfaces at a free-stream mach number of 1.80 .

8 | 3.736296462047515 | 56 | cranfield0056 | an analysis of the applicability of the hypersonic similarity law to the study of the flow about bodies of revolution at zero angle of attack .

9 | 3.7205914401191715 | 1231 | cranfield1231 | hypersonic flow over an elliptic cone: theory and experiment .

10 | 3.708855833808488 | 124 | cranfield0124 | a summary of the supersonic pressure drag of bodies of revolution .

Query8 :- what methods -dash exact or approximate -dash are presently available for predicting body pressures at angle of attack

Stemmed Query :- pressur at ar avail approxim present bodi dash predict exact angl method attack

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.2831278066608283 | 122 | cranfield0122 | a simplified approximate method for the calculation of the pressure around conical bodies of arbitrary shape in supersonic and hypersonic flow .

2 | 1.1156864786711074 | 433 | cranfield0433 | application of two dimensional vortex theory to the prediction of flow fields behind wings of wing-body combinations at subsonic and supersonic speeds .

3 | 1.0204029563915713 | 69 | cranfield0069 | predicted shock envelopes about two types of vehicles at large angles of attack .

4 | 0.985094763009127 | 688 | cranfield0688 | tables of aerodynamic coefficients obtained from developed newtonian expressions for complete and partial conic and spheric bodies at combined angles of attack and sideslip with some comparisons with hypersonic experimental data .

5 | 0.9849821660286848 | 124 | cranfield0124 | a summary of the supersonic pressure drag of bodies of revolution .

6 | 0.9619726923082942 | 292 | cranfield0292 | rapid laminar boundary layer calculations by piece-wise application of similar solutions .

7 | 0.9524335741373261 | 234 | cranfield0234 | a second order shock-expansion method applicable to bodies of revolution near zero lift .

8 | 0.9492530729580877 | 1231 | cranfield1231 | hypersonic flow over an elliptic cone: theory and experiment .

9 | 0.9264110358236923 | 492 | cranfield0492 | prediction of ogive-forebody pressures at angles of attack .

10 | 0.9257174131022755 | 232 | cranfield0232 | accuracy of approximate methods for predicting pressure on pointed non-lifting bodies of revolution in supersonic flow .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 4.989867195436146 | 122 | cranfield0122 | a simplified approximate method for the calculation of the pressure around conical bodies of arbitrary shape in supersonic and hypersonic flow .

2 | 4.401644981984356 | 124 | cranfield0124 | a summary of the supersonic pressure drag of bodies of revolution .

3 | 4.3855845569866565 | 292 | cranfield0292 | rapid laminar boundary layer calculations by piece-wise application of similar solutions .

4 | 4.106641745982643 | 492 | cranfield0492 | prediction of ogive-forebody pressures at angles of attack .

5 | 4.063144666267767 | 1231 | cranfield1231 | hypersonic flow over an elliptic cone: theory and experiment .

6 | 4.055423959206632 | 248 | cranfield0248 | the application of lighthill formula for numerical calculation of pressure distributions on bodies of revolution at supersonic speed and zero angle of attack .

7 | 4.046024298091131 | 234 | cranfield0234 | a second order shock-expansion method applicable to bodies of revolution near zero lift .

8 | 4.026522109056714 | 232 | cranfield0232 | accuracy of approximate methods for predicting pressure on pointed non-lifting bodies of revolution in supersonic flow .

9 | 3.966643708429461 | 433 | cranfield0433 | application of two dimensional vortex theory to the prediction of flow fields behind wings of wing-body combinations at subsonic and supersonic speeds .

10 | 3.959869440906838 | 1104 | cranfield1104 | aerodynamic heating of blunt nose shapes at mach numbers up to 14 .

Query9 :- papers on internal /slip flow/ heat transfer studies

Stemmed Query :- transfer paper slip intern flow studi heat

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 0.9616169068141807 | 550 | cranfield0550 | laminar heat transfer in tubes under slip-flow conditions .

2 | 0.8989056342756414 | 21 | cranfield0021 | on heat transfer in slip flow .

3 | 0.7960904575583727 | 45 | cranfield0045 | an investigation of separated flows, part ii: flow in the cavity and heat transfer .

4 | 0.7341248927633179 | 22 | cranfield0022 | on slip-flow heat transfer to a flat plate .

5 | 0.7118972336773955 | 571 | cranfield0571 | heat transfer to flat plate in high temperature rarefied ultra-high mach number flow .

6 | 0.6604425397082113 | 306 | cranfield0306 | second approximation to laminar compressible boundary layer on flat plate in slip flow .

7 | 0.6249850464426547 | 102 | cranfield0102 | advantages and limitations of models .

8 | 0.6230253825563468 | 270 | cranfield0270 | on combined free and forced convection laminar magnetohydrodynamic flow and heat transfer in channels with transverse magnetic field .

9 | 0.6222114679571656 | 1215 | cranfield1215 | the effect of slip particularly for highly cooled walls .

10 | 0.6107741187496941 | 1204 | cranfield1204 | experimental effect of bluntness and gas rarefaction on drag coefficients and stagnation heat transfer on axisymmetric shapes in hypersonic flow .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 2.8981465220884646 | 550 | cranfield0550 | laminar heat transfer in tubes under slip-flow conditions .

2 | 2.825653012939778 | 45 | cranfield0045 | an investigation of separated flows, part ii: flow in the cavity and heat transfer .

3 | 2.464322074906357 | 21 | cranfield0021 | on heat transfer in slip flow .

