

Quiz 6 Solutions

Wed 4 Dec

1. The three tables below represent Artists, Museums, and Paintings. The Painting table contains foreign keys to the other tables, as indicated by the column header. All questions pertain *only* to the data provided here.

Artist:

ID*	Last	First	Born	Died	Country
1	Church	Frederic	1826/05/04	1900/04/07	US
2	Degas	Edgar	1834/07/19	1917/09/27	FR
3	van Gogh	Vincent	1853/03/30	1890/07/29	NL
4	Mondrian	Piet	1872/03/07	1944/02/01	NL
5	Monet	Claude	1840/11/14	1926/12/05	FR

Museum:

ID*	Name	City	State	Country
1	Getty Center	Los Angeles	CA	US
2	Metropolitan Museum of Art	New York	NY	US
3	Museum of Modern Art	New York	NY	US
4	Musée d'Orsay	Paris	null	FR
5	Yale Art Gallery	New Haven	CT	US

Painting:

ID*	Year	Title	Artist↑	Museum↑
1	1859	The Heart of the Andes	1	2
2	1867	View of Cotopaxi	1	5
3	1873	L'absinthe	2	4
4	1877	Ballet Dancers Rehearsing	2	1
5	1888	Starry Night over the Rhone	3	4
6	1891	Wheatstacks	5	1
7	1919	Water Lilies	5	2
8	1929	Fox-Trot B	4	5
9	1943	Broadway Boogie Woogie	4	3

- (a) Were all of the listed artists ever alive at the same time?
 Yes. You can tell because the maximum birth year (1872) is less than the minimum death year (1890).
- (b) What paintings can I see at the Yale Art Gallery?
 Yale is museum 5, which includes the paintings *View of Cotopaxi* and *Fox-Trot B*.
- (c) In which cities can I see the work of Degas?
 Degas is artist 2, which corresponds to paintings 3 and 4 at museums 4 and 1. So the cities are Paris and Los Angeles.

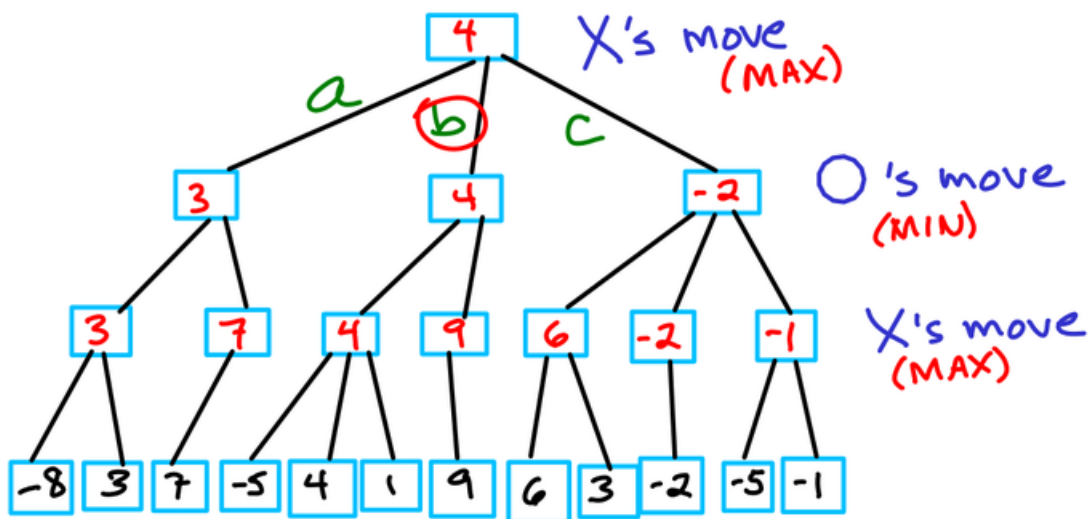
(d) In this database, what is the oldest painting that you can see in New York?

New York includes museums 2 and 3, which display paintings 1, 7, and 9. The oldest of these is *The Heart of the Andes*.

(e) Which artists have paintings on display in their home country?

The only museums listed here are in the US and France, so we eliminate van Gogh and Mondrian. **Church** is displayed at the Met. L'absinthe by **Degas** is displayed in Paris (his home country). Monet is displayed only at the Getty, not his home country.

2. Below is a game tree in which player X is deciding which move to make: a, b, or c. The scores across the bottom are the relative value of that game state for player X. Use the *minimax* algorithm to propagate the scores and **determine the best move** for player X.



3. Briefly, why do we need to apply a *heuristic* to a game tree such as the one in the previous question?

There is not enough time or memory to expand the tree all the way to a win or loss, so the heuristic *estimates* the value of a board that a few moves into the future.