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Puzzle Solving Live- Part-1

Special class

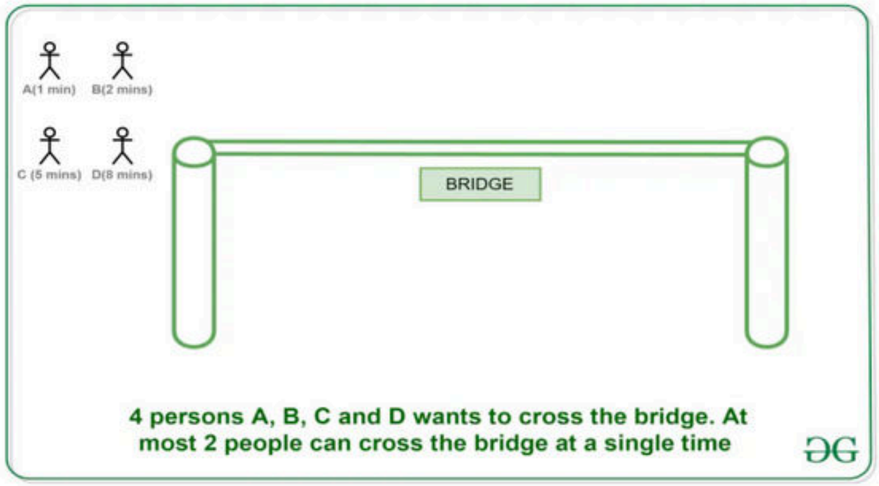
Rohit Negi • Oct 3, 2023

Puzzle

1: There are 4 persons (A, B, C and D) who want to cross a bridge at night.

1. A takes 1 minute to cross the bridge.
2. B takes 2 minutes to cross the bridge.
3. C takes 5 minutes to cross the bridge.
4. D takes 8 minutes to cross the bridge.

There is only one torch with them and the bridge cannot be crossed without the torch. There cannot be more than two persons on the bridge at any time, and when two people cross the bridge together, they must move at the slower person's pace.



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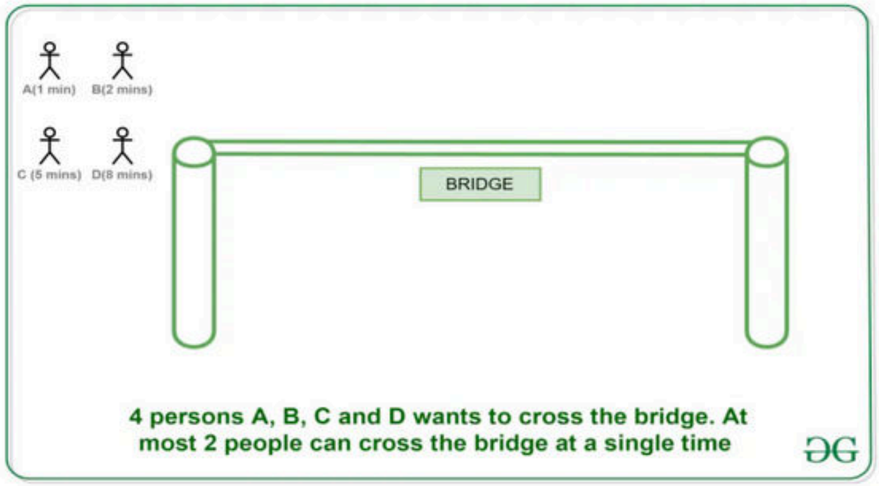


Solution:

Step 1: A and B cross the bridge. A comes back. Time taken **3 minutes**. Now B is on the other side.

Step 2: C and D cross the bridge. B comes back. Time taken **8 + 2 = 10 minutes**. Now C and D are on the other side.

Step 3: A and B cross the bridge. Time taken is **2 minutes**. All are on the other side.

Total time spent: 3 + 10 + 2 = 15 minutes.