4 | 2.2983946253531107 | 270 | cranfield0270 | on combined free and forced convection laminar magnetohydrodynamic flow and heat transfer in channels with transverse magnetic field .

5 | 2.2631296266850507 | 549 | cranfield0549 | experimental study of the velocity and temperature distribution in a high-velocity vortex-type flow .

6 | 2.212254675815723 | 572 | cranfield0572 | boundary layer displacement and leading edge bluntness effects in high temperature hypersonic flow .

7 | 2.20621972214644 | 489 | cranfield0489 | on calculation of the laminar separation point and results of certain flows .

8 | 2.17196758802403 | 1268 | cranfield1268 | stable combustion of a high-velocity gas in a heated boundary layer .

9 | 2.1295660977022473 | 89 | cranfield0089 | an investigation of separated flows, part i: the pressure field .

10 | 1.9802014742995138 | 22 | cranfield0022 | on slip-flow heat transfer to a flat plate .

Query10 :- are real-gas transport properties for air available over a wide range of enthalpies and densities

Stemmed Query :- enthalpi ar avail wide ga real over transport rang densiti air properti

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.4482667139470258 | 493 | cranfield0493 | real-gas laminar boundary layer skin friction and heat transfer .

2 | 1.2846530259889721 | 302 | cranfield0302 | approximations for the thermodynamic and transport properties of high temperature air .

3 | 1.1792793326953168 | 1143 | cranfield1143 | a one-foot hypervelocity shock tunnel in which high-enthalpy real gas flows can be generated with flow times of about 180 milliseconds .

4 | 1.1412344281656839 | 949 | cranfield0949 | charts for equilibrium flow properties of air in hypervelocity nozzles .

5 | 1.026244098016732 | 110 | cranfield0110 | dynamics of a dissociating gas .

6 | 0.9997274921069337 | 1010 | cranfield1010 | free-flight measurements of the static and dynamic

7 | 0.9798806887563501 | 1264 | cranfield1264 | boundary layer transition and heat transfer in shock tubes .

8 | 0.963098060523728 | 332 | cranfield0332 | similitude of hypersonic real-gas flows over slender bodies with blunted noses .

9 | 0.9589033190751117 | 1199 | cranfield1199 | theoretical investigations of a supersonic laminar boundary layer with foreign-gas injection .

10 | 0.952568208630763 | 541 | cranfield0541 | similitude of hypersonic flows over slender bodies in non-equilibrium dissociated gases .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 3.493844958772474 | 493 | cranfield0493 | real-gas laminar boundary layer skin friction and heat transfer .

2 | 3.4659536651799097 | 302 | cranfield0302 | approximations for the thermodynamic and transport properties of high temperature air .

3 | 3.1578036540749927 | 1264 | cranfield1264 | boundary layer transition and heat transfer in shock tubes .

4 | 2.8217368302212216 | 332 | cranfield0332 | similitude of hypersonic real-gas flows over slender bodies with blunted noses .

5 | 2.8163647601151656 | 541 | cranfield0541 | similitude of hypersonic flows over slender bodies in non-equilibrium dissociated gases .

6 | 2.799766413254085 | 583 | cranfield0583 | influence coefficients for real gases .

7 | 2.7793900757800394 | 110 | cranfield0110 | dynamics of a dissociating gas .

8 | 2.654664491444154 | 576 | cranfield0576 | viscous and inviscid stagnation flow in a dissociated hypervelocity free stream .

9 | 2.629300248357647 | 262 | cranfield0262 | the formation of a blast wave by a very intense explosion .

10 | 2.5968788147219453 | 1313 | cranfield1313 | on the flow in a reflected shock tunnel .

Query11 :- is it possible to find an analytical, similar solution of the strong blast wave problem in the newtonian approximation

Stemmed Query :- to analyt blast newtonian possibl problem approxim solution strong wave find similar

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.55369056956535 | 495 | cranfield0495 | on similar solutions for strong blast waves and their application to steady hypersonic flow .

2 | 1.1262152486512118 | 572 | cranfield0572 | boundary layer displacement and leading edge bluntness effects in high temperature hypersonic flow .

3 | 1.0539355833647288 | 25 | cranfield0025 | inviscid hypersonic flow over blunt-nosed slender bodies .

4 | 0.9767145918193316 | 72 | cranfield0072 | boundary layer behind shock or thin expansion wave moving into stationary fluid .

5 | 0.9456898709449721 | 556 | cranfield0556 | numerical comparison between exact and approximate theories of hypersonic inviscid flow past slender blunt nosed bodies .

6 | 0.9120170002152423 | 110 | cranfield0110 | dynamics of a dissociating gas .

7 | 0.9000417826566758 | 1310 | cranfield1310 | survey of inviscid hypersonic flow theory for geometrically slender shapes .

8 | 0.8698380494760506 | 262 | cranfield0262 | the formation of a blast wave by a very intense explosion .

9 | 0.8652756288163742 | 472 | cranfield0472 | waves in supersonic flow .

10 | 0.8578715270630276 | 1280 | cranfield1280 | wings with minimum drag due to lift in supersonic flow .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 4.039366043114713 | 495 | cranfield0495 | on similar solutions for strong blast waves and their application to steady hypersonic flow .

2 | 3.5490683467115662 | 572 | cranfield0572 | boundary layer displacement and leading edge bluntness effects in high temperature hypersonic flow .

3 | 3.2100906358724552 | 72 | cranfield0072 | boundary layer behind shock or thin expansion wave moving into stationary fluid .

