Coin Shuttles

Moving Pairs 1

Take two pennies , two dimes and two nickels and arrange them in a row, alternating nickel, dime and penny to get N D P N D P . The goal is to move the coins in pairs so that the coins are again in a row the coins paired up in N N D D P   P positions.

Each move consists in placing your index and middle finger on any 2 ADJACENT COINS, and sliding those two coins to a new position (without rotating). This can be done in three moves.

to

Start by placing the coins in the space below so they are lined up **N D P N D P**

Remember to record your movements so you can reproduce the solution.

Moving Pairs 1 solution.

Move 1 : Take the 2 coins with dots on them and slide them to the right end of the row

to get

Move 2 : Take the 2 coins with dots on them and slide them to the left so the nickels are next to each other.

to get

Move 3 : Take the 2 coins with dots on them and slide them to the left so the dimes are next to each other.

to get

Moving Pairs 2

Take three pennies and three nickels and arrange them in a row, alternating penny and nickel to get P N P N P N .   The goal is to move the coins in pairs so that the coins are again in a row the coins paired up in N N N P P P positions.

Each move consists in placing your index and middle finger on any 2 ADJACENT COINS, and sliding those two coins to a new position (without rotating!). This can be done in three moves.

to

Start by placing the coins in the space below so they are lined up **P N P N P N**

Remember to record your movements so you can reproduce the solution.

Moving Pairs 2 Solution

Move 1 : Take the 2 coins with dots on them and slide them to the right end of the row

to get

Move 2 : Take the 2 coins with dots on them and slide them to the open space in the middle of the row.

to get

Move 3 : Take the 2 coins with dots on them and slide them to the right end of the row

to get

Moving Pairs 3

Take three nickels and two pennies and arrange them in a row, alternating penny and nickel to get   N P N P N .   The goal is to move the coins in pairs so that the coins are again in a row the coins paired up in N N N P P positions.

Each move consists in placing your index and middle finger on any 2 ADJACENT COINS, and sliding those two coins to a new position (without rotating!). This can be done in four moves.

to

Start by placing the coins in the space below so they are lined up **N P N P N**

Remember to record your movements so you can reproduce the solution.

Moving Pairs 3 Solution

Move 1 : Take the 2 coins with dots on them and slide them to the right end of the row LEAVING a gap that is at least 2 coins wide.

to get

Move 2 : Take the 2 coins with dots on them and slide them to the right end of the row.

to get

Move 3 : Take the 2 coins with dots on them and slide them to the left to fill the gap.

to get

Move 4 : Take the 2 coins with dots on them and slide them to the right to fill the gap.

to get

Moving Pairs 4

Take 2 nickels heads facing up and 2 nickels facing tails up and arrange them as shown in the figure to the left below. The goal is to move the coins in pairs so that the coins are arraigned as shown in the figure to the right below.

Each move consists in placing your index and middle finger on any 2 ADJACENT COINS, and sliding those two coins to a new position (without rotating!). This can be done in four moves.
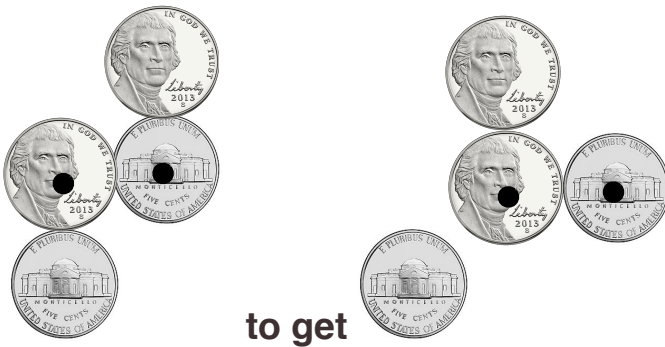

