



The CENTRE for EDUCATION
in MATHEMATICS and COMPUTING

Faculty of Mathematics
University of Waterloo
Waterloo, Ontario, Canada N2L 3G1

2001 Canadian Computing Competition Results

Sponsors:



take it to the nth

Before addressing the individual questions, it is appropriate to thank the many teachers who gave of their time to assist their students in participating in the competition, and for their time and effort in performing the initial grading of their students' programs. In order to allow the largest number of languages to be used in stage one, we must rely on assistance from our colleagues in the schools.

Problem J1 - Dressing Up

This problem was well done and could be easily coded using a couple of loops with counters.

Problem J2 - Mod Inverse

Determining if a mod inverse exists is an exercise in integer (or modular) arithmetic and can be done with a simple test loop.

Problem J3S1 - Keeping Score

The solution to this problem consists of initializing a values table for the counting cards and five totals, one for each suit and then one for the overall total.

Problem J4S2 - Spirals

Several approaches present themselves here. Two of them are: constructing an array along with routines to print the appropriate portions, and actually calculating the contents of the rows and printing them directly.

Problem J5S3 - Strategic Bombing

This question is really just finding the cut-edges of a graph which place vertices A and B in separate components of the graph. Solutions require the ability to find all simple paths between A and B in the graph, and then determine which single edges destroy all the paths upon their removal.

Problem S4 - Cookies

The problem was to find the diameter of the smallest circle which would contain every point in a given set. There are several approaches, but most require the finding of the circumcentre of a triangle. This is the point of intersection of the perpendicular bisectors of the sides. Several people incorrectly accepted the midpoint of (0, 0) to (5, 10) in the 4th test case as the centre of the circle. This gives a diameter of 11.18 but such a circle could not contain the vertices (0, 0), (5, 10) and (10, 0) at the same time. This illustrates that taking the maximum distance between two chips does not insure that the circle with that diameter will capture all the chips.

Problem S5 - Posts's Correspondence Problem

This can be a very difficult problem to program efficiently, but there are some properties which can short-cut the search when no solution exists. If no strings in A begin with the same letter as any string in B, there can be no solution. Also if all the strings in A or B are shorter than all the strings in the other set, then there is no solution.

One approach is to select a beginning string from each set and build onto the shorter string using the next character in the longer string as a start point. For example if $a_1 = abc$ and $b_1 = ab$, the next string from B must start with a c .

Junior Competitors

Students are listed in alphabetical order within each group / Dans chaque groupe, les élèves sont nommés en ordre alphabétiques.

Name Nom	School École	Location Endroit
Group 1 - Scores from 60 to 70		
Phillippe	Boulanger N.	Levis, QC
Andrew	Casey	Markham, ON
Charlton	Chow	Markham, ON
Michael	Cournoyea	Markham, ON
Cory	Fletcher	Gloucester, ON
Adam	Hill	Whitby, ON
Ronald	Li	Markham, ON
Loren	Segal	Cote St. Luc, QC
Edward	Sin	Markham, ON
Jeancharle	Thouin	Ottawa, ON
Cameron	Zwarich	Burlington, ON
Group 2 - Scores from 57 to 59		
Chris	Belanger	Belleville, ON
Robert	Biswas	Windsor, ON
Hirokazu	Dozono	Belleville, ON
Maciej	Dragan	Mississauga, ON
Michael	Fortin	St. Lambert, QC
Eric	Gagne	Levis, QC
Tom	Hazelton	Markham, ON
Xiao Xuan	Jin	Windsor, ON
Timothy	Leung	Markham, ON
Vladimir	Levin	North York, ON
Brian	Liu	Markham, ON
Wynne	Lui	Vancouver, BC
Jake	Machina	Windsor, ON
Cam	Mcdonald	St. Catharines, ON
Alec	Mills	Calgary, AB
Andrei	Rjeousski	Mississauga, ON
Irene	Wang	Toronto, ON
Arjun	Yogeswaran	Belleville, ON
Group 3 - Scores from 50 to 56		
John	Bilenki	Oakville, ON
Stephen	Choi	Agincourt, ON
Michael	Chuang	Burnaby, BC
Jeff	Desaulniers	Kitchener, ON
Richard	Farr	Guelph, ON
Daniil	Golod	North York, ON
Issac	Gordezky	Richmond Hill, ON
Chris	Ho	Markham, ON
Oleg	Ivrii	Toronto, ON
Kashan	Jafri	Mississauga, ON
Nima	Kamoosi	West Vancouver, BC
Pawel	Kosicki	Windsor, ON
Robert	Kosztyla	Kitchener, ON
Andrew	Lumb	West Vancouver, BC
Zenon	Parker	Alliston, ON
Brent	Pym	Nepean, ON
Scott	Quiring	Calgary, AB
Queenie	Shum	Calgary, AB
Justin	Soetmans	Kitchener, ON
Tom	St. Denis	Kanata, ON
Ujjwal	Verma	Markham, ON
Yifei	Wang	Windsor, ON
Cory	Wong	Markham, ON
Michael	Wong	Toronto, ON
Sahab	Yazdani	Thornhill, ON
Richard	Zadorozny	Ottawa, ON
John	Zhang	Calgary, AB
Ray	Zhao	Windsor, ON