4 | 3.1492052521316993 | 1280 | cranfield1280 | wings with minimum drag due to lift in supersonic flow .

5 | 3.124658051106315 | 110 | cranfield0110 | dynamics of a dissociating gas .

6 | 3.10448129115667 | 1375 | cranfield1375 | an approximate solution for the axisymmetric jet of a laminar compressible fluid .

7 | 2.831734205624616 | 472 | cranfield0472 | waves in supersonic flow .

8 | 2.7977951444934304 | 1186 | cranfield1186 | lift of slender delta wings according to newtonian theory .

9 | 2.789140786676832 | 28 | cranfield0028 | a note on the explosion solution of sedov with application to the newtonian theory of unsteady hypersonic flow .

10 | 2.7757507136798827 | 305 | cranfield0305 | hypersonic strong viscous interaction on a flat plate with surface mass transfer .

Query12 :- how can the aerodynamic performance of channel flow ground effect machines be calculated

Stemmed Query :- machin effect can aerodynam calcul ground perform flow channel

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.4346250623516292 | 624 | cranfield0624 | cruise performance of channel-flow ground effect machines .

2 | 1.0134815512054731 | 650 | cranfield0650 | some design problems of hovercraft .

3 | 0.9538879880593096 | 966 | cranfield0966 | on fully developed channel flows,. some solutions and limitations, and effects of compressibility, variable properties, and body forces .

4 | 0.9019937374850648 | 506 | cranfield0506 | a note on havelock's shallow-water wave-resistance curves .

5 | 0.7885461878416419 | 649 | cranfield0649 | the hovercraft - a new concept in maritime transport .

6 | 0.7706490354905798 | 704 | cranfield0704 | a systematic kernel function procedure for determining aerodynamic forces on oscillating or steady finite wings at subsonic speeds .

7 | 0.7507458763521977 | 792 | cranfield0792 | some low speed problems of high speed aircraft .

8 | 0.6887065335647155 | 325 | cranfield0325 | heat transfer to constant property laminar boundary layer flows with power function free stream velocity and wall temperature variation .

9 | 0.6385238747772601 | 1289 | cranfield1289 | numerical technique to lifting surface theory for calculation of unsteady aerodynamic forces due to continuous sinusoidal gusts on several wing planforms at sobsonic speeds .

10 | 0.633459328068205 | 329 | cranfield0329 | various aerodynamic characteristics in hypersonic rarefied gas flow .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 3.794068120191964 | 624 | cranfield0624 | cruise performance of channel-flow ground effect machines .

2 | 2.8008336594643084 | 966 | cranfield0966 | on fully developed channel flows,. some solutions and limitations, and effects of compressibility, variable properties, and body forces .

3 | 2.6165104814169244 | 792 | cranfield0792 | some low speed problems of high speed aircraft .

4 | 2.6104530897465006 | 917 | cranfield0917 | a method of calculating the short period longitudinal stability derivatives of a wing in linearised unsteady compressible flow .

5 | 2.598096177561392 | 329 | cranfield0329 | various aerodynamic characteristics in hypersonic rarefied gas flow .

6 | 2.5344874592756166 | 650 | cranfield0650 | some design problems of hovercraft .

7 | 2.403705141909092 | 506 | cranfield0506 | a note on havelock's shallow-water wave-resistance curves .

8 | 2.324660571450445 | 704 | cranfield0704 | a systematic kernel function procedure for determining aerodynamic forces on oscillating or steady finite wings at subsonic speeds .

9 | 2.2652056535465954 | 325 | cranfield0325 | heat transfer to constant property laminar boundary layer flows with power function free stream velocity and wall temperature variation .

10 | 2.2460699085356133 | 1289 | cranfield1289 | numerical technique to lifting surface theory for calculation of unsteady aerodynamic forces due to continuous sinusoidal gusts on several wing planforms at sobsonic speeds .

Query13 :- what is the basic mechanism of the transonic aileron buzz

Stemmed Query :- basic mechan buzz transon aileron

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.454476837669923 | 496 | cranfield0496 | a theory of transonic aileron buzz, neglecting viscous effects .

2 | 0.8716797684846711 | 903 | cranfield0903 | two dimensional transonic unsteady flow with shock waves .

3 | 0.8711359836106132 | 520 | cranfield0520 | wing-tail interference as a cause of 'magnus' effects on a finned missile .

4 | 0.620930510097211 | 643 | cranfield0643 | an investigation of wing-aileron flutter using ground launched rocket models .

5 | 0.5765750833820844 | 440 | cranfield0440 | compilation of information on the transonic attachment of flows at the leading edge of airfoils .

6 | 0.5624061934193467 | 313 | cranfield0313 | on alternative forms for the basic equations of transonic flow theory .

7 | 0.5429849842620897 | 199 | cranfield0199 | measurement of two dimensional derivatives on a wing-aileron-tab system .

8 | 0.5097975905299008 | 38 | cranfield0038 | on the prediction of mixed subsonic/supersonic pressure distributions .

9 | 0.5034486660993509 | 797 | cranfield0797 | a study of the effect of leading-edge modifications on the flow over a 50degree sweptback wing at transonic speeds .

10 | 0.4894172453833013 | 880 | cranfield0880 | the design and testing of supersonic flutter models .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 1.9829215419546817 | 496 | cranfield0496 | a theory of transonic aileron buzz, neglecting viscous effects .