To Get --->

Moving Pairs 4 solution

Move 1 : Take the 2 coins with dots on them and slide them down one space

to get

Move 2 : Take the 2 coins with dots on them and slide them right one space
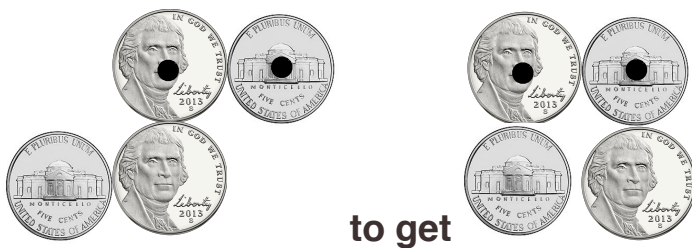
to get

Move 3 : Take the 2 coins with dots on them and slide them down in space

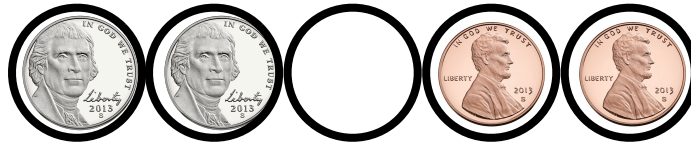**Move 4 :** Take the 2 coins with dots on them and slide them down in space

to get

Changing Places 1

Place 2 nickels and 2 pennies in the open circles as shown below
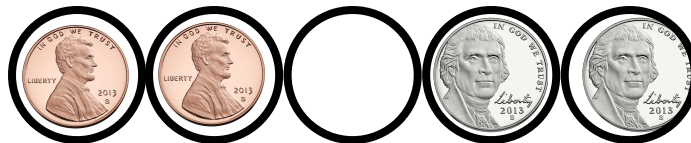

The object of the puzzle is to move the coins so that the pennies end up on the left and the nickels end up on the right.
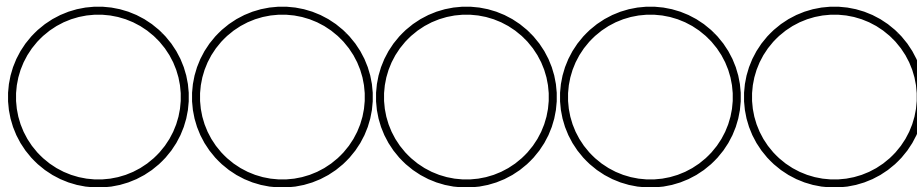
Rules for moving the coins:

•Nickels move only to the right. Pennies move only to the left.

•A coin can move forward to an adjacent open square.

•A coin can jump over **one coin of the other type into an open square.**

•N0 other types of moves are permitted.

to get this

Remember to record your movements so you can reproduce the solution.

Changing Places 1 Solution

Move the n to the left

P P ◯ N N to get P P N ◯ N

Jump the p right over the n

P P N ◯ N to get P ◯ N P N

Move the p to the left

P ◯ N P N to get ◯ P N P N N

Jump the n left over the p

◯ P N P N to get N P ◯ P N

Jump the n left over the p

N P ◯ P N to get N P N P ◯

Move the p to the left

N P N P ◯ to get N P N ◯ P

Jump the p right over the n

N P N ◯ P to get N ◯ N P P

Move the n to the left

N ◯ N P P to get N N ◯ P P
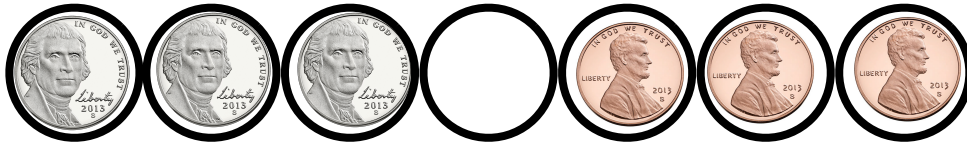
Changing Places 2

## Place 3 nickels and 3 pennies in the open circles as shown below

The object of the puzzle is to move the coins so that
## the pennies end up on the left and the nickels end up on the right.

Rules for moving the coins:

• Nickels move only to the right. Pennies move only to the left.

• A coin can move forward to an adjacent open square.

