University Interscholastic League

Computer Science Competition

2002 Regional Programming Set

Judges' Answers

I. General Notes

1. Unless the exact formatting is specifically part of the problem, an answer should NOT be judged wrong for minor formatting variations such as indent/no indent, extra/no blank lines, and so forth.

2. The answer is only correct if their program successfully runs ALL of the judge's data sets for a given problem.

3. Note that the input data file for each problem begins with the examples from the problems, and then goes on to more complex cases. The testing is (by definition) not exhaustive in any sense and it is of course possible that an incorrect program will pass all of the tests provided.

II. Point Values and Names of Problems

Number	Name	Point Value
Problem 1	Let Your Fingers do the Talking	5
Problem 2	Well Written	5
Problem 3	Grandpa's Computer	6
Problem 4	It's Only Logical	4
Problem 5	What's in a Name?	6
Problem 6	A Little Light on the Subject	4
Problem 7	Calculate This	5
Problem 8	Make a Note of It	5
Problem 9	Truly Shocking	4
Problem 10	Which way did it go?	6
Total		**50**

Problem 1

Let Your Fingers do the Talking

5 Points

Program Name: tenprint.cpp **Input Data File: tenprint.dat**

Input File

```
20
LOORRLLROO Buck_Wheat
ORORROLLROL Darla_Rascal
LOORLLLRLR Spanky_Boyd
RRROLORLLR Al_Falfa
ROORRLLROO Froggy_Mann
RLLRLOLROO Weaser_Kidd
LOOLRLLRLR Butch_Bully
OORLLROLRO T_Cherlady
LLORRLROLR Stimey_Hatman
OORLLRORLO Cotton_Hatman
LLRLOOLORL Snow_White
OROLROLROL Dopey_Dwarf
RLRRRLRLLO Sneezy_Dwarf
OOLLOORLRO Bashful_Dwarf
ROLLLROLLL Pillsbury_Doughboy
LLLLLLLLLL Bugs_Bunny
RRRRRRRRRR Daffy_Duck
OOOOOOOOOO Yosemite_Sam
LORLORLORR Datas_Brother
ROLLOROLLO Nancys_Friend
ROLLLROLLL
LOO?RLLR??
ROLRRLRRLR
???R???R??
L???O?L???
```

Output to screen

```
Pillsbury_Doughboy

Buck_Wheat
Butch_Bully

No Suspects

Buck_Wheat
Darla_Rascal
Spanky_Boyd
Froggy_Mann
Weaser_Kidd
Daffy_Duck

Snow_White
Datas_Brother
```

Problem 2	Well Written	5 Points

Program Name: written.cpp **Input Data File: written.dat**

Input File

```
011221100,001133200
001222000,011122100
000111000,001112210
002211000,011232100
002232100,001132200
002222100,001222100
002222000,001132200
012222000,002232100
001221100,001322100
001121100,001222110
001111100,000221110
002111000,000112100
011112100,001211100
012222100,001132110
002212100,001122110
000000000,000000000
111111111,111111111
444444444,444444444
999999999,999999999
```

Output to screen

```
3
beep
7
6
9
beep
beep
beep
4
beep
1
1
beep
5
5
1
7
5
2
```

Problem 3	Grandpa's Computer	6 Points

Program Name: grandpa.cpp **Input Data File: grandpa.dat**

Input file

```
DATA 100
STOR 3
DATA 3
STOR 4
LOAD 3
ADD 4
STOR 5
LOAD 3
SUB 4
STOR 6
LOAD 3
MUL 4
STOR 7
LOAD 3
DIV 4
STOR 8
LOAD 3
MOD 4
STOR 9
LOAD 3
OUT
LOAD 4
OUT
LOAD 5
OUT
LOAD 6
OUT
LOAD 7
OUT
LOAD 8
OUT
LOAD 9
OUT
DATA 2
STOR 100
DATA 3
STOR 101
DATA 4
STOR 102
DATA 5
STOR 103
DATA 6
STOR 104
DATA 7
STOR 105
DATA 8
STOR 106
DATA 9
STOR 107
DATA 10
STOR 108
LOAD 108
OUT
```

```
ADD 107
OUT
SUB 106
OUT
MUL 105
OUT
DIV 104
OUT
ADD 103
OUT
SUB 102
OUT
MUL 101
OUT
DIV 100
OUT
MOD 105
OUT
```

Output to screen

```
100
3
103
97
300
33
1
10
19
11
77
12
17
13
39
19
5
```

Problem 4	It's Only Logical	4 Points

Program Name: logic.cpp **Input Data File: logic.dat**

Input File

```
01010101*+!-x*+
01001101*+!-x*+
11000101*+!xxxx
10101010xxxxxxx
10101010!!!!!!!
11110000**++-!x
00001000+++++++
11111111!!!!--x
00000000!!!!--x
00110000***-!x+
```

Output to screen

```
1
0
1
0
1
1
1
0
0
1
```

Problem 5	What's in a Name?	6 Points

Program Name: name.cpp **Input Data File: name.dat**

Input File

```
Mr. Michael Zimm
1234 Namovur Street
Asity, Texas 78923

This is a sample e-mail with 3 addresses in it.  However, your program
will only pick up on a couple of them.  For example, your program would
never be able to distinguish a line that had too many characters.  In fact,
Dr. Michaels, you cannot be assured that you will find all addresses no
matter how much you try.  Without the power of simple human intelligence,
I doubt if you will find even half of them.

Even this letter will throw you for a loop because only one of the following
is actually an address.

Ms. AlFalfa With forty one character name
8294 This is not an address
Wrong, Answer 12345

Dr Person
2 Bee missing period
in, Doctor 13523

 Mrs. Column 2
1 invalid address
Lubbock, Texas 79409

Mrs No State Name
1 Bad Address

Mr. Wright
37 Winnie Pooh Court
Calgary Alberta 15A325

Mr. Wright is the only correct answer.  The
other three are not addresses because they
violate 1 or more rules

Sincerely,

Mrs. Ima Hogg
2 Wiggs Way
Garland, Texas 77049
```

Output to screen

```
Mr. Michael Zimm
1234 Namovur Street
Asity, Texas 78923

Mr. Wright
37 Winnie Pooh Court
Calgary Alberta 15A325

Mrs. Ima Hogg
2 Wiggs Way
Garland, Texas 77049
```

Problem 6	A Little Light on the Subject	4 Points

Program Name: light.cpp **Input Data File: light.dat**

Input File

```
3.10 1.11 124.00
0.09 0.74 95.09
853.67 0.01 243.19
6.53 10.00 27.33
1.93 7.00 21.33
1.16 0.03 36.84
1000.00 0.03 250.00
```

Output to screen

```
13178.71
100.00
1132.93
109449.61
9655.10
0.32
12622.47
```

Problem 7	Calculate This	5 Points

Program Name: calc.cpp **Input Data File: calc.dat**

Input File

```
38 41
81 63
102 102
10 105
80 55
60 40
0 0
115 150
15 106
64 90
87 25
57 70
47 70
91 51
11 52
63 29
63 55
37 73
58 58
```

Output to screen

```
2
Panel
+
9
1
1
Panel
Panel
Panel
7
/
Panel
5
*
3
=
1
5
Panel
```

Problem 8

Make a Note of It

5 Points

Program Name: note.cpp **Input Data File: note.dat**

Input File

```
E Meet_at_locker_twelve! Amber
D SilNHofGv.?sNRnHXST Alfalfa
D tWpciWCPaRWAXEOEiUASrnXfQJ Sandra
D DhmoXadfQGftYJzL?JzM!MNq!M NEWS
E Simple_example_extraction Simple
D Nv.h_P!YeygCrcFgtYoGdcyghcyCegOEnahGteogacR LongLine
```

Output to screen

```
EYOultCPHxidOCLbBOHK!h
Where_is_Buckwheat?
Sandra_Bullock_Pretty_Girl
sjCANreXtfDSiWJabWJzwoQhwo
tHbjKDCEFC!hEERhtuQfSyGvY
Next_time_throw_the_dog_higher_into_the_air
```

Problem 9	Truly Shocking	4 Points

Program Name: shocking.cpp **Input Data File: shocking.dat**

Input File

```
1200 1800 124
800 75 120
2763 2351 10
6135 73 5
5 10 30
10 5 30
1719 3333 1000
```

Output to screen

```
74.400
10.286
4.597
0.059
20.000
10.000
659.739
```

Problem 10	Which way did it go?	6 Points

Program Name: router.cpp **Input Data File: router.dat**

Input File

```
14
226.76.*.* 226.76.27.1
143.*.*.* 98.24.52.1
115.74.*.* 115.74.*.1
225.8.15.* 225.8.*.1
225.*.*.* 225.14.9.1
9.*.*.* 9.1.1.1
157.19.230.* 226.76.27.1
27.18.43.18 27.18.43.18
27.*.*.* 27.*.*.1
187.32.42.* 226.75.18.1
36.36.36.36 36.36.36.36
36.*.*.* 36.36.36.35
237.12.*.* 9.99.*.*
226.*.*.* 2.2.6.*
9.87.65.210
115.75.87.83
115.74.9.28
143.87.82.81
226.75.76.76
36.36.36.36
36.36.36.37
236.235.23.12
97.23.238.23
226.81.45.4
```

Output to screen

```
9.1.1.1
Route to the bit bucket
115.74.9.1
98.24.52.1
2.2.6.76
36.36.36.36
36.36.36.35
Route to the bit bucket
Route to the bit bucket
2.2.6.4
```