2 | 1.5985297492211814 | 903 | cranfield0903 | two dimensional transonic unsteady flow with shock waves .

3 | 1.548113797058563 | 520 | cranfield0520 | wing-tail interference as a cause of 'magnus' effects on a finned missile .

4 | 1.0969341491613869 | 313 | cranfield0313 | on alternative forms for the basic equations of transonic flow theory .

5 | 1.0909948679395463 | 440 | cranfield0440 | compilation of information on the transonic attachment of flows at the leading edge of airfoils .

6 | 1.0736163290285696 | 38 | cranfield0038 | on the prediction of mixed subsonic/supersonic pressure distributions .

7 | 1.047428785066586 | 880 | cranfield0880 | the design and testing of supersonic flutter models .

8 | 1.0087937256043615 | 415 | cranfield0415 | the aerodynamic design of section shapes for swept wings .

9 | 0.9949749061227906 | 797 | cranfield0797 | a study of the effect of leading-edge modifications on the flow over a 50degree sweptback wing at transonic speeds .

10 | 0.902024206829404 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

Query14 :- papers on shock-sound wave interaction

Stemmed Query :- sound paper wave interac shock

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.0096521021818181 | 64 | cranfield0064 | unsteady oblique interaction of a shock wave with plane disturbances .

2 | 0.7431607228127396 | 798 | cranfield0798 | interaction between shock waves and boundary layers, with a note on the effects of the interaction of the performance of supersonic intakes .

3 | 0.7247566450266935 | 132 | cranfield0132 | viscosity effects in sound waves of finite amplitude: in survey in mechanics .

4 | 0.7229553053565791 | 170 | cranfield0170 | the interaction of a reflected shock wave with the boundary layer in a shock tube .

5 | 0.6827302605122024 | 439 | cranfield0439 | a factor affecting transonic leading edge flow separation .

6 | 0.6799592231997439 | 402 | cranfield0402 | magnetohydrodynamics shocks .

7 | 0.6661924505219364 | 1303 | cranfield1303 | air pressure on a cone moving at high speeds .

8 | 0.6510003902807132 | 572 | cranfield0572 | boundary layer displacement and leading edge bluntness effects in high temperature hypersonic flow .

9 | 0.6366392975759072 | 1313 | cranfield1313 | on the flow in a reflected shock tunnel .

10 | 0.6243849566997948 | 65 | cranfield0065 | convection of a pattern of vorticity through a shock wave .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 2.1341330377307597 | 64 | cranfield0064 | unsteady oblique interaction of a shock wave with plane disturbances .

2 | 1.977152741618743 | 170 | cranfield0170 | the interaction of a reflected shock wave with the boundary layer in a shock tube .

3 | 1.950725546101589 | 439 | cranfield0439 | a factor affecting transonic leading edge flow separation .

4 | 1.936796175518172 | 798 | cranfield0798 | interaction between shock waves and boundary layers, with a note on the effects of the interaction of the performance of supersonic intakes .

5 | 1.8936850559813647 | 1303 | cranfield1303 | air pressure on a cone moving at high speeds .

6 | 1.8714657789383697 | 1327 | cranfield1327 | on the propagation and structure of the blast wave .

7 | 1.8485842494390257 | 572 | cranfield0572 | boundary layer displacement and leading edge bluntness effects in high temperature hypersonic flow .

8 | 1.8283477251769278 | 1313 | cranfield1313 | on the flow in a reflected shock tunnel .

9 | 1.8039516145674925 | 329 | cranfield0329 | various aerodynamic characteristics in hypersonic rarefied gas flow .

10 | 1.5804205069970163 | 132 | cranfield0132 | viscosity effects in sound waves of finite amplitude: in survey in mechanics .

Query15 :- material properties of photoelastic materials

Stemmed Query :- materi photoelast properti

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 0.9768766129992472 | 462 | cranfield0462 | photo-thermoelasticity .

2 | 0.5234373519543578 | 463 | cranfield0463 | physical properties of plastics for photo-thermoelastic investigation .

3 | 0.49783231331858646 | 82 | cranfield0082 | theoretical investigation of the ablation of a glass-type heat protection shield of varied material properties at the stagnation point of a re-entering irbm .

4 | 0.4871409423502332 | 1025 | cranfield1025 | note on creep buckling of columns .

5 | 0.47386935786583695 | 542 | cranfield0542 | biot's variational principle in heat conduction .

6 | 0.4602277822992016 | 1043 | cranfield1043 | on transverse vibrations of thin, shallow elastic shells .

7 | 0.4375995650353729 | 1099 | cranfield1099 | a theoretical study of stagnation point ablation .

8 | 0.4322345147379937 | 1065 | cranfield1065 | a free-flight investigation of ablation of a blunt body to a mach number of 13 .1.

9 | 0.4203901887412942 | 1340 | cranfield1340 | method of controlling stiffness properties of a solid-construction model wing .

10 | 0.40267289507503223 | 982 | cranfield0982 | the temperature history in a thick skin subjected to laminar heating during entry into the atmosphere .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 1.674196139523385 | 462 | cranfield0462 | photo-thermoelasticity .

2 | 1.079403941014078 | 463 | cranfield0463 | physical properties of plastics for photo-thermoelastic investigation .

3 | 1.0584836851216357 | 1025 | cranfield1025 | note on creep buckling of columns .

4 | 1.0496350189787886 | 1099 | cranfield1099 | a theoretical study of stagnation point ablation .

5 | 1.029542069430941 | 542 | cranfield0542 | biot's variational principle in heat conduction .