• A coin can jump over **one coin of the other type into an open square.**

• N0 other types of moves are permitted.

to get this
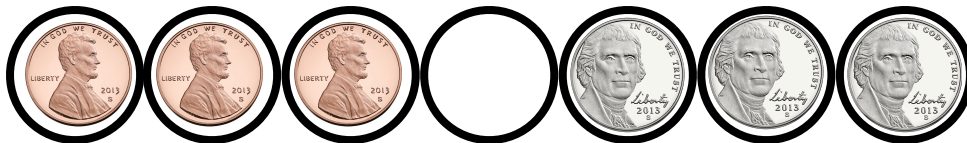
Remember to record your movements so you can reproduce the solution.
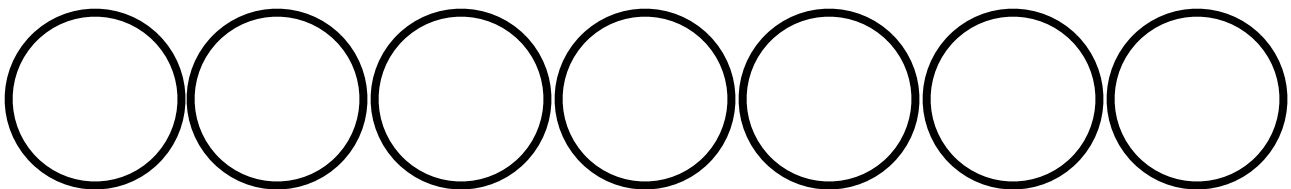
Changing Places 2 Solution

Move the n to the left

P P P ( ) N N N   to get   P P P N ( ) N N

Jump the p right over the n

P P P N ( ) N N   to get   P P ( ) N P N N

Move the p to the left

P P ( ) N P N N   to get   P ( ) P N P N N

Jump the n left over the p

P ( ) P N P N N   to get   P N P ( ) P N N

Jump the n left over the p

P N P ( ) P N N   to get   P N P N P ( ) N

Move the n to the right

P N P N P ( ) N   to get   P N P N P N ( )

Move the p to the left

P N P N P N ( )   to get   P N P N ( ) N P

Move the n to the left

P N P N ( ) N P   to get   P N P N ( ) N P

Jump the p right over the n

P N P N ( ) N P   to get   P N ( ) N P N P

Jump the p right over the n

P N ( ) N P N P   to get   ( ) N P N P N P

Move the n to the left

( ) (**N**) (P) (N) (P) (N) (P) **to get** (N) ( ) (P) (N) (P) (N) (P)

Jump the n left over the p

(N) ( ) (P) (**N**) (P) (N) (P) **to get** (N) (N) (P) ( ) (P) (N) (P)

Jump the n left over the p

(N) (N) (P) ( ) (P) (**N**) (P) **to get** (N) (N) (P) (N) (P) ( ) (P)

Move the p to the right

(N) (N) (P) (N) (**P**) ( ) (P) **to get** (N) (N) (P) (N) ( ) (P) (P)

Jump the p right over the n

(N) (N) (**P**) (N) ( ) (P) (P) **to get** (N) (N) ( ) (N) (P) (P) (P)

Move the n to the left

(N) (N) ( ) (**N**) (P) (P) (P) **to get** (N) (N) (N) ( ) (P) (P) (P)

Most puzzle start with the same number of coins on the right and left with 1 space between the two types of coins. Others have more of one coin than the other. Which side one type of coin starts on does not effect the solution.

Lets say we start with p pennies and n nickels. Each jump switches places between a penny and a nickel. However the coins are placed next to each other a jump switches the order of the coins and moves the open space. To reach the final solution, each of the P pennies must change positions with each of the N nickels. Therefore, there is a total of MN jumps.

Each of the P pennies must move P + 1 positions to the right. Each of the N nickels must move N + 1 positions to the left. The total number of positions to move over is thus given by P(N + 1) + N(P + 1).

<div align="center">

The number of moves needed to solve the problem
is N(P + 1) + P(N + 1) − PN = PN + P + N
You will need P(N) jumps and P + N slides.

</div>

At every stage of solution, when it comes to selecting the next move, you may have to select either between two jumps, or two slides or a jump and a slide. One approach to solving the puzzle is to develop a certain strategy of behavior in each of the three cases.

The bottom line is that the correct moves are actually forced.   At every given moment (excluding the starting configuration) there is only one correct move.