Group 4 - Scores from 44 to 49

Herman	Au	Richmond Hill H.S.	Richmond Hill, ON
Yasir	Bilal	W.F. Herman S.S.	Windsor, ON
Corey	Brookes	Hugh Mcroberts S.S.	Richmond, BC
Tessa	Chaworth	Crofton House School	Vancouver, BC
Matthew	Cheung	Markville S.S.	Markham, ON
Peter	Colijn	Western Canada H.S.	Calgary, AB
Jason	Cote	Polyvalente De Levis	Levis, QC
Barry	Dowsett	St. Benedict C.S.S.	Cambridge, ON
Gerard	Escalante	Moscrop J.S.S.	Burnaby, BC
Allie	Henze	Crofton House School	Vancouver, BC
Joel	Jackson	Western Canada H.S.	Calgary, AB
Tyler	Krug Wilson	Holy Cross C.S.S.	Kingston, ON
Erica	Lai	Crofton House School	Vancouver, BC
Patrick	Lam	Thornhill S.S.	Thornhill, ON
Jeff	Lindquist	Markham D.H.S.	Markham, ON
Kyle	Martens	John F. Ross CVI	Guelph, ON
Amitava	Mukhopadhyia	Vincent Massey S.S.	Windsor, ON
Xitij	Patel	Gordon Graydon Memorial S.S.	Mississauga, ON
Brock	Pehar	St. Thomas Aquinas S.S.	Oakville, ON
David	Schacter	Bialik H.S.	Cote St. Luc, QC
Andrew	Scherkus	Oakville Trafalgar H.S.	Oakville, ON
Philippe	St Pierre	Cecep De La Gaspésie	Gaspé, QC
Matthew	Stephan	Thornhill S.S.	Thornhill, ON
Anna	Tiounina	Sir Sandford Fleming Academy	North York, ON
Peter	Todd	Woburn Collegiate Institute	Toronto, ON
Lily	Tung	Crofton House School	Vancouver, BC
Anandh	Venkateswar	Markville S.S.	Markham, ON
Paul	Walker	F.E. Madill S.S.	Wingham, ON
Carl	Wong	Western Canada H.S.	Calgary, AB
Jimmy	Wong	Hugh McRoberts S.S.	Richmond, BC
Vincent	Woo	Brother Andre C.H.S.	Markham, ON

Senior Competitors

Students are listed in alphabetical order within each group / Dans chaque groupe, les élèves sont nommés en ordre alphabétiques.