6 | 1.0288761909174626 | 82 | cranfield0082 | theoretical investigation of the ablation of a glass-type heat protection shield of varied material properties at the stagnation point of a re-entering irbm .

7 | 1.0284600582918553 | 1043 | cranfield1043 | on transverse vibrations of thin, shallow elastic shells .

8 | 1.0201253491273332 | 1340 | cranfield1340 | method of controlling stiffness properties of a solid-construction model wing .

9 | 1.0015193310114294 | 1065 | cranfield1065 | a free-flight investigation of ablation of a blunt body to a mach number of 13 .1.

10 | 0.993497459532197 | 1027 | cranfield1027 | note on creep buckling of columns .

Query16 :- can the transverse potential flow about a body of revolution be calculated efficiently by an electronic computer

Stemmed Query :- revolu transvers can calcul about flow potenti bodi electron comput effici

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.5092395893334476 | 498 | cranfield0498 | calculation of potential flow about bodies of revolution having axes perpendicular to the free-stream direction .

2 | 1.0611682713902537 | 1255 | cranfield1255 | the flow about a charged body moving in the lower atmosphere .

3 | 1.0094033069846526 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

4 | 0.9463910259692787 | 869 | cranfield0869 | the calculation of transient temperature in turbine blades and tapered discs using biot's variational method .

5 | 0.9228649119763688 | 106 | cranfield0106 | the transverse potential flow past a body of revolution .

6 | 0.8869184664362049 | 976 | cranfield0976 | turbulent diffusion in the wake of a blunt nosed body at hypersonic speeds .

7 | 0.8858650460410636 | 1328 | cranfield1328 | the production of aerodynamic forces by heat addition on external surfaces of aircraft .

8 | 0.8536239940922229 | 231 | cranfield0231 | practical calculation of second-order supersonic flow past non-lifting bodies of revolution .

9 | 0.8131978736120025 | 704 | cranfield0704 | a systematic kernel function procedure for determining aerodynamic forces on oscillating or steady finite wings at subsonic speeds .

10 | 0.7777082028560971 | 266 | cranfield0266 | exact solution of the neumann problem . calculation for non- circulatory plane and axially symmetric flows about or within arbitrary boundaries .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 3.950801056764586 | 498 | cranfield0498 | calculation of potential flow about bodies of revolution having axes perpendicular to the free-stream direction .

2 | 3.341477698708289 | 1255 | cranfield1255 | the flow about a charged body moving in the lower atmosphere .

3 | 3.1710094682151158 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

4 | 2.864581985064427 | 231 | cranfield0231 | practical calculation of second-order supersonic flow past non-lifting bodies of revolution .

5 | 2.7751668549302493 | 266 | cranfield0266 | exact solution of the neumann problem . calculation for non- circulatory plane and axially symmetric flows about or within arbitrary boundaries .

6 | 2.7252476684101525 | 801 | cranfield0801 | experimental study of the equivalence of transonic flow about slender cone-cylinders of circular and elliptic cross section .

7 | 2.711340972199002 | 869 | cranfield0869 | the calculation of transient temperature in turbine blades and tapered discs using biot's variational method .

8 | 2.663371498165358 | 704 | cranfield0704 | a systematic kernel function procedure for determining aerodynamic forces on oscillating or steady finite wings at subsonic speeds .

9 | 2.648816790181895 | 1356 | cranfield1356 | secondary flow fields embedded in hypersonic shock layers .

10 | 2.618715951273754 | 225 | cranfield0225 | elliptic cones alone and with wings at supersonic speeds .

Query17 :- can the three-dimensional problem of a transverse potential flow about a body of revolution be reduced to a two-dimensional problem

Stemmed Query :- to revolu transvers can about problem flow potenti two dimension bodi three reduc

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.1483703721024423 | 1108 | cranfield1108 | a study of second-order supersonic flow theory .

2 | 0.9867049568330108 | 916 | cranfield0916 | the flow around oscillating low aspect ratio wings at transonic speeds .

3 | 0.9811447982523447 | 373 | cranfield0373 | the generalized expansion method and its application to bodies travelling at high supersonic airspeeds .

4 | 0.9642893972911668 | 801 | cranfield0801 | experimental study of the equivalence of transonic flow about slender cone-cylinders of circular and elliptic cross section .

5 | 0.9370102916608465 | 336 | cranfield0336 | simplified laminar boundary layer calculations for bodies of revolution and for yawed wings .

6 | 0.9319859416041769 | 1281 | cranfield1281 | turbulent heat transfer on blunt-nosed bodies in two-dimensional and general three-dimensional hypersonic flow .

7 | 0.9228649119763688 | 106 | cranfield0106 | the transverse potential flow past a body of revolution .

8 | 0.9012596690438117 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

9 | 0.9010816169329279 | 498 | cranfield0498 | calculation of potential flow about bodies of revolution having axes perpendicular to the free-stream direction .

10 | 0.8836436483665642 | 94 | cranfield0094 | the transverse curvature effect in compressible axially symmetric laminar boundary layer flow .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 4.142081055019146 | 1108 | cranfield1108 | a study of second-order supersonic flow theory .

2 | 4.017239269775078 | 801 | cranfield0801 | experimental study of the equivalence of transonic flow about slender cone-cylinders of circular and elliptic cross section .

3 | 3.9646128151888913 | 373 | cranfield0373 | the generalized expansion method and its application to bodies travelling at high supersonic airspeeds .