1. 2 jumps in a row are never correct. Whichever jump you choose, you are stuck on the second jump unless the open space ends up at the end square. In which case you get stuck on the second move.

2. If the choice is between Jump or Slide choose a jump for you'll stuck after a slide.

3. When it's a question of selecting between two slides, see that the configuration you are getting is not the fatal Jump/Jump.

There is another interesting fact. For every sequence of moves, we can form a string of letters S and J. S denotes a **S**lide, while J stands for a **J**ump. Because of the symmetry, there is no wonder that, when P = N, the two strings corresponding to the two solutions are identical. What's interesting is that the same is true even when P differs from N. In addition, the string of moves is alway palindromic.
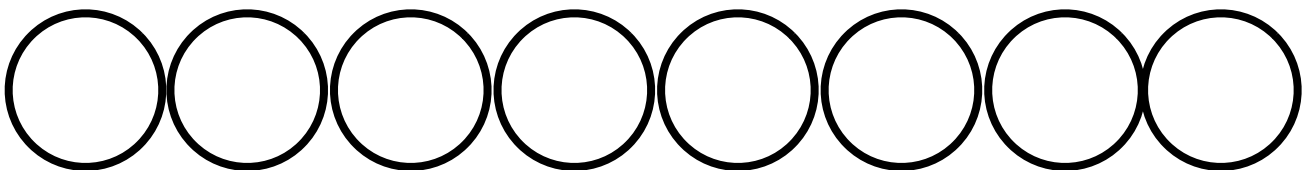
Changing Places 3

to
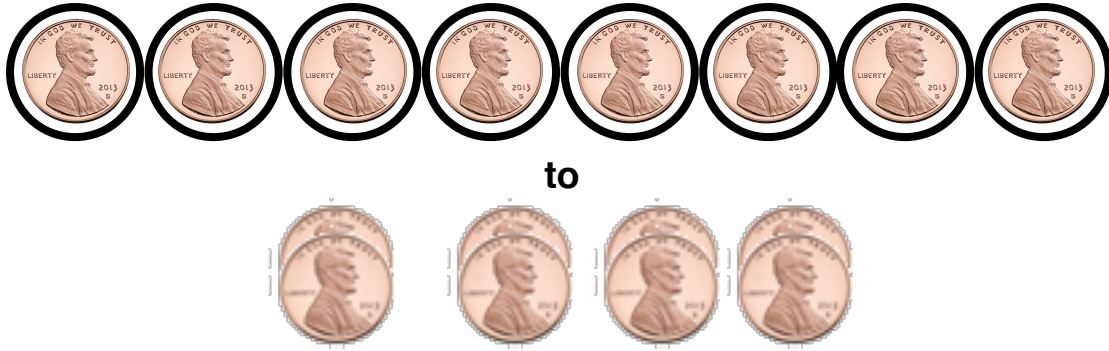
Place eight pennies in a row in the circles below. The goal is to move the pennies so that the eight pennies end up in four stacks of two pennies each.

A move consists of jumping in one direction **one** penny over **the next two pennies** and stopping on the top of the third penny. That can happen by jumping 2 single pennies or one stack of two pennies. You are jumping over 2 single pennies or 1 stack of two pennies and not counting empty spaces that will occur. This can be done in four moves.

Remember to record your movements so you can reproduce the solution.