2: In a ***one day international cricket match***, considering no extras(no wides, no 'no' balls, etc.) and no overthrows.

What is the maximum number of runs that a batsman can score in an ideal case ?

Note:"Here we assume an ideal and little practical scenario. We assume that a batsman can not run for more than 3 runs in a ball, as otherwise there is no limit, he can run infinite runs(theoretically) in a ball, as long as the opposite team does not catch the ball."

Solution: **49***(6*5+3)+(6*6)= **1653**

3: There is a room with a door (closed) and three light bulbs inside the room. Outside the room, there are three switches, connected to the bulbs. You may manipulate the switches as you wish, but once you open the door you can't change them. All bulbs are in working condition and you can open the door only once. Identify each switch with respect to its bulb.

Solution: Let the bulbs be X, Y, and Z

Turn on switch X for 5 to 10 minutes. Turn it off and turn on switch Y. Open the door and touch the light bulb.

1. the light is on from the bulb, it is Y

Now we will check the other two off bulbs

2. the bulb which is hot, is X

3. the bulb which is cold, is Z

Puzzle 4: Alok has three daughters. His friend Shyam wants to know the ages of his daughters. Alok gives him a first hint.

1. The product of their age is 72.

Shyam says this is not enough information Alok gives him a second hint.

2: *Shyam goes out and looks at the house number and says "I still do not have enough information to determine the ages".*

Alok admits that Shyam can not guess and gives him the third hint

3. The oldest girl likes strawberry ice cream.

Shyam is able to guess after the third hint. Can you guess what the ages of the three daughters are?

1. Product of ages is 72

Below are all possibilities to get 72 from product of three different ages:

*1 * 1 * 72 = 72*

*1 * 2 * 36 = 72*

*1 * 3 * 24 = 72*

*1 * 4 * 18 = 72*

*1 * 6 * 12 = 72*

*1 * 8 * 9 = 72*

*2 * 2 * 18 = 72*

*2 * 3 * 12 = 72*

*2 * 4 * 9 = 72*

*2 * 6 * 6 = 72*

*3 * 3 * 8 = 72*

*3 * 4 * 6 = 72*

2. Sum of the ages is given

1 + 1 + 72 = 74

1 + 2 + 36 = 39

1 + 3 + 24 = 28

1 + 4 + 18 = 23

1 + 6 + 12 = 19

1 + 8 + 9 = 18

2 + 2 + 18 = 22

2 + 3 + 12 = 17

2 + 4 + 9 = 15

2 + 6 + 6 = 14

3 + 3 + 8 = 14

3 + 4 + 6 = 13

All sums are unique except 14. So the age sum must have been 14, otherwise, Shyam would have guessed the ages from hint 2 only.

So we have two possible combinations to get a sum of 14

2 + 6 + 6 = 14

3 + 3 + 8 = 14

3. Alok has the oldest girl (not two!!). So the ages must be 3, 3 and 8.

5: An employee works for an employer for 7 days. The employer has a gold rod of 7 units. How does the employer pay to the employee, so that the number of employee's rod units increases by one at the end of each day? The employer can make at most 2 cuts in the rod.

Solution: Solution:

The employer can pay for seven days by making 2 cuts in a way that he has 3 rods of size 1, 2 and 4.

1st Day: Employer gives 1 unit cut.

2nd day: Takes back 1 unit cut from employee given on the first day and gives 2 unit cut.

3rd Day: Gives 1 unit and then the employer is left with 4 unit rod lengths.