4 | 3.825124617155682 | 1248 | cranfield1248 | an analytic extension of the shock-expansion method .

5 | 3.6666174603721657 | 1301 | cranfield1301 | compressible boundary layers on bodies of revolution .

6 | 3.6538284012377398 | 916 | cranfield0916 | the flow around oscillating low aspect ratio wings at transonic speeds .

7 | 3.635528880754583 | 1281 | cranfield1281 | turbulent heat transfer on blunt-nosed bodies in two-dimensional and general three-dimensional hypersonic flow .

8 | 3.5746273819332055 | 266 | cranfield0266 | exact solution of the neumann problem . calculation for non- circulatory plane and axially symmetric flows about or within arbitrary boundaries .

9 | 3.550783228604795 | 94 | cranfield0094 | the transverse curvature effect in compressible axially symmetric laminar boundary layer flow .

10 | 3.525626427115879 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

Query18 :- are experimental pressure distributions on bodies of revolution at angle of attack available

Stemmed Query :- revolu bodi pressur experiment at avail angl ar attack distribu

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.0892061817112182 | 197 | cranfield0197 | pressure distributions on three bodies of revolution to determine the effect of reynolds number up to and including the transonic speed range .

2 | 1.0322662485718994 | 234 | cranfield0234 | a second order shock-expansion method applicable to bodies of revolution near zero lift .

3 | 1.010542637262176 | 498 | cranfield0498 | calculation of potential flow about bodies of revolution having axes perpendicular to the free-stream direction .

4 | 1.0053009453716086 | 225 | cranfield0225 | elliptic cones alone and with wings at supersonic speeds .

5 | 1.0033187099548075 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

6 | 0.9893115093425948 | 248 | cranfield0248 | the application of lighthill formula for numerical calculation of pressure distributions on bodies of revolution at supersonic speed and zero angle of attack .

7 | 0.9628803639455346 | 1352 | cranfield1352 | aerodynamic investigation of a parabolic body of revolution at mach number of 1. 92 and some effects of an annular supersonic jet exhausting from the base .

8 | 0.9236546255353493 | 56 | cranfield0056 | an analysis of the applicability of the hypersonic similarity law to the study of the flow about bodies of revolution at zero angle of attack .

9 | 0.8861960906632019 | 232 | cranfield0232 | accuracy of approximate methods for predicting pressure on pointed non-lifting bodies of revolution in supersonic flow .

10 | 0.8761821650409598 | 124 | cranfield0124 | a summary of the supersonic pressure drag of bodies of revolution .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 4.0932883411065175 | 498 | cranfield0498 | calculation of potential flow about bodies of revolution having axes perpendicular to the free-stream direction .

2 | 4.052967429156368 | 234 | cranfield0234 | a second order shock-expansion method applicable to bodies of revolution near zero lift .

3 | 4.023516839366538 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

4 | 3.9910790963781912 | 225 | cranfield0225 | elliptic cones alone and with wings at supersonic speeds .

5 | 3.7257532987348725 | 197 | cranfield0197 | pressure distributions on three bodies of revolution to determine the effect of reynolds number up to and including the transonic speed range .

6 | 3.7236290934054113 | 248 | cranfield0248 | the application of lighthill formula for numerical calculation of pressure distributions on bodies of revolution at supersonic speed and zero angle of attack .

7 | 3.6475146382675843 | 56 | cranfield0056 | an analysis of the applicability of the hypersonic similarity law to the study of the flow about bodies of revolution at zero angle of attack .

8 | 3.6282917160302937 | 1352 | cranfield1352 | aerodynamic investigation of a parabolic body of revolution at mach number of 1. 92 and some effects of an annular supersonic jet exhausting from the base .

9 | 3.626205897336072 | 1231 | cranfield1231 | hypersonic flow over an elliptic cone: theory and experiment .

10 | 3.6140700596829145 | 801 | cranfield0801 | experimental study of the equivalence of transonic flow about slender cone-cylinders of circular and elliptic cross section .

Query19 :- does there exist a good basic treatment of the dynamics of re-entry combining consideration of realistic effects with relative simplicity of results

Stemmed Query :- result treatment entri good re effect basic consider realist combin simplic doe rel exist dynam

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 1.3539436070017927 | 82 | cranfield0082 | theoretical investigation of the ablation of a glass-type heat protection shield of varied material properties at the stagnation point of a re-entering irbm .

2 | 1.0245296553043006 | 453 | cranfield0453 | the influence of two-dimensional stream shear on airfoil maximum lift .

3 | 0.9241608864453245 | 274 | cranfield0274 | analysis of quartz and teflon shields for a particular re-entry mission .

4 | 0.8987105063275596 | 164 | cranfield0164 | an approximate analytical method for studying entry into planetary atospheres .

5 | 0.8890569661117524 | 140 | cranfield0140 | the determination of turbulent skin friction by means of pitot tubes .

6 | 0.8722718431319632 | 1346 | cranfield1346 | modulated entry .

7 | 0.864294018145272 | 1279 | cranfield1279 | sublimation in a hypersonic environment .

8 | 0.8444309533342808 | 353 | cranfield0353 | the effect of helium injection at an axially symmetric stagnation point .

9 | 0.8211539234096619 | 1119 | cranfield1119 | plastic stability theory of thin shells .

10 | 0.8178911532074056 | 554 | cranfield0554 | generalized heat transfer formulas and graphs .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 2.937288161767261 | 82 | cranfield0082 | theoretical investigation of the ablation of a glass-type heat protection shield of varied material properties at the stagnation point of a re-entering irbm .

