

Intermediate Division
ACSL Poker

PROBLEM: A deck of playing cards has 52 cards. The cards are separated into 4 suits: diamonds, hearts, spades and clubs. Each suit has 13 cards that are labeled ace, 2–10, jack, queen and king. For this program diamonds will be numbered 1–13 to represent the cards ace through king, hearts will be numbered 14–26, spades will be numbered 27–39 and clubs will be numbered 40–52. In ACSL Poker you will be dealt 5 cards. Your task is to determine the best hand possible using those cards. The hands, in order of rank from low to high, to test for are:

A PAIR – Exactly 2 cards with the same label but of any suit - example: a 5 of hearts and a five of clubs. This would be cards - 18 and 44.

TWO PAIRS – 2 different pairs – example: a 5 of hearts and a 5 of clubs and an 8 of spades and an 8 of hearts. This would be cards - 18, 44, 34 and 21.

THREE OF A KIND – Exactly 3 cards with the same label but of any suit – example: a 5 of hearts, a 5 of clubs and a five of spades. This would be cards - 18, 44 and 31.

FLUSH – 5 cards of the same suit - example: 5, 6, 7, 8 and 10 of diamonds. This would be cards - 5, 6, 7, 8 and 10.

FULL HOUSE – A pair and three of a kind – example: a 5 of hearts, a 5 of clubs and a five of spades and an 8 of spades and an 8 of hearts. This would be cards - 18, 44, 31, 34 and 21.

FOUR OF A KIND – Exactly 4 cards with the same label – example: a 5 of hearts, a 5 of clubs, a 5 of spades and a 5 of diamonds. This would be cards - 18, 44, 31 and 5.

INPUT: There will be 5 lines of input. Each line will consist of 5 unique integers from 1 to 52 inclusive.

OUTPUT: For each line of input print the name of the highest hand possible. If no listed hand is possible, print NONE.

SAMPLE INPUT

1. 18, 44, 7, 21, 23
2. 18, 44, 31, 22, 38
3. 18, 44, 31, 34, 21
4. 18, 44, 31, 5, 9

SAMPLE OUTPUT

1. PAIR
2. THREE OF A KIND
3. FULL HOUSE
4. FOUR OF A KIND

Solutions for the above problem sets are on the ACSL web site www.acsl.org. There is also a complete set of questions from a previous year on the web site. The above includes a sample of a typical Contest #1 Programming problem for our Intermediate Division. The Senior Division program has the same subject matter but requires a little more programming skill. The Junior program again has the same subject matter but requires much less programming skill. The short answer question set above includes Intermediate Division questions from different contests. Five categories are shown, but a regular contest has just three different categories. The Senior and Junior Divisions include these topics with different degrees of difficulty. Students in all divisions have 72-hours to submit their programming problem solution to their teacher and would have 30-minutes to complete the 5 short answer questions. Teachers are provided test data and test solutions for grading the programming problem. One point is awarded for each answer that matches the test solutions. Teachers are also provided annotated solutions to the short answer questions. Again, one point is awarded for each answer matching the provided solutions. The Classroom Division problem set consists of 10 short answer questions from the same topic set. There is a 50-minute time limit. Upon registration teachers are sent a copy of the ACSL Category Book CD that gives the rules for each category and some additional sample questions and answers. Also on the web site is a page entitled "How ACSL Works" that gives detailed instructions for administering the contests. Contact ACSL at info@acsl.org.

1. Boolean Algebra (From Contest #2)

Simplify : $\overline{(A+B)}(\overline{A\overline{B}} + B\overline{C})$

2. Computer Number Systems (From Contest #1)

What is the 10th term expressed in octal of the following sequence:
1₈ , 100₂ , 11₈ , 10₁₆ ...

3. LISP (From Contest #1)

Evaluate: (EXP (DIV (MULT (ADD 2 (SUB 4 2)) 3) 2) 4)

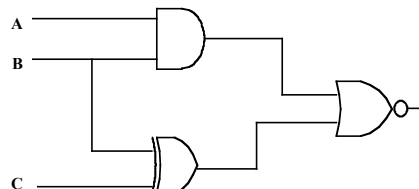
4. Recursive Functions (From Contest #1)

Find f (12)

$$f(x) = \begin{cases} f(x-2) + x & \text{if } x \text{ is a multiple of } 3 \\ f(x-3) - x & \text{if } x \text{ is a multiple of } 5 \\ 2x + 5 & \text{otherwise} \end{cases}$$

5. Digital Electronics (From Contest #3)

List the ordered triples that make the following circuit TRUE?



All fees are in US dollars. Payment or a purchase order must accompany all orders. Register between September 1 and December 1, 2008. Contact ACSL at info@acsl.org.

School _____

School Address: Street _____

City _____ State/Province _____

Zip/Postal Code/Country _____

School Phone: Area Code ____ Tel. _____

Home Phone: Area Code ____ Tel. _____

Advisor: _____

Registration: See the "DIVISIONS" section for more information.

