

Checkerboard Universe Activity—Lab Partner’s Handout

Instructions

Your job is to read the rule of the universe **SILENTLY** and understand what it means. Then, indicate that the other player may begin placing checkers. For each checker played, say “That is allowed,” or, say “That is not allowed,” depending on whether the placement and color of the checker fits the rule or not.

When the other player thinks that she knows the rule, then she will tell you the rule. Make sure that her statement of the rule is exactly the same or completely equivalent. For example, if she says “red checkers” when the rule actually applies to checkers of any color, then her statement is not correct. In this case, do not give hints, but merely say, “That is not exactly correct. You should do more experiments.”

If the other player gets too frustrated (such as spending 20 minutes on one universe), then you may give a slight hint. For most people, the tendency is to give too many hints. Let the other player struggle a little bit and maybe get a little bit frustrated before you give any hints. Learning to think outside the box is a very important lesson, and the lesson will not be learned if you give away the answer too quickly.

1. Universe

Rule: *Black checkers are only allowed on red squares and red checkers are only allowed on black squares.*

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

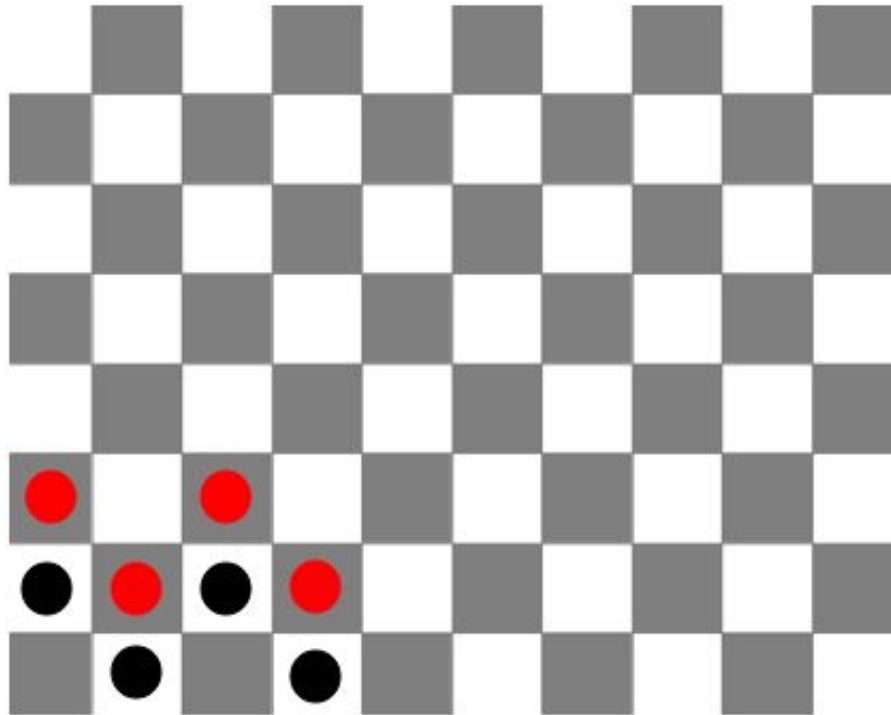


Figure 1:

2. Universe

Rule: *Checkers (of any color) are allowed anywhere on a row but only on every other row.*

(Note: you should allow the first checker. Then, checkers are allowed on that row and every other row.)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