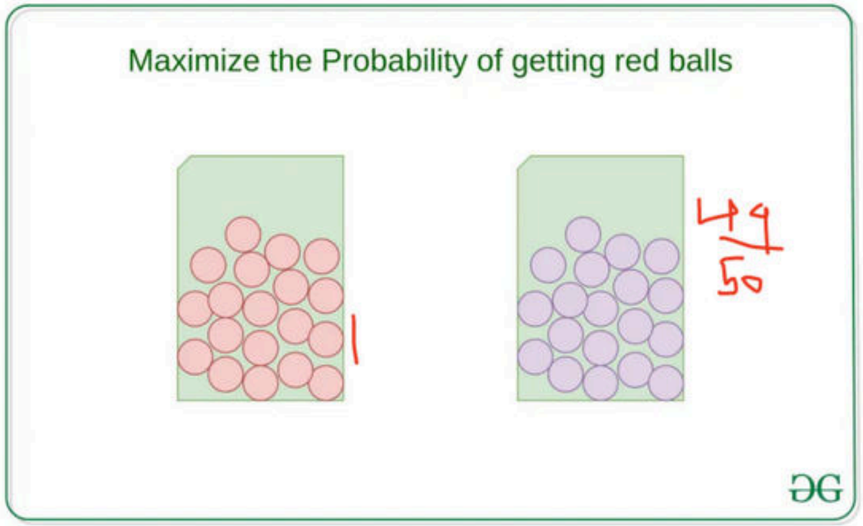
4th Day: Takes back cuts of 1 and 2 units. Gives the cut of 4 units.

5th Day: Gives cut of 1 unit to the employee.

6th Day: Takes back cut of 1 unit and gives a cut of 2 units.

7th Day: Gives cut of 1 unit to the employee.

6: Give two boxes B1 and B2 one have 50 red marbles and other have 50 blue marbles. A ball is selected randomly from any of the box and the task is to maximize the probability of selecting a red ball, by reshuffling marbles in both the boxes.



$\frac{1}{2} \times 1 + \frac{1}{2} \times 0$

$\frac{1}{2} \times 1 + \frac{1}{2} \times \frac{49}{99}$

If we decrease the number of red balls in box B1 and increase the number of red balls in box B2 then the probability of getting a red ball will be maximized.

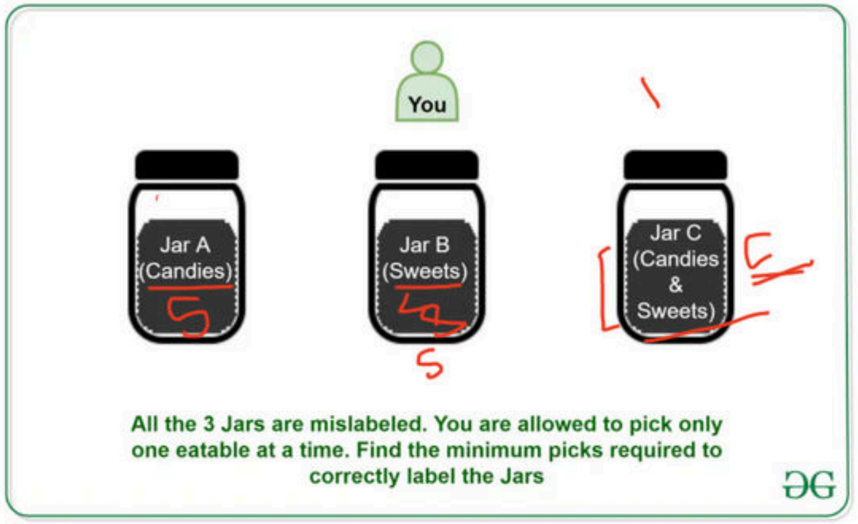
Therefore, let us take 49 red marbles from B1 to B2 then there will be 1 red ball in B1 and 99 balls in B2 out of which 49 are red and 50 of them are blue in the second jar.

Then: *P (R) = ((1 / 2) * (1 / 1)) + ((1 / 2) * (49 / 99)) = 0.747474*

7: There are 3 jars, namely, A, B, C. All of them are mislabeled. Following are the labels of each of the jars:

- *A: Candies*
- *B: Sweets*
- *C: Candies and Sweets (mixed in a random proportion)*

You can put your hand in a jar and pick only one eatable at a time. Tell the minimum number of eatable(s) that has/have to be picked in order to label the jars correctly.



