Advanced SQL Puzzles

Sequence, Selection, Iteration

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www.advancedsqlpuzzles.com

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I would be happy to receive corrections, additions, new tricks and techniques, and other suggestions.
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The latest version of this document can be found at www.advancedsqlpuzzles.com

Puzzle #1

Double or Add 1

Write a program where you start with 10 cents, and with each iteration, you can double your current amount or add 1 dollar. What is the smallest number of iterations would it take to reach 1 million dollars?

Answers to the puzzles are located in the following GitHub repository.
https://github.com/smpetersgithub/AdvancedSQLPuzzles/tree/main/Sequence%2C%20Selection%2C%20Iteration

Puzzle #2

Dice Throw Game

Given 1 million trials, what is the average number of dice throws needed to reach 100 points given the following rules?

- Starting at 0, for each dice throw resulting in 1 through 5, add the dice amount to your score.
- If you roll a 6, re-roll the dice and reduce your score by this amount. You cannot go lower than 0 points.

What was the least/greatest number of dice throws to reach 100 points?

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https://github.com/smpetersgithub/AdvancedSQLPuzzles/tree/main/Sequence%2C%20Selection%2C%20Iteration

Puzzle #3

Jospehus Problem

Solve the Josephus Problem.

Once solved, any counting game (such as Eeny, Meeny, Miney, Moe) becomes quite simple.

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Puzzle #4

Non-Adjacent Numbers

Given the ordered set of numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10; how many total arrangements of these numbers are possible where no two adjacent entries are adjacent numbers?

For example, the arrangement 1, 3, 5, 7, 9, 2, 4, 6, 10 would fit the criteria as no two entries are adjacent numbers

The arrangement 1, 2, 4, 6, 8, 10, 3, 5, 7, 9 would not fit the criteria as 1 and 2 are adjacent numbers.

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Puzzle #5

Add the Numbers Up

Given the ordered numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and a + or – sign anywhere between the digits; create all possible permutations and the amount in which they add up to.

Here are some examples:

1 + 2 - 3 + 4 - 567 + 8910 = 8347
12 + 3 - 4 + 56 – 789 + 0 = -722
1 + 2345678910 = 2345678911
1 - 2345678910 = -2345678909

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Puzzle #6

High-Low Card Game

Write a program that shuffles a deck of cards and plays a game of High-Low.

The game is played by receiving a card and then determining if the next card will be of higher or lower value based upon probability. If the probability predicts the next card will be of the same value, or any of the probabilities of high, low or of the same value match, the computer must make a random decision between higher or lower.

Document an iteration through a deck of cards and if the probability matched the outcome.

Answers to the puzzles are located in the following GitHub repository.
https://github.com/smpetersgithub/AdvancedSQLPuzzles/tree/main/Sequence%2C%20Selection%2C%20Iteration

Puzzle #7

Pascal's Triangle

If you are unfamiliar with Pascal's Triangle, please review the Wikipedia page here.

For any row or position in Pascal's Triangle, can you compute the expected value?

Answers to the puzzles are located in the following GitHub repository.
https://github.com/smpetersgithub/AdvancedSQLPuzzles/tree/main/Sequence%2C%20Selection%2C%20Iteration

Puzzle #8

Permutations of 0 and 1

Can you display all permutations of the combination of 0 and 1 with a length of 6 characters?

Here are some examples:

000001,
101010,
001100,
111111,
000000,
000100,
011101, etc.…

Answers to the puzzles are located in the following GitHub repository.
https://github.com/smpetersgithub/AdvancedSQLPuzzles/tree/main/Sequence%2C%20Selection%2C%20Iteration

Puzzle #9

Permutations 1 through 10

Can you display all 2-digit permutations for the numbers 1 through 10?

Here are some examples:

1 and 2,
1 and 3,
1 and 4,
2 and 1,
2 and 3, etc…

Answers to the puzzles are located in the following GitHub repository.
https://github.com/smpetersgithub/AdvancedSQLPuzzles/tree/main/Sequence%2C%20Selection%2C%20Iteration