2019-2020

AMERICAN COMPUTER SCIENCE LEAGUE

Contest #4

Intermediate Division - Patolli

PROBLEM: Given the grid below for the game of ACSL Patolli, utilize the following rules to play the game. All rules must be applied in the sequential order listed.

1. There are 2 players. Each player has 3 markers.
2. The markers move according to the roll of a die (1 – 6).
3. Markers move in numerical order around the grid.
4. If, on a die roll, a marker lands on an occupied location, then that marker loses its turn and remains at its previous location.
5. A marker can jump over another marker on its way to finish its move.
6. A marker finishes its way around the grid when it lands on location 52. It is then removed from the board. A move can't take a marker beyond location 52. If it does, the marker remains at its previous location.
7. If, on a die roll, a marker lands on an unoccupied location that is a prime number, the marker then moves six locations forward. However, it stops immediately before any occupied location.
8. If, on a die roll, a marker lands on an unoccupied location that is a perfect square greater than 4, the marker then moves 6 locations backwards. However, it stops immediately before any occupied location.
9. If, on a die roll, a marker lands on an unoccupied location that is neither a prime number nor a perfect square, then determine if the marker made at least one horizontal move followed by at least one vertical move (such as going from 6 to 8, 11 to 13, 26 to 28 … but not 2 to 4 or 30 to 32). In that case, the marker can only land on a location on its path that is a multiple of the die roll value even if it moves a smaller distance than the die roll value. However, if all the locations in its path that are multiples are occupied, then the marker does not move from its current location. The rules listed in #7 and #8 do not apply when using #9.

				1	**52**				
				2	**51**				
7	**6**	**5**	**4**	**3**	**50**	**49**	**48**	**47**	**46**
8	**9**	**10**	**11**	**12**	**41**	**42**	**43**	**44**	**45**
17	**16**	**15**	**14**	**13**	**40**	**39**	**38**	**37**	**36**
18	**19**	**20**	**21**	**22**	**31**	**32**	**33**	**34**	**35**
				23	**30**				
				24	**29**				
				25	**28**				
				26	**27**				

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For this program all of the marker moves will be by the player's marker at the lowest numbered location.

Using Sample #1, the 3 opponent's markers are at Locations #4, 14 and 24. The player's markers are at Locations #1, 8 and 12. There will be 6 die rolls. The first die roll is a 6. Being the lowest numbered marker, the marker at Location #1 moves to Location #7. 7 is a prime number. The marker should move 6 locations forward but is blocked at Location #8. It stays at Location #7. The next roll is a 3. The marker at Location #7 stops at Location #10. The lowest numbered player marker is at Location #8. The next die roll is a 5. The marker moves to Location #13. 13 is prime, so the marker should move 6 locations forward, but is blocked at 14. It stays at Location #13. The next die roll is a 1. The lowest player marker is at Location #10. The marker moves to
Location #11. 11 is a prime number so it tries to move forward 6 spaces, but is blocked by the player's marker at Location #12 so it stays at location #11. The lowest numbered player marker is a Location #11. The next die roll is a 5. It moves to Location #16 which is a perfect square so it tries to move 6 spaces backward, but is blocked at location #14 so it stops at Location #15. The last die roll is a 6 so it tries to move the marker at Location #12 to Location #18, but the move goes from at least 1 horizontal move (16 to 17) to at least 1 vertical move (17 to 18) so the marker must land on a multiple of 6. It stops at location #18.

INPUT: There will be 5 lines of input. Each line will contain the 3 values giving the locations of the opponent's markers on the board. That will be followed by the location of the 3 player's markers. That will be followed by an integer, r, giving the number of die rolls followed by the value of those die rolls.

OUTPUT: For each line of input, print the location numbers of the player's markers on the grid in numerical order. If there are no player's markers on the grid, print GAME OVER.

SAMPLE INPUT: http://www.datafiles.acsl.org/2020/contest4/int-sample-input.txt

4 14 24 1 8 12 6 6 3 5 1 5 6
14 28 31 10 20 24 7 6 6 5 5 6 2 4
5 30 33 3 20 24 8 6 6 6 5 6 3 4 6
4 11 15 2 8 20 5 5 2 5 1 6
45 50 48 42 46 40 6 3 2 6 5 4 1

SAMPLE OUTPUT:

1. 13 15 18
2. 26 29 30
3. 20 23 24
4. 14 16 20
5. 44 46 47

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TEST DATA

TEST INPUT:

37 41 47 35 43 48 6 5 5 6 5 4 2
13 29 39 15 21 31 10 4 5 2 4 6 6 5 5 6 5
43 47 40 28 30 32 10 5 3 2 6 1 5 2 6 3 2
1 5 10 2 12 8 12 5 5 4 4 3 3 2 2 1 1 6 6
20 25 15 30 18 24 16 6 6 4 5 2 1 6 4 2 3 6 5 4 5 3 1

TEST OUTPUT:

1. 49 50
2. 34 35 36
3. 37 38 39
4. 9 11 12
5. 32 33 35