Assume that the shape of the candies and sweets are identical and there is no way to differentiate them by touching alone.

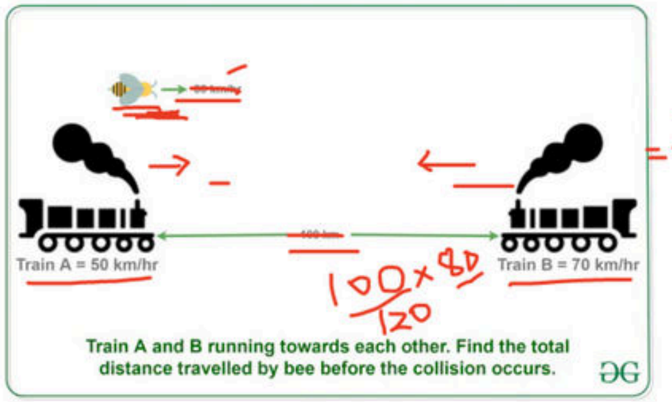
Solution: 1 pick of an eatable is required to correctly label the Jars.

You have to pick only one eatable from jar C. Suppose the eatable is a candy, then the jar C contains candies only(because all the jars were mislabeled).

Now, since the jar C has candies only, Jar B can contain sweets or mixture. But, jar B can contain only the mixture because its label reads “sweets” which is wrong.

1. Therefore, Jar A contains sweets. Thus the correct labels are:
    - A: Sweets.
    - B: Candies and Sweets.
    - C: Candies.

8: Two trains are on same track and they are coming toward each other. The speed of the first train is 50 km/h and the speed of the second train is 70 km/h. A bee starts flying between the trains when the distance between two trains is 100 km. The bee first flies from first train to second train. Once it reaches the second train, it immediately flies back to the first train ... and so on until trains collide. Calculate the total distance travelled by the bee. Speed of bee is 80 km/h.

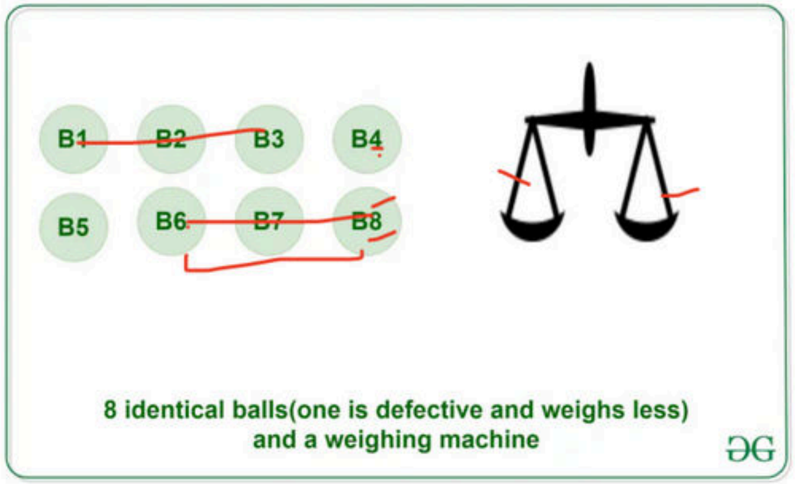


$D = S \times T$

$\frac{100}{1}$

Solution: 66.67 km approx.

9: You are provided with 8 identical balls and a measuring instrument. 7 of the eight balls are equal in weight and one of the eight given balls is defective and weighs less. The task is to find the defective ball in exactly two measurements.



10 : There are 5 pirates, they must decide how to distribute 100 gold coins among them. The pirates have seniority levels, the senior-most is A, then B, then C, then D, and finally the junior-most is E.

