

A+ Computer Science

October 2010

Computer Science Competition

Hands-On Programming Set

JUDGE'S PACKET

Number	Name	Point Value
Problem 1	Geometry	60
Problem 2	Copy Cat	60
Problem 3	Easy Code	60
Problem 4	Drawing Fun	60
Problem 5	Go Fish	60
Problem 6	Baseball Stats	60
Problem 7	Compound Interest	60
Problem 8	XM Scroll	60
Problem 9	Car Counter	60
Problem 10	Forest Mapper	60
Problem 11	Grass Mapper	60
Problem 12	Way 2 Hard	60
Total		720

0. DryRun

Program Name: DryRun.java

Input File: dryrun.dat

Example: Input file

```
8
history
algebra
chemistry
physics
computer science
you
me
everyone
```

Output to screen:

```
I like history.
I like algebra.
I like chemistry.
I like physics.
I like computer science.
I like you.
I like me.
I like everyone.
```

1. Geometry

Program Name: Geometry.java

Input File: geometry.dat

Example Input File

```
5
1
10
123.456
99.9
123456789
```

Output to screen:

```
SA = 12.566 V = 4.189
SA = 1256.637 V = 4188.790
SA = 191528.879 V = 7881796.437
SA = 125412.504 V = 4176236.396
SA = 191531327322835360.000 V = 78819475547284060000000000.000
```

Note: Using Math.PI should give identical rounding, which was given in the problem statement.

2. Copy Cat

Program Name: CopyCat.java

Input File: copycat.dat

Example Input File

```
This little light of mine,  
I'm going to let it shine.  
I've been working on the railroad  
All the livelong day.  
La la la let's live for today.  
Na na na nananana, nananana, Hey Judge.
```

Output to screen:

```
This little light of mine,  
I'm going to let it shine.  
I've been working on the railroad  
All the livelong day.  
La la la let's live for today.  
Na na na nananana, nananana, Hey Judge.
```

3. Easy Code

Program Name: EasyCode.java

Input File: easycode.dat

Example Input File

```
7  
i like history.  
this is a test of the emergency broadcast system.  
this is only a test.  
i cannot tell a lie!  
the quick brown fox jumped over the lazy crazy dog.  
i smell the blood of an englishman!  
do you smell something?
```

Output to screen:

```
i lkie hsoyitr.  
tihs is a tset of teh eegnymrec bodatracs sseytm.  
tihs is olny a tset.  
i cnoant tlel a lei!  
teh qikuc bonrw fxo jmeupd oevr teh lzay cayrz dgo.  
i selml teh bodlo of an egihanlsmn!  
do yuo selml smtigoehn?
```

4. Drawing Fun

Program Name: DrawingFun.java

Input File: no data file

Example Input File (none)

Output to screen:

```
U   U   III   L           CCCCCC   SSSSSS
U   U   I    L           C           S
U   U   I    L           C           SSSSSS
U   U   I    L           C           S
UUUUUU   III   LLLLLL   CCCCCC   SSSSSS
```

5. Go Fish

Program Name: GoFish.java

Input File: gofish.dat

Example Input file

```
4 5 6 8 J K A
3 6 9 10 J Q K
4
3
6
9
J
3
4
9
K
10
```

Output to screen:

```
GO FISH
GO FISH
HERE'S MY CARD
GO FISH
HERE'S MY CARD
GO FISH
GO FISH
GO FISH
HERE'S MY CARD
GO FISH
```

6. Baseball Stats

Program Name: Baseball.java

Input File: baseball.dat

Example Input file

```
9
holy cow
last night he hit 2 out of 3
but last week he only hit 3 for 11
last month the club hit only 24 out of 140 which
was the worst out of all teams in the league
I can hit 1 for 4 if I try to
or I can bat 7 out of 8 if I really, really try to
abcdefghijkl 3 out of 3 LMNOP
what for do I write this program if I get out of here
```

Output to screen:

```
holy cow
last night he hit 2 out of 3 (0.667)
but last week he only hit 3 for 11 (0.273)
last month the club hit only 24 out of 140 (0.171) which
was the worst out of all teams in the league
I can hit 1 for 4 (0.250) if I try to
or I can bat 7 out of 8 (0.875) if I really, really try to
abcdefghijkl 3 out of 3 (1.000) LMNOP
what for do I write this program if I get out of here
```

7. Compound Interest

Program Name: Compound.java

Input File: compound.dat

Example Input file

```
7
10000.00 5.00 20
10000.00 5.00 40
10000.00 10.00 20
10000.00 10.00 40
1.00 50.00 40
1.00 50.00 50
1.00 0.00 250
```

Output to screen:

```
$26532.98
$70399.89
$67275.00
$452592.56
$11057332.32
$637621500.21
$1.00
```

Note - In my solution, I used both the exponential equation and a loop. Both solutions agreed to the nearest cent on my computer, but you may manually judge if using PC^2 to check for close rounding.

