SuperCon2005

Sponsored by GSIC, Tokyo Institute of Technology

SUPER COMPUTING CONTEST 2005
FOR HIGH SCHOOL STUDENTS

Preliminaries Problem: "maximum repeated substring problem"

Write a program which maximizes the total length of repeated substrings for given string.

for 111001110011100111001001, answer is 11100,11100,11100,11100.
for 00101100000010110000101l001011, answer is 0010110000,0010110000.

Finals Problem: "Sport scheduling"

Write a program which decides the home-away allocation(ref. fig3)
for all-teams' league tournament, minimizing the total cost of whole teams transportations
given a cost matrix(ref. fig2).

	1	2	3	4	5	6
A	C	D	B	D	B	C
B	D	C	A	C	A	D
C	A	B	D	B	D	A
D	B	A	C	A	C	B

(team A fights team C on 1st day)

fig1. Time Table

	A	B	C	D
A	0	15	15	10
B	5	0	21	8
C	15	21	0	12
D	10	8	12	0

(transportation cost between team A and B is 15)

fig2. cost matrix

	1	2	3	4	5	6
A	+C	+D	-B	-D	+B	-C
B	-D	+C	+A	-C	-A	+D
C	-A	-B	+D	+B	-D	+A
D	+B	-A	-C	+A	+C	-B

+: home, -: away

fig3. home-away allocation

According to the above allocation, the total cost of team A is
5(day2→day3)+8(day3→day4)+10(day4→day5)+15(day5→day6)+15(day6→home)=53.

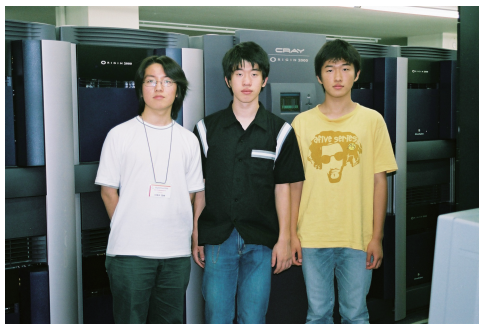
The Contest was performed with the following hardware/software conditions:
SGI Origin2000(400MHz, 256Processors, 256GB memory)
32 processors and 32GB memory are available for each contestants.

Results:

total cost is
21840 with 33.9seconds

cost matrix data of the final

	A	B	C	D	E	F	G	H
A	0	13	27	556	440	246	207	204
B	13	0	35	567	452	259	220	216
C	27	35	0	571	419	264	187	222
D	556	567	571	0	129	859	388	747
E	440	452	419	129	0	651	258	628
F	246	259	264	859	651	0	438	42
G	207	220	187	388	258	438	0	396
H	204	216	222	747	628	42	396	0



team Lunatic
Senior High School at Otsuka, University of Tsukuba

We are waiting for your challenge next year 2006.

For more information or comments, send an e-mail to: supercon@gsic.titech.ac.jp.

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