Rules of distribution are:

1. The most senior pirate proposes a distribution of coins.
2. All pirates vote on whether to accept the distribution.
3. The distribution is approved if at least half of the pirates agree (including the proposer)
4. If the distribution is accepted, the coins are disbursed and the game ends.
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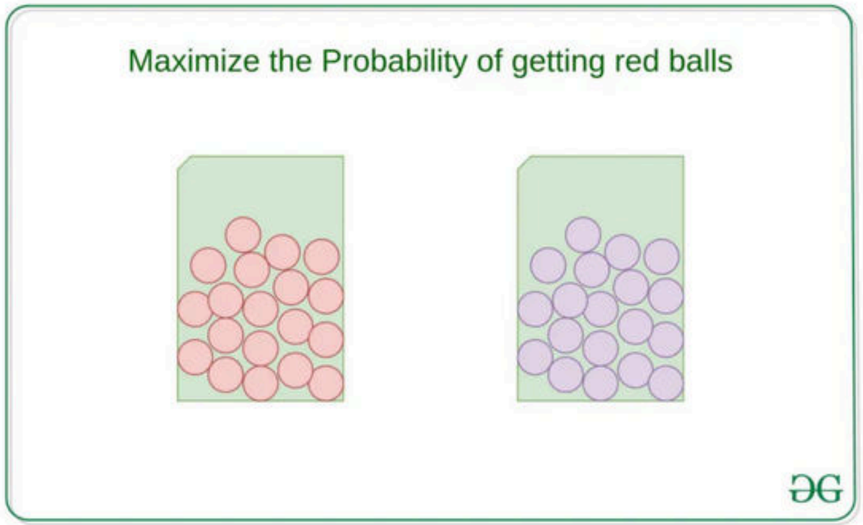

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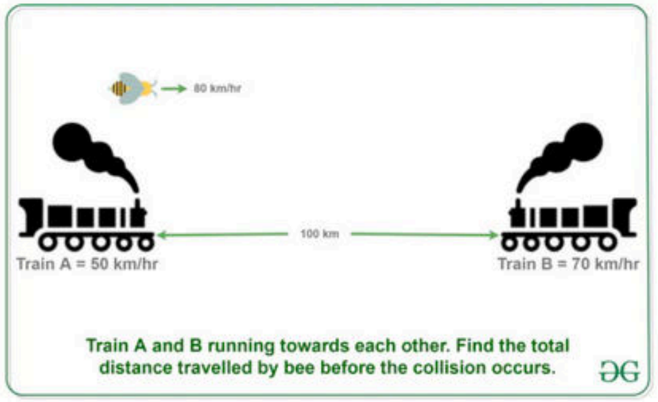

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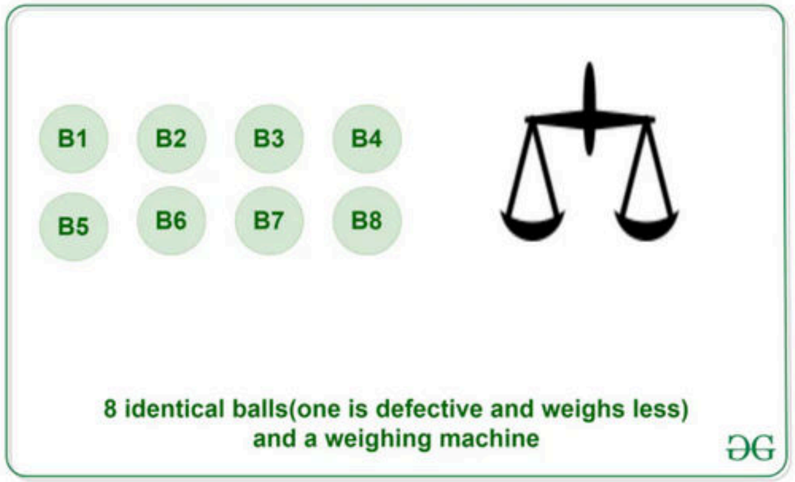

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