Intermediate
Division ACSLPoker

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 I -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: as 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.

1BREE 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: as 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 I 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	SAMPLE OUTPUT
1. 18,44,7,21,23	1. PAIR
2. 18,44,31,22,38	2. THREE OF A KIND
3. 18,44,31,34,21	3. FULL HOUSE
4. 18,44,31,5,9	4. FOUR OF A KIND

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1. Boolean Algebra

   Simplify: $(A+B)(AB+BC)$

2. Computer Number Systems (From Contest #1)

   What is the 10th term expressed in octal of the following sequence:
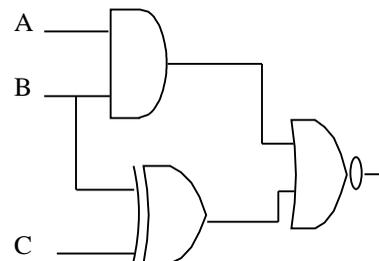   Is , 100_2, lis, 10_{16} ...

3. LISP

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

4. Recursive Functions   Find f (12)

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

5. Digital Electronics
List all the ordeed triples
that make the circuit TRUE.

Solutions for the above problem sets are on the ACSL web site http://www.acsl.org/acsl/16-17/fliersoln.pdf. 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.

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 38th year of operation, about 225 schools in the United States and Canada participated. In addition, teams from Europe, Africa 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 Nahua HS South, NH:

- Adobe
- Google
- No Starch Press
- O'Reilly Media
- Pearson
- Pragmatic Bookshelf
- Wolfram

ACSL DIVISIONS

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

One registration fee allows **all** students at a school to compete. The advisor reports the sum of the 3 or 5 best scores 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 Senior and Intermediate divisions allow 5-person and 3-person teams. Teams compete for prizes and invitations to the All-Star Contest against same-sized teams; students 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 **Senior Division** is geared to those high school students with experience programming computers, especially those taking a Computer Science AP course. We suggest that schools do not register for the Senior Division during their first year of ACSL participation.

- The **Intermediate Division** is geared to senior high school students with little or no computer programming experience, and to advanced junior high students.

- The **Junior Division** is geared to junior high and middle school students with no previous experience programming computers. No student beyond grade 9 may compete in the Junior Division.

- The **Classroom Division** 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.

- The **Elementary Division** is open to students from grades 3 - 6. It consists of a selection of the non-programming problems from 4 of our categories. One category is tested each contest. This division is particularly well suited for introduction of computer science in the classroom or as a club activity.

ACSL

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CONTEST DATES

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

Contest #1	Friday, December 23, 2016
Contest #2	Friday, February 10, 2017
Contest #3	Friday, March 10, 2017
Contest #4	Friday, April 14, 2017

The ACSL Invitational Team All-Star contest will be held on Saturday, May 27, 2017.