Changing Places 3 Solution

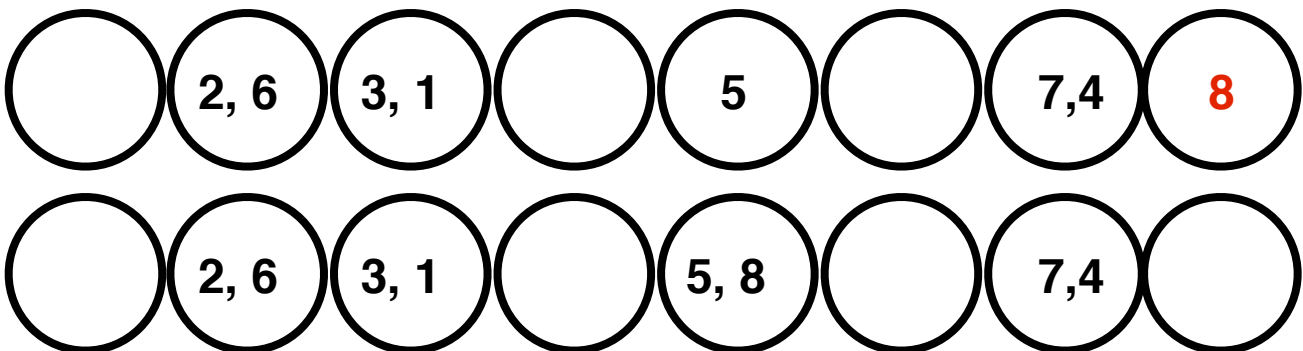**Penny 4 and jumps penny 5 and penny 6 to land on penny 7**

1	2	3	**4**	5	6	7	8

1	2	3		5	6	7,4	8
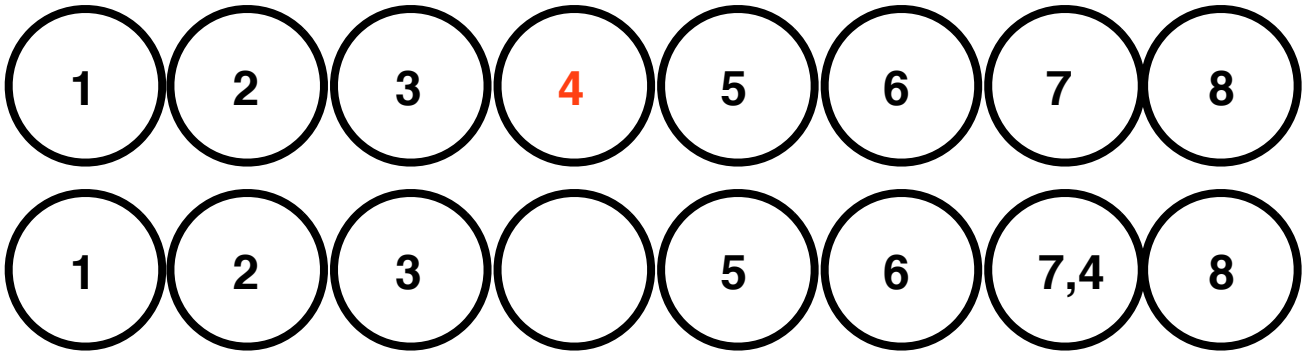
Penny 6 and jumps penny 5 and penny 3 to land on penny 2

1	2	3		5	**6**	7,4	8

1	2, 6	3		5		7,4	8
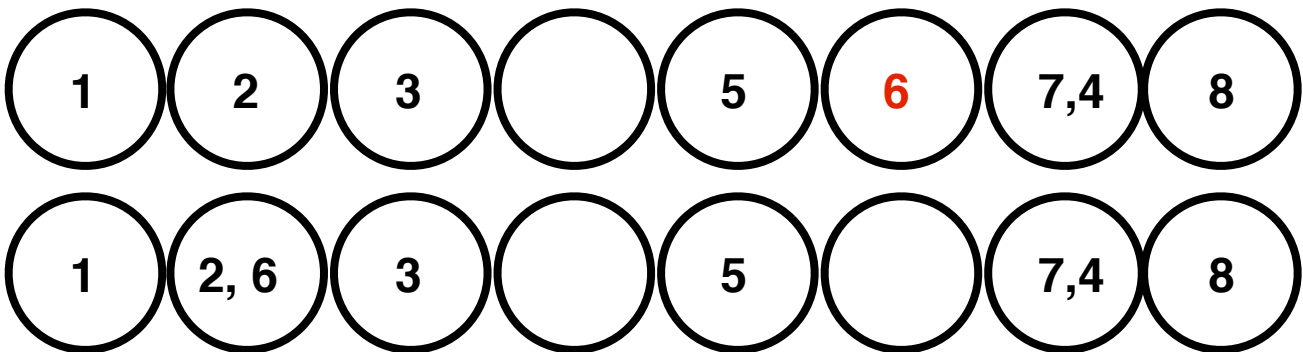
Penny 1 and jumps the stack of 2 and 6 and lands on penny 3