Name Nom	School École	Location Endroit
Gold Medallists		
John	Admanski	Waterloo C.I.
Marcin	Mika	Father Michael Goetz S.S.
Thomas	Ootjers	East Northumberland S.S.
William	Slofstra	Elmira D.S.S.
Xin	Zhang	Woburn Collegiate Institute
Silver Medallists		
Frank P. M.	Chu	Killarney S.S.
Blake	Dickie	George Elliot S.S.
Michael	Huang	Woburn Collegiate Institute
Roger	Mong	Don Mills C.I.
Liviu	Tancau	Don Mills C.I.
Bronze Medallists		
Saul	Bancroft	Thornhill S.S.
Paul	Bechard	Kingston C.V.I.
Sergei	Taguer	Earl Of March S.S.
Raymond	Tsang	St. Francis Xavier C.H.S.
Pau L.	Turner	Kingston C.V.I.
Alex	Xiang	Glenforest S.S.

Name Nom	School École	Location Endroit
Honourable Mention		
Mohammed	Ajmal	Woburn Collegiate Institute
Graeme D.	Baer	Toronto French School
John	Carbrey	Thornlea S.S.
Wojciech	Hlibowicki	Sir Oliver Mowat C.I.
Justin	Lee	St. Michael's College School
Chris	Lo	Philip Pocock C.S.S.
James	Martens	Danforth Coll. & Tech. Inst.
Sean	Mcintosh	Gordon Graydon Memorial S.S.
Aly	Merchant	Woburn Collegiate Institute
Sanjay	Patel	Univ. Of Toronto Schools
Peter	Quinsey	Vincent Massey S.S.
Igor	Rehak	Richview C.I.
Chris	Stephenson	Forest Heights C.I.
Markus	Svilans	Holy Trinity C.H.S.
Ali	Tavakoli	Agincourt C.I.
Daniel	Urquhart	J. Lloyd Crowe S.S.
Anthony	Xu	Woburn Collegiate Institute
Scores from 42 - 48		
Adnan	Ali	Agincourt C.I.
James	Barlow	Mount Douglas S.S.
Wissam	Bishara	Vincent Massey S.S.
Karl	Blass	Vincent Massey S.S.
Andrei	Borac	Home School
Dan H.	Burken	Sir Robert Borden H.S.
Jeffrey	Chadwick	St. Thomas Aquinas S.S.
Johnathon	Christie	Cardinal Carter S.S.
Bryan	Eyler	Beaver Brae S.S.
Bruce	Fontaine	London Central S.S.
Robert	Henry	Markville S.S.
David	Herzog	Cameron Heights C.I.
Sahand	Hormoz	Thornlea S.S.
Saeed	Jahed	Clarkson S.S.
Robert	Kitts	St. Matthew H.S.
Spencer	Lai	Streetsville S.S.
Eugene	Lam	Brother Andre C.H.S.
Talent	Lam	Markville S.S.
Luke	Lichty	Orillia D.C.&V.S.
Peter	Lloyd	Woburn Collegiate Institute
Avery	Miller	Sir Robert Borden H.S.
Vlad	Mnih	Father John Redmond H.S.
Andrew	Mo	Woburn Collegiate Institute
Bryce	Moore	Eastdale C.V.I.
Derek	Mulder	St. John's-Ravenscourt School
Sharvil	Nanavati	Hillfield-Strathallan College
Stefan	Pintilie	Crescent School
Andrew	Roth	Colonel By S.S.
Patrick	Rutledge	Westminster S.S.
Adin	Scannell	Georgetown D.H.S.
Arjuna	Sivasithamb	Woburn Collegiate Institute
William	Somers	Gloucester H.S.
Cezary	Swieton	Waterloo C.I.
Douglas	Thomas	Gloucester H.S.
Feng	Tian	Vincent Massey S.S.
Brian	Wodlinger	Thornlea S.S.
David	Wong	Woburn Collegiate Institute
Henry	Wong	St. Francis Xavier C.H.S.
Andrew	Woolsey	Westminster S.S.
Johnny	Yip	Markham D.H.S.
Peter	Yu	Markham D.H.S.
Scores from 41 - 35		
Antoine	Atallah	Champlain Regional College
Brandon	Aubie	St. Mary's H.S.
Arash	Behravan	Don Mills C.I.