2 | 2.782493924193241 | 453 | cranfield0453 | the influence of two-dimensional stream shear on airfoil maximum lift .

3 | 2.7219469189290306 | 140 | cranfield0140 | the determination of turbulent skin friction by means of pitot tubes .

4 | 2.7197292386094927 | 274 | cranfield0274 | analysis of quartz and teflon shields for a particular re-entry mission .

5 | 2.5876034410296858 | 927 | cranfield0927 | investigation of normal force distributions and wake vortex characteristics of bodies of revolution at supersonic speeds .

6 | 2.452785041885007 | 1346 | cranfield1346 | modulated entry .

7 | 2.3585209655934487 | 353 | cranfield0353 | the effect of helium injection at an axially symmetric stagnation point .

8 | 2.3243107650902086 | 1296 | cranfield1296 | non-equilibrium expansions of air with coupled chemical reactions .

9 | 2.2781073983433524 | 1075 | cranfield1075 | an experimental and theoretical investigation of second-order supersonic wing-body interference, for a non-lifting body with wings at incidence

10 | 2.2719744704522293 | 44 | cranfield0044 | tip-bluntness effects on cone pressures at m=6.85.

Query20 :- has anyone formally determined the influence of joule heating, produced by the induced current, in magnetohydrodynamic free convection flows under general conditions

Stemmed Query :- joul condition gener magnetohydrodynam under convec produc flow heat ha free formal anyon determin current influenc induc

Top 10 documents according to W1

Rank | Score | DocId | Document Name | Headline

1 | 2.017785142939382 | 500 | cranfield0500 | joule heating in magnetohydrodynamic free-convection flows .

2 | 1.3801752674516465 | 268 | cranfield0268 | several magnetohydrodynamic free-convection solutions .

3 | 1.2535052012695538 | 270 | cranfield0270 | on combined free and forced convection laminar magnetohydrodynamic flow and heat transfer in channels with transverse magnetic field .

4 | 1.2203485167499313 | 88 | cranfield0088 | magnetohydrodynamic free-convection pipe flow .

5 | 1.1643380186633958 | 44 | cranfield0044 | tip-bluntness effects on cone pressures at m=6.85.

6 | 1.0883217781313728 | 416 | cranfield0416 | methods of boundary-layer control for postponing and alleviating buffeting and other effects of shock-induced separation .

7 | 1.0370488622723768 | 87 | cranfield0087 | free-convection magnetohydrodynamic flow past a porous flat plate .

8 | 0.8691829657757223 | 625 | cranfield0625 | viscous and inviscid nonequilibrium gas flows .

9 | 0.8682640034523712 | 798 | cranfield0798 | interaction between shock waves and boundary layers, with a note on the effects of the interaction of the performance of supersonic intakes .

10 | 0.8625502602712669 | 1371 | cranfield1371 | axisymmetric free mixing with swirl .

Top 10 documents according to W2

Rank | Score | DocId | Document Name | Headline

1 | 4.289693013173831 | 500 | cranfield0500 | joule heating in magnetohydrodynamic free-convection flows .

2 | 3.9859320128024223 | 44 | cranfield0044 | tip-bluntness effects on cone pressures at m=6.85.

3 | 3.93870877215252 | 268 | cranfield0268 | several magnetohydrodynamic free-convection solutions .

4 | 3.773840477833769 | 88 | cranfield0088 | magnetohydrodynamic free-convection pipe flow .

5 | 3.5852519896252395 | 416 | cranfield0416 | methods of boundary-layer control for postponing and alleviating buffeting and other effects of shock-induced separation .

6 | 3.477135682462049 | 375 | cranfield0375 | steady flow in the laminar boundary layer of a gas .

7 | 3.381800524002297 | 270 | cranfield0270 | on combined free and forced convection laminar magnetohydrodynamic flow and heat transfer in channels with transverse magnetic field .

8 | 3.138721225077304 | 625 | cranfield0625 | viscous and inviscid nonequilibrium gas flows .

9 | 3.113591240880646 | 123 | cranfield0123 | the downstream influence of mass transfer at the nose of a slender cone .

10 | 3.0595375227693644 | 1268 | cranfield1268 | stable combustion of a high-velocity gas in a heated boundary layer .

**2. Identify which documents returned by your code are relevant and non-relevant**.

Q1: What similarity laws must be obeyed when constructing aeroelastic models of heated high speed aircraft

Relevant Docs : 486,51,12,329,184

Not relevant : 573,14,1263,576,665, 1268

Q2: What are the structural and aeroelastic problems associated with flight of high speed aircraft

Relevant Docs: 12, 746, 172, 792, 1380,

Not Relevant: 14, 1089, 1263, 486, 78, 141, 364, 51

Q3: What problems of heat conduction in composite slabs have been solved so far

Relevant Docs: 485, 144, 5, 91, 399, 181, 485, 584

Not Relevant : 1072, 579, 542, 980

Q4: 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

Relevant Docs: 1061, 166, 488, 185, 167

Not relevant: 575, 167, 1315, 24, 1255, 435, 329

Q5: What chemical kinetic system is applicable to hypersonic aerodynamic problems

Relevant Docs : 401, 552, 968

Not Relevant : 103, 625, 163, 1296, 1032, 943, 981, 103, 342, 344, 1032

Q6:What theoretical and experimental guides do we have as to turbulent couette flow behaviour