1	2	3		5	**6**	7,4	8

	2, 6	3, 1		5		7,4	8
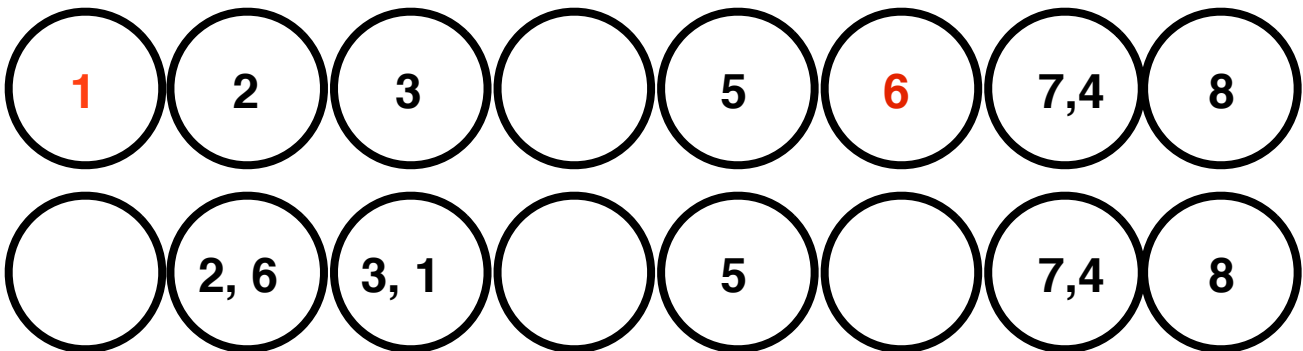
Penny 8 and jumps the stack of 7 and 4 and lands on penny 5

	2, 6	3, 1		5		7,4	**8**

|	2, 6	3, 1		5, 8		7,4	
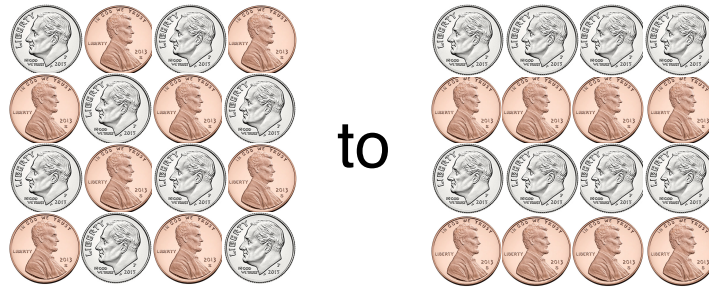
Pennies and Dimes