Canadian Student Honour Roll

Palmarès des élèves à l'échelle nationale

Jason Alexander	Bond Bradley	Huron Park S.S.	Woodstock, ON
Jeffrey Carlos	Cassidy Castillo	Vancouver College H.S.	Vancouver, BC
Ronald Daly	Chan	Hillfield-Strathallan College	Hamilton, ON
Brian Chris	Chang	Lambrick Park S.S.	Victoria, BC
Keith Mike	Choi	Markville S.S.	Markham, ON
Vladan Chris	Chung	Erindale S.S.	Mississauga, ON
Chris Matt	Chui	Markville S.S.	Markham, ON
Lloyd Alan	Chung	St. Andrew's College	Aurora, ON
James James	Darmitz	Western Canada H.S.	Calgary, AB
Jeff Tyler	Djeric	Erindale S.S.	Mississauga, ON
Ha Ns Kenneth	Donaldson	Forest Heights C.I.	Kitchener, ON
Brian Jeremy	Eagar	Thomas A. Stewart S.S.	Peterborough, ON
Mark Paul	Elliot	London Central S.S.	London, ON
Warren Jon	Elliott	Kingston C.V.I.	Kingston, ON
Benoit Linus	Esagoonlian	Thornlea S.S.	Thornhill, ON
Shawn Victor	Grisdale	Huron Park S.S.	Woodstock, ON
Adam Adam	Harris	Centennial C. & V.I.	Guelph, ON
Jason Jonathan	Hause	St. David C.S.S.	Waterloo, ON
Gavin Brent W.J.	Hesse	Kenner C.V.I.	Peterborough, ON
Eamon Chris	Ho	Don Mills C.I.	Don Mills, ON
Rodney Tor	Hogg	M.M. Robinson H.S.	Burlington, ON
Serguei Ali	Hughes	Woburn Collegiate Institute	Toronto, ON
Samuel Joseph	Ilton	St. Thomas Aquinas S.S.	London, ON
Conor Nihar	Istoan	Waterloo C.I.	Waterloo, ON
David David	Koo Tze Mew	Philip Pocock C.S.S.	Mississauga, ON
Gary Reed	Langmaid	Markham D.H.S.	Markham, ON
Matthew Antonio	Larochelle	Champlain Regional College	St. Lambert, QC
Sarah Sarah	Lee	St. John's-Ravenscourt School	Winnipeg, MB
James David	Lee	Gloucester H.S.	Gloucester, ON
David Sarah	Leipnik	St. Mary's H.S.	Kitchener, ON
Sarah Zhen Yu	Lenart	Loyola C.S.S.	Mississauga, ON
Jonathan Jason	Lloyd Price	Western Canada H.S.	Calgary, AB
Jason Lakan	Lung	Univ. Of Toronto Schools	Toronto, ON
Kuo Bao Robert	Macdonald	Brother Andre C.H.S.	Markham, ON
Albert Alexander	Mackie	Monsignor Doyle C.S.S.	Cambridge, ON
Alfred Y. F. David	Mcdermott	Bracebridge-Muskoka Lakes S.S.	Bracebridge, ON
David Jason	Mcfadyen	M.M. Robinson H.S.	Burlington, ON
Jason Patrick	Milligan	Markville S.S.	Markham, ON
Kevin Kevin	Myklebust	Logan H.S.	Logan, USA
	Narajnyi	Glenforest S.S.	Mississauga, ON
	Navrozally	Markville S.S.	Markham, ON
	Ng	Markham D.H.S.	Markham, ON
	O Reilly	Holy Cross C.S.S.	Kingston, ON
	Ohara	St. Thomas Aquinas S.S.	Oakville, ON
	Pasala	Woburn Collegiate Institute	Toronto, ON
	Payne	South Delta S.S.	Delta, BC
	Pong	Agincourt C.I.	Agincourt, ON
	Riley	Richmond Hill H.S.	Richmond Hill, ON
	Robertson	Chatham-Kent S.S.	Chatham, ON
	Rodriguez	St. David C.S.S.	Waterloo, ON
	Rowe	St. Matthew H.S.	Orleans, ON
	Schofield	St. Matthew H.S.	Orleans, ON
	Sewell	Georgetown D.H.S.	Georgetown, ON
	Skinner	Holy Cross C.S.S.	Kingston, ON
	Song	Centennial C. & V.I.	Guelph, ON
	Stolle	St. Mary's C.S.S.	Hamilton, ON
	Stumpf	Mount Douglas S.S.	Victoria, BC
	Timmermans	St. Thomas Aquinas S.S.	London, ON
	Tomas	Brother Andre C.H.S.	Markham, ON
	Tong	Richview C.I.	Etobicoke, ON
	Walker	Richview C.I.	Etobicoke, ON
	Wong	St. Joseph S.S.	Mississauga, ON
	Wong	Agincourt C.I.	Agincourt, ON
	Wong	Thornhill S.S.	Thornhill, ON
	Wong	Markville S.S.	Markham, ON
	Wong	Agincourt C.I.	Agincourt, ON
	Wood	Cardinal Carter C.H.S.	Aurora, ON
	Xu	Waterloo C.I.	Waterloo, ON