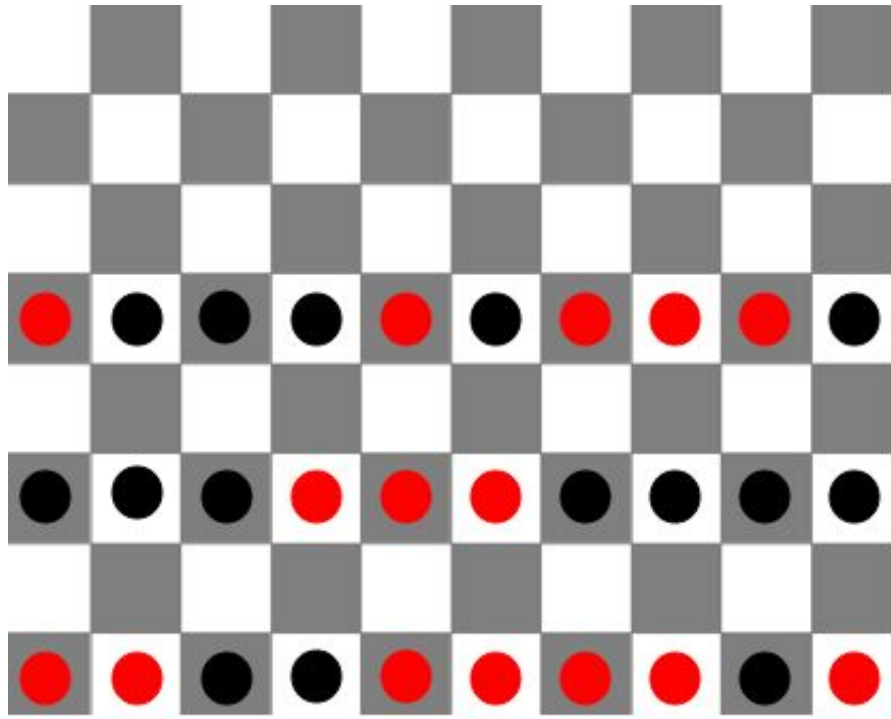


Figure 2:

3. Universe

Rule: *Checkers (of any color) are allowed only on the four corner squares and the middle four squares on the board.*

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

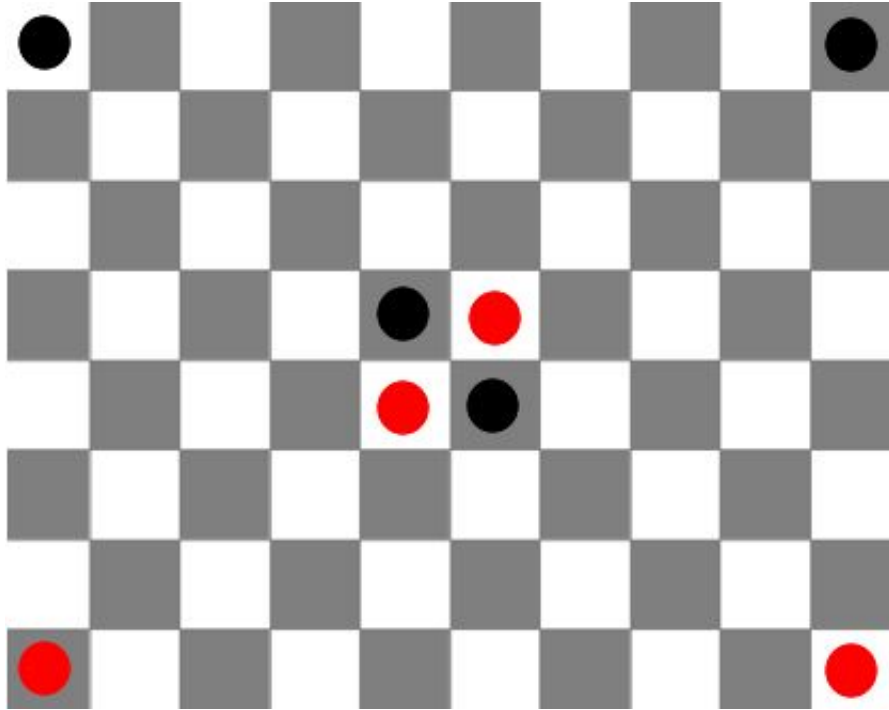


Figure 3:

4. Universe

Rule: *Checkers (of any color) are only allowed on the intersections of the lines.*

(Note that intersections are defined to be the locations where the lines cross. This is usually a tough one. DO NOT GIVE HINTS!)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