Arrange 8 pennies and 8 dimes as show in the figure above. Each row has alternating dimes and pennies. Move 2 coins at a time to rearrange the rows so that the dimes are in two alternating rows and the pennies are in two alternating rows as shown at the right above. Each move consists of sliding a single penny to a new location.Each move consists in placing two of your fingertips on any 2 COINS, and sliding those two coins to a new position.   When you move the two coins to the new location they both must each end up touching another coin. This can be done in 3 moves for most people. It can also be done in one move by a clever person.
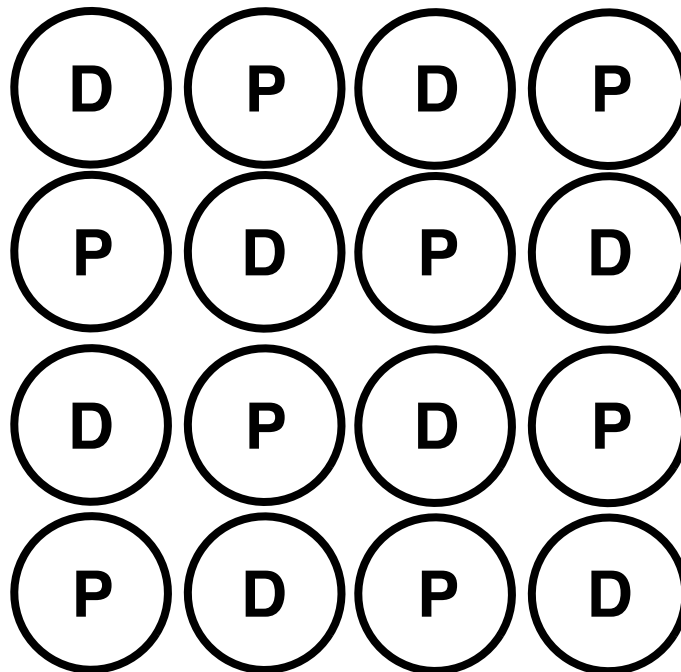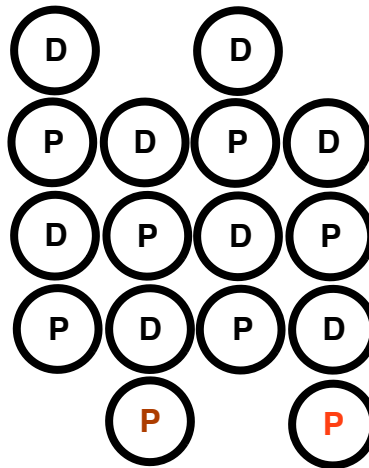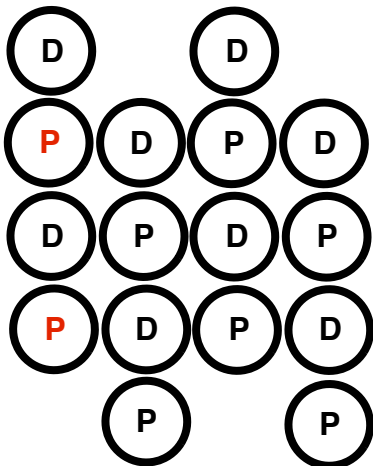
Pennies and Dimes Solution

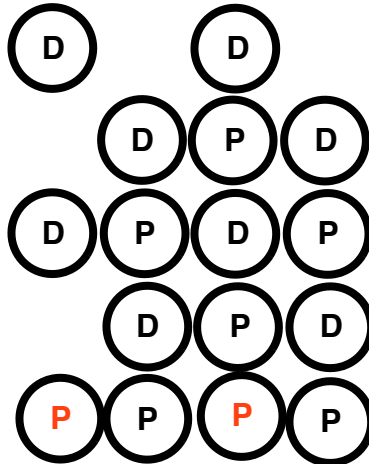Move the 2 pennies in red on the top row to the 2 spots under the dimes on the bottom row.
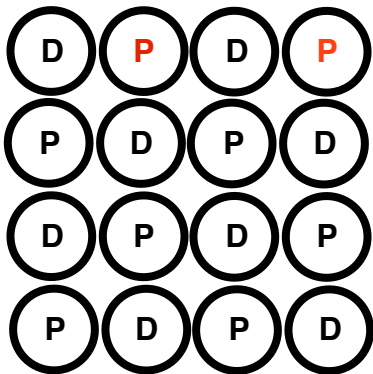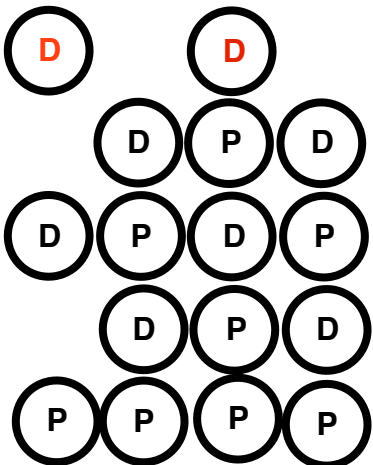

to get

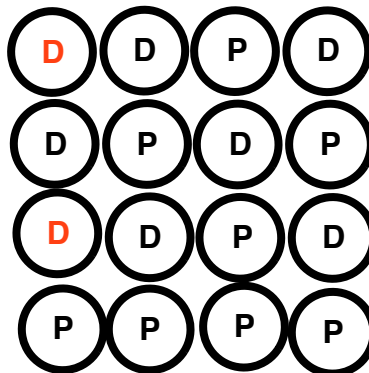Move the 2 pennies in red on the left column to the 2 open spots in the bottom row.