Problem Averages

Moyenne par problèmes

Problem	Junior (all)	Junior (non-zero)	Senior (all)	Senior (non-zero)
J1	11.4	12.6	----	----
J2	10.6	12.4	----	----
S1J3	8.4	11.7	11.0	12.5
S2J4	5.5	10.3	8.7	11.6
S3J5	0.1	1.0	1.3	4.6
S4	----	----	4.4	8.5
S5	----	----	1.3	6.5

The averages denoted (all) in the above table include all students in the division.

The averages denoted (non-zero) in the above table include only students in the division who achieved a non-zero score on the problem.

There were 730 Senior Division competitors and 418 Junior Division Competitors.

Student Rankings

Classement des élèves

Junior Competitors

Senior Competitors

Rank/ Position	Score/ Note	Rank/ Position	Score/ Note	Rank/ Position	Score/ Note	Rank/ Position	Score/ Note	Rank/ Position	Score/ Note	Rank/ Position	Score/ Note
1	70	120	41	265	20	1	75	57	44	364	21
2	61	124	40	270	19	2	73	60	43	385	20
5	60	127	39	273	18	3	72	63	42	402	19
12	59	137	38	278	17	5	71	75	41	405	18
17	58	144	37	282	16	7	70	84	40	422	17
24	57	149	36	285	15	8	68	98	39	430	16
30	56	154	35	320	14	9	64	109	38	437	15
36	55	160	34	327	13	11	63	119	37	485	14
41	54	163	33	331	12	13	60	132	36	510	13
46	53	166	32	341	11	16	59	140	35	545	12
47	52	169	31	346	10	17	58	146	34	577	11
51	51	174	30	352	9	18	57	159	33	588	10
55	50	204	29	364	8	20	56	176	32	604	9
58	49	208	28	365	7	22	55	182	31	614	8
62	48	218	27	370	6	24	54	191	30	618	7
66	47	227	26	377	5	26	53	219	29	625	6
68	46	234	25	384	4	27	52	239	28	635	5
70	45	238	24	386	3	29	51	270	27	644	4
82	44	250	23	391	2	31	50	302	26	648	3
89	43	252	22	394	1	34	48	315	25	656	2
112	42	256	21	395	0	41	47	333	24	660	1
						47	46	344	23	662	0
						51	45	354	22		

2001 Canadian Computing Competition Committee

Jim Bowman
Waterloo Collegiate Institute

Gord Cormack (Chair)
Computer Science Department
University of Waterloo

Graeme Kemkes
University of Waterloo

Rich Clausi
Elmira District Secondary School

Barry Ferguson
University of Waterloo

Ian Munro
Computer Science Department
University of Waterloo

Donny Cheung
University of Waterloo

Sandy Graham
University of Waterloo

Troy Vasiga
University of Waterloo