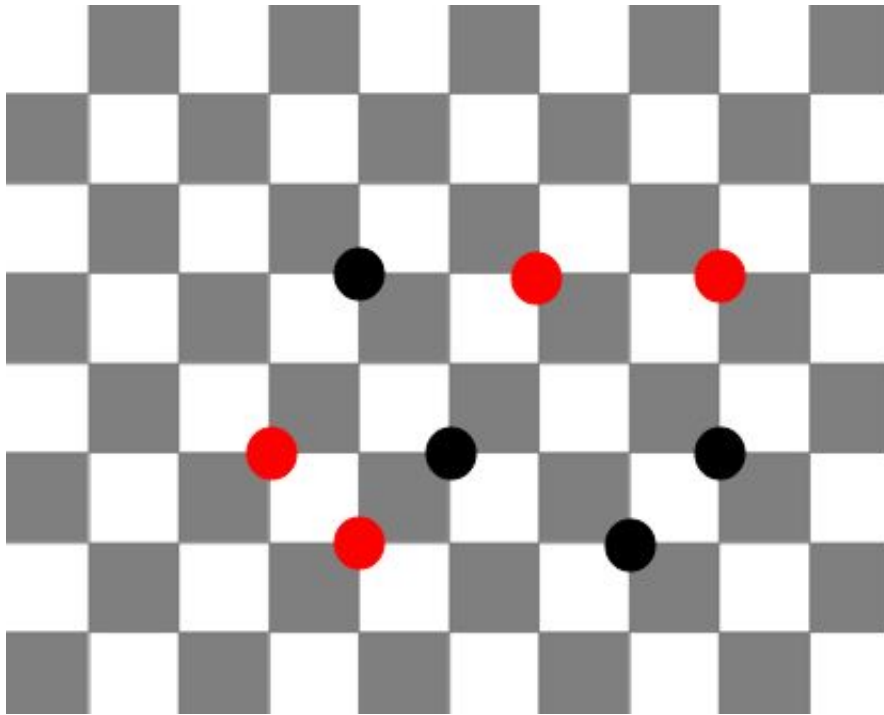


Figure 4:

5. Universe

Rule: *Checkers (of any color) are only allowed on top of the lines that make up the squares.*

(Note that no checkers are allowed on the squares or on the intersections of the lines.)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

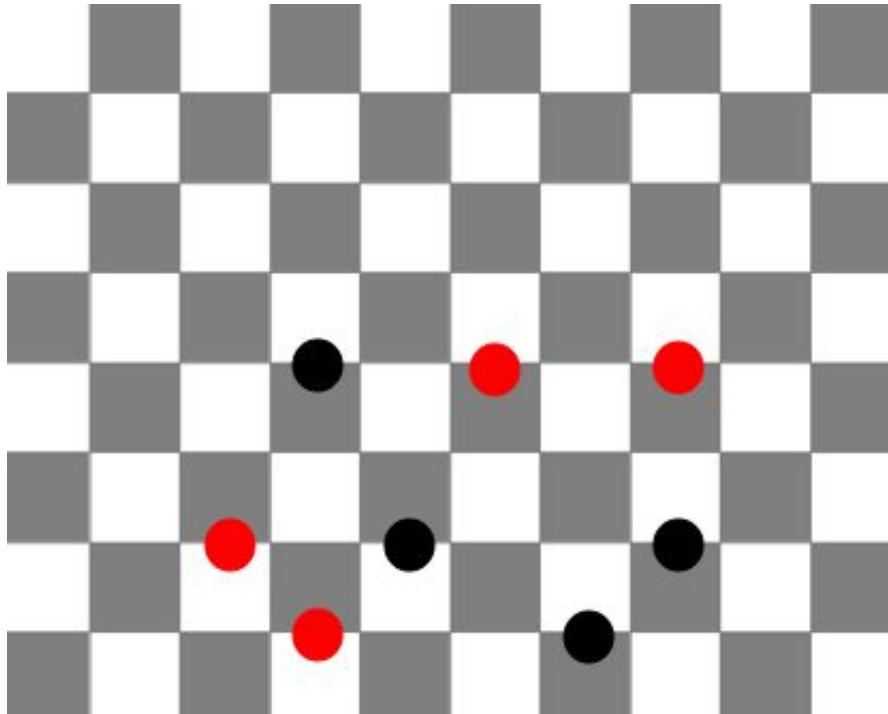


Figure 5:

6. Universe

Rule: *All checkers must be placed next to the previous checker played.*

(Let the first checker be placed anywhere. Then, the next checker must be placed next to (but not diagonally to) this checker. Subsequent checkers must also be placed next to (but not diagonally to) the previous checker played.)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