Relevant Docs: 257, 798, 491, 315, 160, 1374

Non-Relevant Docs: 121, 344, 296, 148, 1075, 287, 767, 610

Q7: 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

Relevant Docs: 492, 122, 124, 56,

Non-Relevant Docs: 57, 373, 434, 973, 1040, 1104, 695, 1231

Q8: What methods -dash exact or approximate -dash are presently available for predicting body pressures at angle of attack

Relevant Docs: 122, 69, 124, 492, 232,

Non-Relevant Docs: 433, 688, 292, 234, 1231, 1104, 248

Q9: Papers on internal /slip flow/ heat transfer studies

Relevant Docs: 550, 21, 22, 571, 270,

Non-Relevant Docs: 45, 306, 102, 1215, 1204, 549, 572, 489, 1268, 89

Q10: Are real-gas transport properties for air available over a wide range of enthalpies and densities

Relevant Docs: 493, 302, 949, 332

Non-Relevant Docs: 1143, 110, 1010, 1264, 1199, 541, 576, 262, 1313

Q11: Is it possible to find an analytical, similar solution of the strong blast wave problem in the newtonian approximation

Relevant Docs: 495, 572, 262

Non Relevant Docs: 25, 556, 110, 1310, 1280, 110, 1186, 28, 305

Q12: How can the aerodynamic performance of channel flow ground effect machines be calculated

Relevant Docs: 624, 966

Non Relevant : 650, 917, 506, 792, 329, 749, 36, 325, 1221

Q13: What is the basic mechanism of the transonic aileron buzz

Relevant Docs: 496, 440

Non Relevant: 903, 520, 313, 38, 880, 415, 797, 927, 199, 520, 643, 38, 880, 313

Q14: Papers on shock-sound wave interaction

Relevant Docs: 64, 798, 170, 132

Non Relevant: 439, 572, 329, 1313, 256, 345, 335, 291, 1364, 291

Q15: Material properties of photoelastic materials

Relevant docs : 462, 463

Not Relevant : 1025,82,1043,1099,1065,542,1065,1340,1027

Q16: Can the transverse potential flow about a body of revolution be calculated efficiently by an electronic computer

Relevant Documents: 498, 1255, 106, 927

Non Relevant Documents: 869, 976, 1328, 231, 231, 704, 1356, 225

Q17: Can the three-dimensional problem of a transverse potential flow about a body of revolution be reduced to a two-dimensional problem

Relevant Documents: 106, 1281

Non Relevant Documents: 916, 373, 801, 336, 1281, 927, 498, 94

Q18: Are experimental pressure distributions on bodies of revolution at angle of attack available

Relevant Documents: 197, 927

Non Relevant Documents: 234, 373, 498, 225, 248, 1352, 56, 1231, 801

Q19: Does there exist a good basic treatment of the dynamics of re-entry combining consideration of realistic effects with relative simplicity of results

Relevant Documents:

Non Relevant Documents: 82, 453, 140, 274, 164, 140, 1346, 1279, 353, 1119, 927, 1296, 1075, 44

Q20: Has anyone formally determined the influence of joule heating, produced by the induced current, in magnetohydrodynamic free convection flows under general conditions

Relevant Documents: 500

Non Relevant Documents: 268, 270, 88, 44, 416, 87, 625, 798, 1371, 375, 1267

**3. 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.**

We can observe noteworthy differences by using weights W1 and W2 for the ranking of the documents. Generally observing the output, I observed that the weigh function W2 happens to give a better ranking of the documents. This is probably because weight function W1 gives more significance to the number of times (frequency) a word in the query occurs in a particular document. As a result a document with some of the words repeated multiple times gets a higher score and better ranking. Whereas Weight function W2 gives higher score to those documents which have more words from the query and also the number of times a word has repeated itself in the document. Thus the rankings given by W2 are superior.

**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 did not get a lower score because as described above W1 is directly proportional to the tf values, and indirectly proportional to the maxtf values.

W1 = (0.4 + 0.6 \* log (tf + 0.5) / log (maxtf + 1.0))\*

(log (collectionsize / df)/ log (collectionsize))

If df value is large, then W1 value is small, i.e. if a term is present in many documents, it didn’t get any weightage that its present in few documents.

Whereas if we decrease the maxtf, the value get decreased, i.e. if a term is present in a document closer to the max frequent term, it gets higher score

W2 = (0.4 + 0.6 \* (tf / (tf + 0.5 + 1.5 \* (doclen / avgdoclen))) \*

log (collectionsize / df)/log (collectionsize))

As we notice, maxTf is replaced by document length and average document length is constant. The df value has the same effect as that of W1.If there is a big document, then score decreases.

If there is a small document the score is less. If a term occurs in a small document then, it has more weightage than when it occurs in a bigger document.

**5. Describe the design decisions you made in building your system**

Program uses Porter.java file for stemming the Query

How the program handles:

A. Upper and lower case words (e.g. "People", "people", "Apple", "apple");

-> The program converts all tokens to lowercase.

B. Words with dashes (e.g. "1996-97", "middle-class", "30-year", "tean-ager")

-> The program splits the token on dashes .i.e middle-class will be treated as two separate words middle and class.

C. Possessives (e.g. "sheriff's", "university's")

-> The program removes all "'s" from token

D. Acronyms (e.g., "U.S.", "U.N.")

-> Program removes . and joins the letters of the acronym to become one word. e.g U.S. will become US ,etc.

Major algorithms and data structures.

- Used SAXParser to extract text from the file.

- Used HashMap for dictionary.

- Used LinkedList for posting.