Classroom 5

Junior 5

Novice/3

Intermediate/5 or Intermediate/3

US Senior/5 or International Senior/5 or Senior/3

Cost: 1 team per division
1 team \$125
2 teams \$225
3 teams \$300
4 teams \$350

Previous Years' Contest Books:

Sr., Int. and Jr. 2007 - 2008 (\$20) on CD – VOL 30

Sr., Int. and Jr. 2006 - 2007 (\$20) on CD – VOL 29

Sr., Int. and Jr. 2005 - 2006 (\$20) on CD – VOL 28

Sr., Int. and Jr. 2004 - 2005 (\$20) on CD – VOL 27

Sr., Int. and Jr. 2003 - 2004 (\$20) on CD – VOL 26

Sr., Int. and Jr. 2002 - 2003 (\$20) on CD – VOL 25

Sr., Int. and Jr. 2001 - 2002 (\$20) on CD – VOL 24

TOTAL PAYMENT DUE: _____

American Computer Science League

The American Computer Science League (ACSL) is a non-profit organization devoted to computer science education at the secondary school level. ACSL is on the approved activities list of the NASSP. The purpose of this flier is to tell you about the organization, and to invite your school to participate in it.

ACSL administers computer science contests for junior and senior high school students, publishes a newsletter containing the results of each contest and items of interest, and awards prizes (computer equipment, books, and trophies) to outstanding students and schools at local and regional levels. This past year, our 30th year of operation, about 225 schools in the United States and Canada participated. In addition, ten teams from Europe and Asia participated in ACSL last year.

ACSL will provide a unique and exciting educational opportunity for your school's computer enthusiasts. Contest problems motivate students to study computer topics not covered in their school's curriculum and to pursue classroom topics in depth. At many schools, the League is the focal point both for extracurricular clubs and for entire courses.

The competition consists of 4 contests. Each is held at the participating school thereby eliminating the need for travel, and an unlimited number of students from all grade levels may compete at each school. A school's score is the sum of the scores of its three or five highest-scoring students. In each contest, students are given short theoretical and applied questions, and then a programming problem to solve within the following three days. Programming is done on any school or home computer using any language allowed by the advisor. A faculty advisor administers the contest at each school and results are returned to ACSL for tabulation. At the end of the year, an Invitational Team All-Star Contest, based upon cumulative scores, is held at a common site.

SPONSORS

The following companies were very generous in providing prizes at the ACSL All-Star Contest at Marriotts Ridge HS, Marriottsville, MD:

Addison Wesley Publishing
O'Reilly Publishing
Photomosaics
Thompson Course Technology
New Riders
Peachpit Publishers
Electronic Arts

ACSL DIVISIONS

The American Computer Science League consists of multiple divisions to appeal to the varying computing abilities and interests of students.

One registration fee allows **all** students at a school to compete in any one division. The advisor reports the sum of the highest-scoring students as the team score. We encourage schools to join more than one division so that the material does not intimidate novice students, nor are advanced students bored. All divisions cover similar material, but in varying levels of detail and difficulty.

The US Senior Division and the Intermediate Division allow either 3-person or 5-person teams, at the school's choice. The International Senior, Junior, and Classroom divisions are 5-person teams; the Novice division is for 3-person teams only. Teams compete for prizes and invitations to the All-Star Contest against same-sized teams; students will compete for individual awards independent of the team size. A school may not register both a 5-person team and a 3-person team in the same division.

- The **US Senior Division (3-person or 5-person)** is geared to those US high school students with experience programming computers, especially those taking a Computer Science AP course.
- The **International Senior Division (5-person)** is for all high school teams located outside the United States.
- The **Intermediate Division (3-person or 5-person)** is geared to US senior high school students with little or no computer programming experience, and to advanced junior high students.
- The **Novice Division (3-person)** is for all first-year schools that would like to try it out as an Intermediate 3-person team. Teams only compete with other novice division teams for awards.
- The **Junior Division (5-person)** is geared to all junior high and middle school students with no previous experience programming computers. Students must be in Grade 9 or below, and must be 14 years or younger at each contest
- The **Classroom Division (5-person)** is open to students from all grades. It consists of a selection of the non-programming problems from the other three divisions. As its name implies, this division is particularly well suited for use in the classroom.



ACSL has been approved for listing on the National Association of Secondary School Principals Advisory List of Student Contests and Activities.

CONTEST DATES

The following are the contest end dates for the contest year:

Contest #1	Friday, December 19, 2008
Contest #2	Friday, February 13, 2009
Contest #3	Friday, March 13, 2009
Contest #4	Friday, April 10, 2009

The ACSL Invitational Team All-Star contest will be held on Saturday, May 23, 2009 at Bob Jones HS, Huntsville, AL.