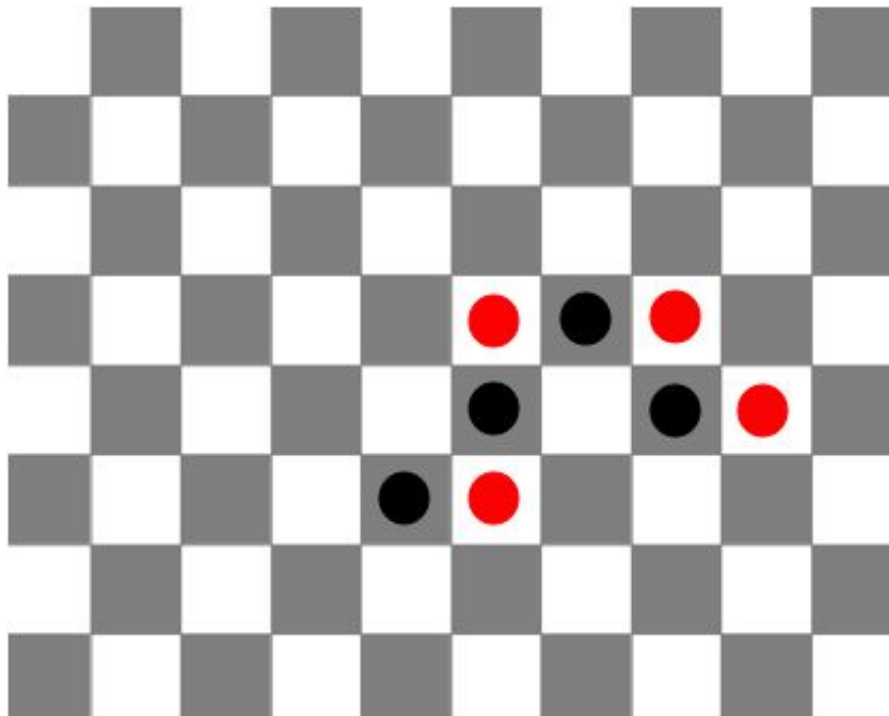


Figure 6:

7. Universe

Rule: *No checker may be placed next to another checker.*

(Let the first checker be placed anywhere. Then, the next checker must be placed diagonal to or at least one square away from the first checker played. Each subsequent checker must also be diagonal to or at least one square away from any other checker.)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

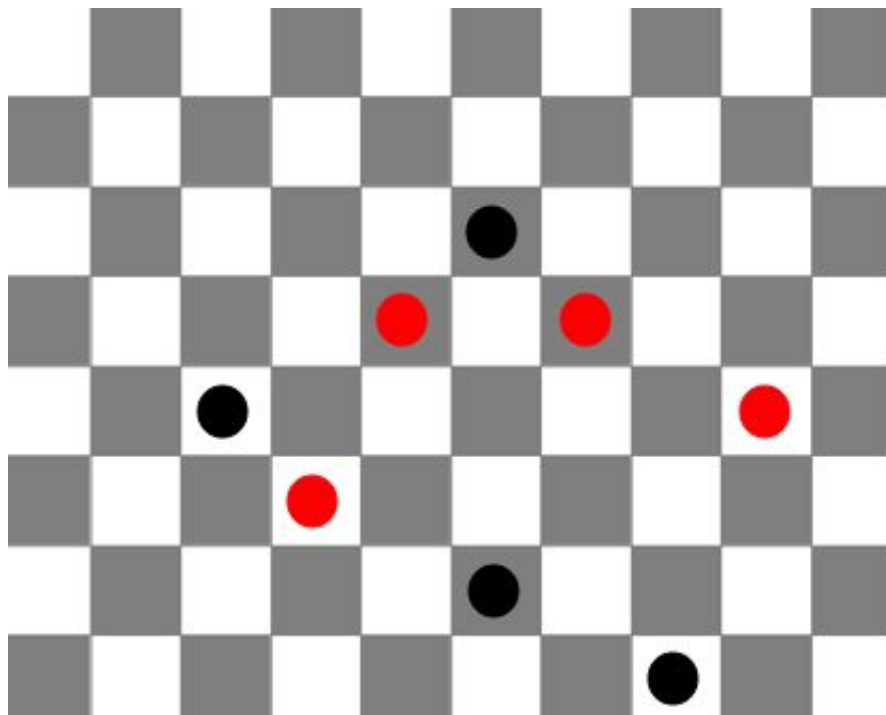


Figure 7:

8. Universe

Rule: *Black checkers (only!) are only allowed in stacks of two on any square.*

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

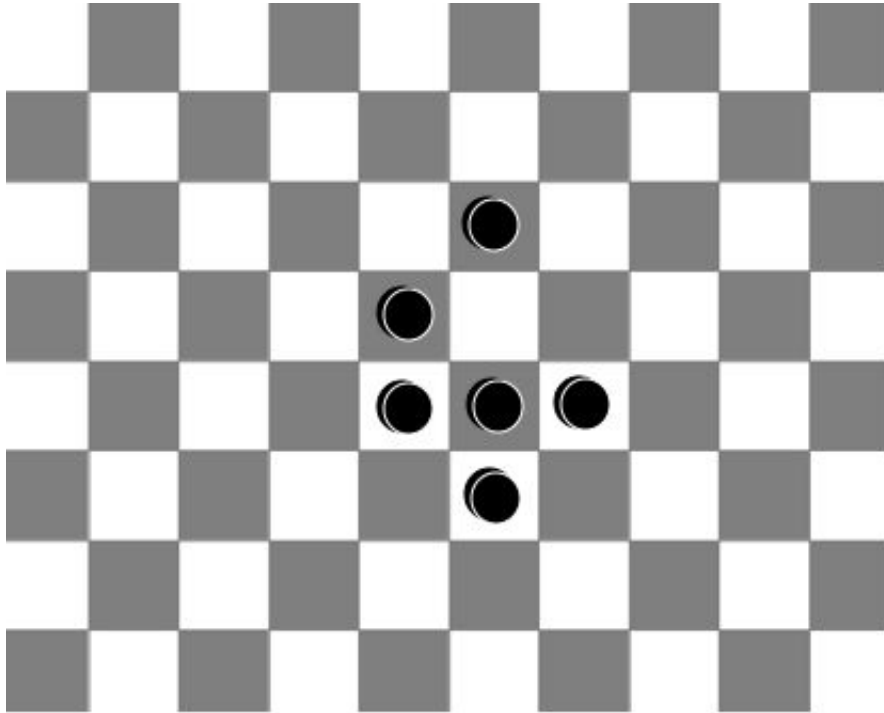


Figure 8:

9. Universe

Rule: *Stacks of one red and one black (in any order) are allowed only on red squares.*

(This is usually a tough one.)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