to get

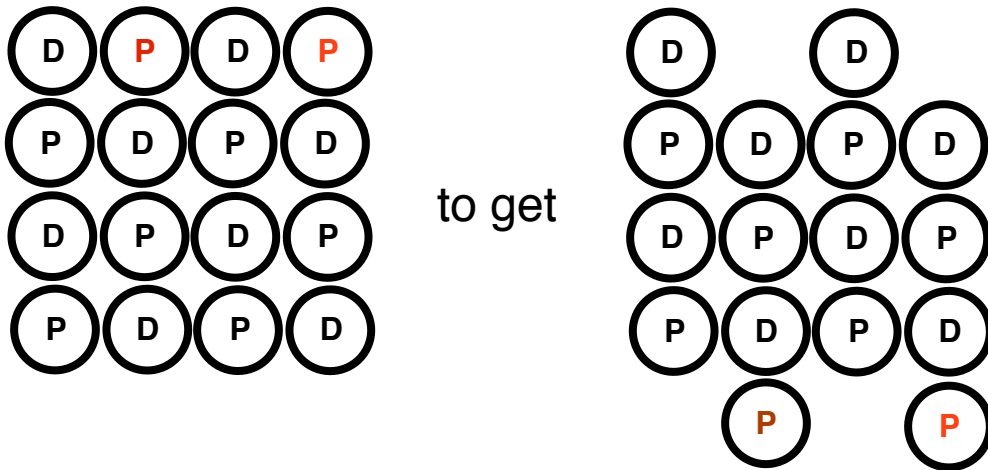Move the 2 dimes on the top row to the 2 open spots on the left column.
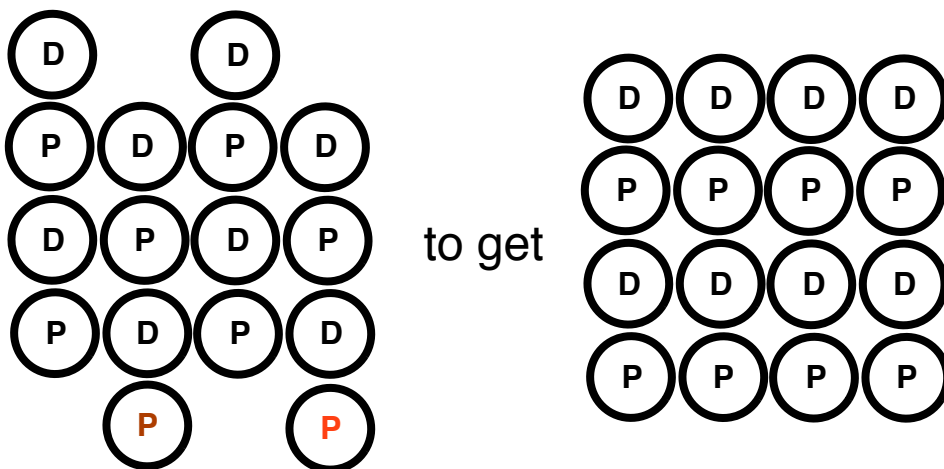

to get

Pennies and Dimes 1 move Solution

Move the 2 pennies in red on the top row to the 2 spots under the dimes on the bottom row.

| D | P | D | P |

| P | D | P | D |

| D | P | D | P |

| P | D | P | D |

to get

| D | | D | |

| P | D | P | D |

| D | P | D | P |

| P | D | P | D |

| | P | | P |

And then push the 2 pennies upward moving the coins above them up 1 row.

| D | | D | |

| P | D | P | D |

| D | P | D | P |

| P | D | P | D |

| | P | | P |

to get

| D | D | D | D |

| P | P | P | P |

| D | D | D | D |

| P | P | P | P |

push the red pennies upwards

NOTE: This solution is a "theoretical" solution in most cases. In truth, it is hard to bang the 2 pennies into the rows above them and move the coins in a straight line without a lot of practice. This shows the different between a good diagram and trying it in real life.