8. XM Scroll

Program Name: XMScroll.java

Input File: xmscroll.dat

Example Input file

```
8
David Bowie
China Girl
U2
With or Without You
Depeche Mode
People are People
Michael Jackson
Thriller
Huey Lewis and the News
Power of Love
Hall and Oates
You Make My Dreams Come True
Bobby Brown
On Our Own
Don Henley
The End of the Innocence
```

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(Problem 8 contin.)

Output to screen:

David Bowie
China Girl

U2
With or Without
ith or Without Y
th or Without Yo
h or Without You

Depeche Mode
People are Peopl
eople are People

Michael Jackson
Thriller

Huey Lewis and t
Power of Love

Hall and Oates
You Make My Drea
ou Make My Dream
u Make My Dreams
Make My Dreams
Make My Dreams C
ake My Dreams Co
ke My Dreams Com
e My Dreams Come
My Dreams Come
My Dreams Come T
y Dreams Come Tr
Dreams Come Tru
Dreams Come True

Bobby Brown
On Our Own

Don Henley
The End of the I
he End of the In
e End of the Inn
End of the Inno
End of the Innoc
nd of the Innoce
d of the Innocen
of the Innocenc
of the Innocence

9. Car Counter

Program Name: CarCounter.java

Input File: carcounter.dat

Example Input file

```
XOOXXXXXOOXXXXXOXOXXXXXOXOXXXXXXXOXOXXOOOXXXXXXXXXXXXX
OOXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
OXOXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
OXOXXOOOXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XXXOXOXOXXOOOXXXXXXOXOXXOOOXXXXXXXXXXOXOXXOOOXXXXXXXXXX
XOXOXOXXOOOXXXXXXOXOXXOOOXXOXXOOOXXXXXXOOXXXXXOOXXXXOXX
OXOXXOXOXXOXOXXOXOXXOXOXXOXOXXXXXXXOXOXXXXXXOXOXXXXXOXOX
XOOXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXOO
OOXXOXOXOXXOOXXOXOXXOOXXOXOXXOXOXXOXOXXOOOXXOXOXOXXOOXX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXOXOXXOOO
```

Output to screen:

```
15 small
14 medium
9 large
```

10. Forest Mapper

Program Name: ForestMapper.java

Input File: forestmapper.dat

Example Input file

15

[illegible]

Output to screen:

45

11. Grass Mapper

Program Name: GrassMapper.java

Input File: grassmapper.dat

Example Input file

```
15
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
RRRGRRRRRRRRRRRRRRRRRRRRGGGGRRRRRR
RRRGGGGGGGGGGGGGGGGGGGGGGGGRRRRRR
RRRRGGGRRRRRRRRRRGGGGGGGGGGRRRRRR
RRRRRGGRRRRRRRRRRRRRRRGGGGRRRRRR
RRRRGGRRRRRRRRRRRRRRRRGGGGRRRRRR
RRRRGRRRRRRRRRRRRRRRRRRGGRRRRRRRR
RRRGRRRRRRRRRRRRRRRRRRRRGGRRRRRR
RRRRRRRRRRGGGGRRRRRRRRRRRRGGRRRRRR
RRRRRRRRRRGGGGRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRGGGGRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRGGGGRRRRRRRRRRRRRRRRRRRR
RRRRRRRRRRGGRRRRRTTTRRRRRRRRRRRRR
RRRRRRRRRRRRRRRRRTTTTTRRRRRRRRRRR
RRRRRRRRRRRRRRRRRTTTTTTTTTTTRRRR
RRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRRR
```

Output to screen:

```
64
```

12. Way 2 Hard

Program Name: Way2Hard.java

Input File: way2hard.dat

Example Input file

```
599999 212
```

Output to screen:

```
1199998 424
```