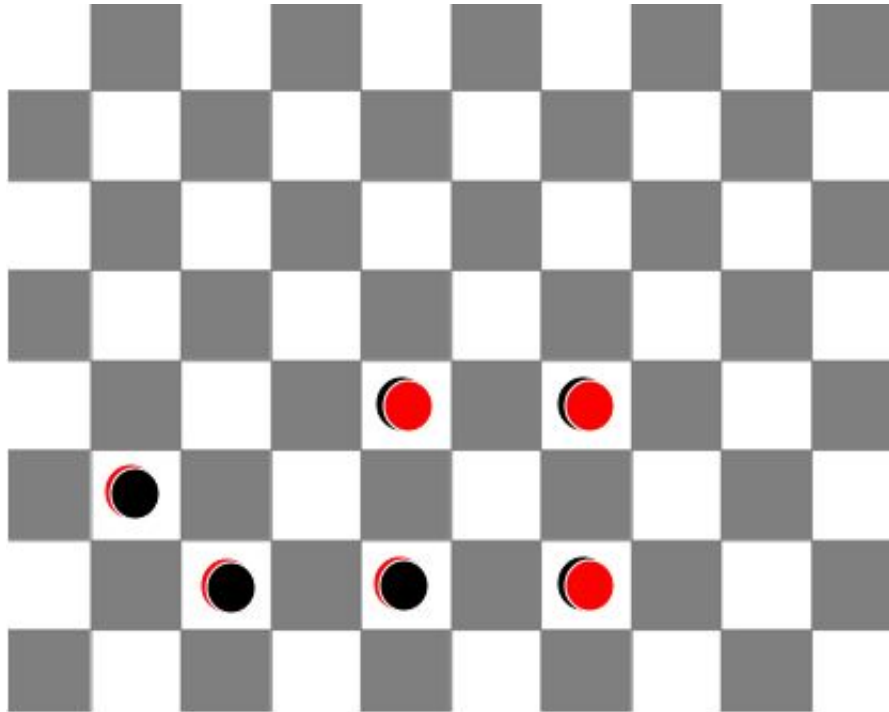


Figure 9:

10. Universe

Rule: *Checkers are only allowed on one side (i.e. half) of the board.*

(Note: Let the first checker be played. Then, all subsequent checkers must be played on the same half of the board. Use the "fold" in the board to delineate the two sides of the board.)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

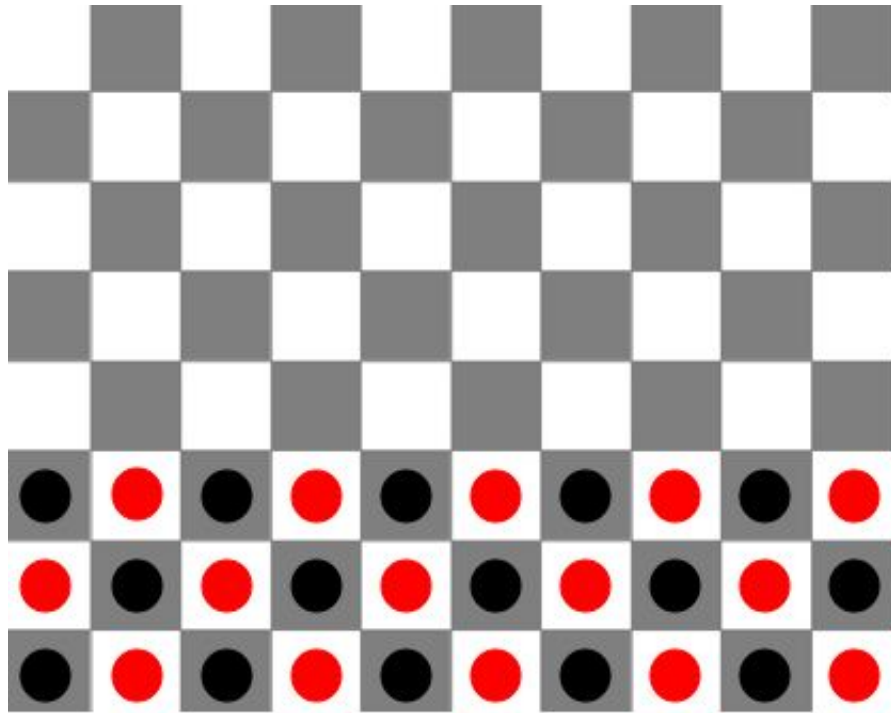


Figure 10:

11. Universe

Rule: *Red checkers are only allowed on one side of the board; black checkers are only allowed on the other side of the board.*

(Note: Let the first checker be played. Then, checkers of the same color must be played on the same side of the board. Checkers of the opposite color must be played on the opposite side of the board.)

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

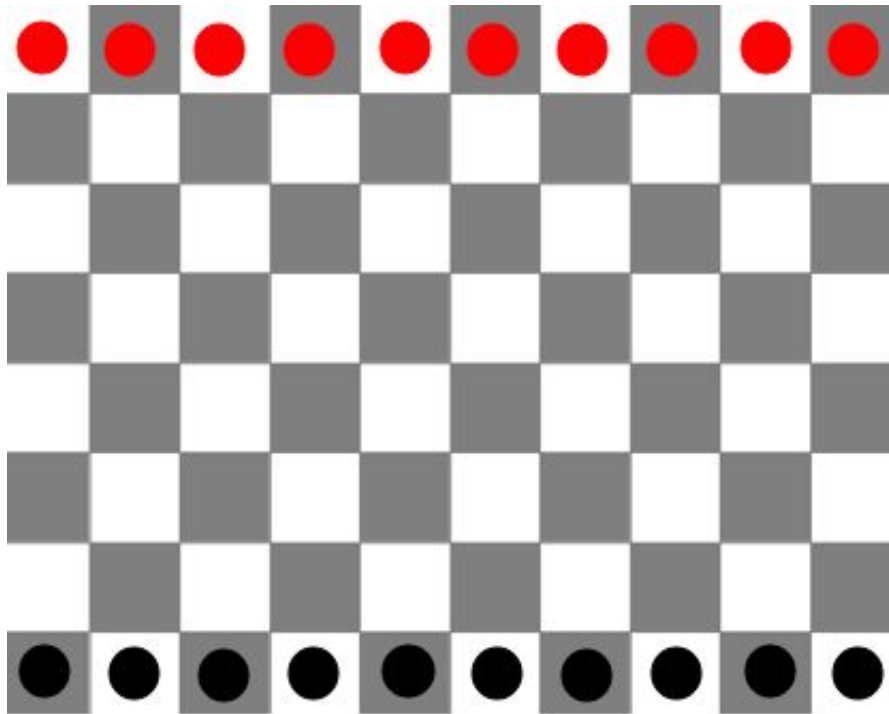


Figure 11:

12. Universe

Rule: *No checkers may be placed anywhere on the board.*

For example, the checkers in the following picture are allowed. Note that there are many possible combinations of checkers that would be allowed. This example is not the only possibility.

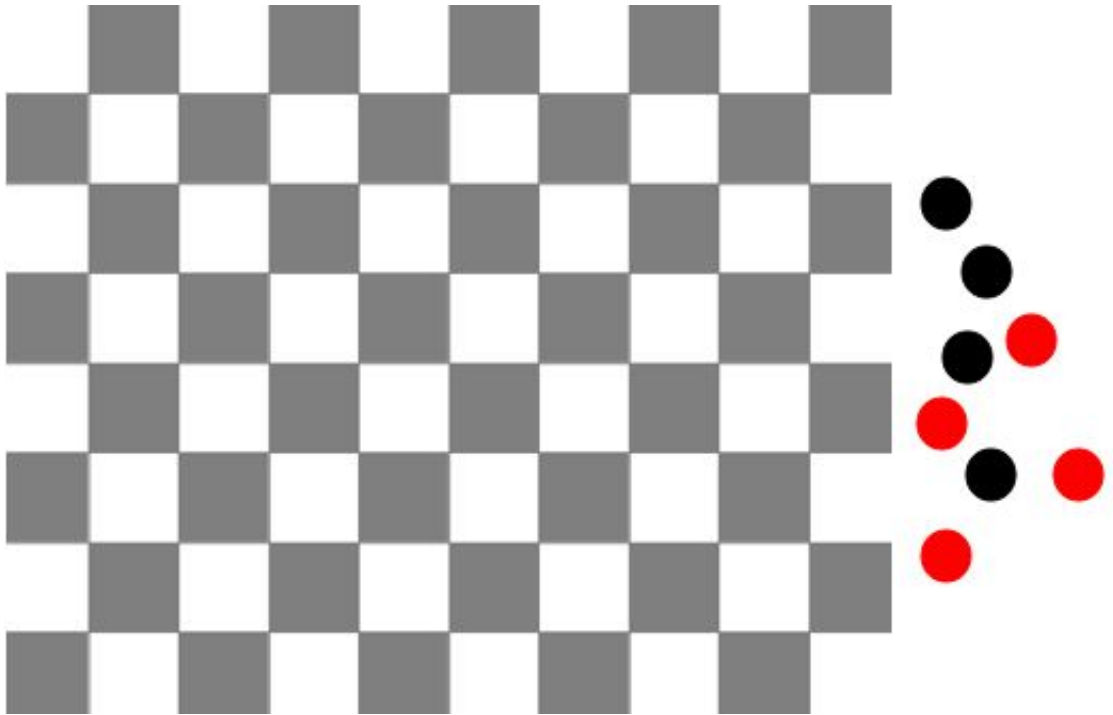


Figure 12: