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Solutions to Faithful Foes, from Puzzles for Programmers and Pros

Translations, Sudoku and the hidden place

Pete:

You are at the Gare de Montparnasse. To start, we have an apology to make. We Templars are in fact an honorable if secretive society. But honor doesn't preclude occasional deception. Even Bernard de Clairvaux had to promise more than we had to offer in our earliest years. So it is that we have deceived you in order to separate you from Rose. We have bent your ears with dreams of riches and you allowed yourselves to be persuaded.

Amalea:

You are at the Gare de Lyon. You were quite gullible. Americans often chase after great wealth. But dreams of riches tempt many people, so you are not alone. Gold and stories of ancient coins make people lose all reason. At the height of our power in the late 13th century, we manipulated paupers and princes with handfuls of gold. Don't blame Cheri and Scot. Scot was badly roughed up by those heathen Warriors of the Capture. He needed a lucky break. Cheri needed the money. The coins are real. She'll be able to pay off her creditors. Too bad universities in America are so expensive.

Cheri:

You are at the Place de la Bastille. Just as you shouldn't blame Scot or Cheri, you needn't worry about Rose. We mean her no harm. We just need information. Why couldn't we just ask her? Well, in her conscious mind, she may not remember, but her unconscious may. We must probe it.

Christie:

You are at the Gare d'Austerlitz. When we say we are going to probe her unconscious mind, we did not mean this in a bad way. We don't use drugs. Our order knows many secret and painless ways of acquiring information from people. We used hypnosis way before Mesmer. We brought it back from our visits to koptic Egypt. Rose will be safe from all distraction in our tunnels beneath Paris.

Brad:

You are at the Place Jeanne d'Arc. You may not know this, but Paris, below the ground, resembles a large swiss cheese. Through the long history of the city, even when the city was called Lutezia by the Romans, Parisians dug tunnels underground to get building material. In 17th and 18th centuries, entire streets of Paris collapsed because of the swiss cheese-like caverns underneath (we French call this Gruyere). In 1777, Guillaumot, secretly of our order, was appointed to take charge of the underground passageways in order to prevent them from collapsing. He closed off some tunnels, reinforced others for public use, and kept a few for our private use. Some of the best are the oldest, especially in what is now the fifth arrondissement.

Will:

You are at Porte d'Orleans. For example, we took over the baths at Cluny, rather far from where you are now. Those had wonderful tunnels. We also managed the earliest catacombs burying skeletons

and treasure when we learned of the attack by Philippe II.

Jason:

You are at Notre Dame. May he burn in hell, that evil Philippe II. He had grown jealous of our wealth and had most of us murdered burned at the stake. It's a lesson of history that if an identifiable group without substantial threat of force becomes too wealthy, its wealth will be stolen. It was as true for us in those years of fire as it has been for the chinese of southeast Asia. We were partly at fault.

Scot:

You are at Place de la Nation. We flaunted our wealth too much. Though our order had started as one of poor knights, we had acquired lands and means of manufacture and, through our services to pilgrims, vast monetary wealth. We were looked on with suspicion and jealousy. Two centuries after our near total destruction, Martin Luther created an alternate christian vision.

Mike:

You are at Le Senat. Some of our number, so furious at the church of Rome for its participation in our near extermination, joined it. We have always provided the children of Luther with their most dedicated members. Unfortunately, some turn to fanaticism especially regarding the misunderstood book of revelation. That is where the Warriors of the Rapture come in. We think they had planned big things, big, bad, and destructive. Their successors call themselves Fall of Babylon. They are more fanatical still. Oh, we agree the world has become bad. Beauty, kids playing and laughter want to be universal. Instead we have power madness, greed, dirty bombs, cluster bombs and hairspray bombs. But they don't want peace. What they want is a cleansing war, whatever that might mean.

Rose:

Dear Mom, dear Dr. Ecco,

I've asked my captors whether I could write a letter. They said that it was OK, but I had to take precautions to avoid its falling in the wrong hands. So they said they would encrypt it after I wrote it. If you've read this far, it's probably OK.

First you have to know that I think I'm going to be OK. They will take me away but not for too long. They told me they won't harm me in any way. I don't know where I'm going either, but I do have some information.

Second, I know where my friends were sent: Gare Montparnasse, Gare de Lyon, Place Jeanne d'Arc, Porte d'Orleans, Place de la Bastille, Place de la Nation, le Senat, Gare d'Austerlitz, and, naturally I guess, Eglise Notre Dame.

Third, they've told me that you will be able to find me through an entrance in a certain theatre well enough. They're not too clear about this theatre in fact. I'm not sure whether it's still active or not but they say it's old, it used to seat thousands, and many of the performances concerned water and death. Sounds spooky.

Four, they said the location of this theatre is approximately the center (they said "the balance point") of seven of the sites to which my friends were sent. Which seven? Here is what they said: "Suppose you can order the stories in the messages your friends have received, and number them 1 through 9 according to that order. Now here is a sudoku.

```
7 0 0 0 0 0 6 4
0 0 6 0 0 0 0 0
0 0 0 0 0 8 0 2 0
5 6 3 0 0 0 0 0
0 0 0 0 7 0 2 0 9
0 0 0 0 0 0 0 0
0 5 0 0 0 0 3 0 0
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0 0 0 4 0 0 0 9 0
1 7 0 9 0 0 0 0 8

You'll notice the sixth line is all 0s (0s correspond to blanks). When you solve this sudoku, look at the first seven numbers in that line. There might be a few solutions. If so, know that the women have been sent to relevant locations. Figure out the locations corresponding to those numbers from the messages. Find the balance point. You will be close to the tunnel entrance."

I don't know any more than that. Please come find me, as soon as you can. I say that I trust them, but not that much. (if they translate that line, it's a good sign.)

Love, Rose.

A good solution to the sudoku is:

7 9 8 5 3 2 1 6 4
2 3 6 1 9 4 8 7 5
4 1 5 7 6 8 9 2 3
5 6 3 2 8 9 4 1 7
8 4 1 6 7 5 2 3 9
9 2 7 3 4 1 5 8 6
6 5 9 8 1 7 3 4 2
3 8 2 4 5 6 7 9 1
1 7 4 9 2 3 6 5 8

The theatre is Arènes de Lutèce in Rue Monge.

Final note:

Welcome, Dr. Ecco. For it must be you if you've come this far. You'll be able to find us. But don't get lost. We, including Rose, are within 160 meters of this entrance, but it's very dark. The tunnels are all at a single level, but we may be in an interior room. When you find us, you'll know it because the stone is replaced by smooth steel.

Instruction to maze:

... If so, back up to the last fork. Also, if you happen to meet your own rope (meaning you have walked a circuit), back up to the last fork. If you reached a dead end, mark that tunnel as visited. Otherwise, mark the tunnel as (probably) to be visited again, and leave a note at that fork on how many meters rope there are still available. Then try the next leftmost tunnel. When you tried all tunnels, back up to the last fork. Mark the tunnel through which you returned as visited, if all tunnels you can reach via the next fork are visited. Otherwise leave a note like before.

Now, whenever you reach a note you left some time ago (meaning you can reach that place along several ways), proceed as follows: if you have more rope available than the largest amount noted there, leave another note on how many meters of rope you have now available. You will be probably be back soon, but for now, simply return and continue. Otherwise, if you have no more rope available than the largest amount noted there, simply back up and mark the entrance of the tunnel through which you return as visited.

If you return to the starting point, and haven't found the target, you have to start another try. Walk the maze the same way, but leave out all tunnels marked as visited. If you reach a fork with a note left, return if you have less rope left than the largest entry on the note, or if there is no larger entry than the first one. In this case, mark the tunnel through which you return as visited. Otherwise, if you have the largest amount of rope available, (this should happen only once per fork), visit all the tunnels marked as to be visited again, from left to right. Proceed as in the first part. If you return through a tunnel and have marked all subsequent tunnels as visited, mark this tunnel as visited also. Otherwise, it remains to be visited again.

You might be forced to repeat this procedure for several times, but at last you will find the room.

(Sorry, I found no simpler way to deal with all kinds of hostile mazes, think of a huge chessboard-shaped maze with entrance in the middle of the first line. Though I'm not too shure this one does...)

Banking and Nim games:

p.205: 1mio each. As Ecco explains on the next page, you cannot choose more than 1mio. On the other hand, if one account had all the 3mios, you get exactly the amount of one check, so you should not choose less.

p.206 top: The first check has to 1mio. The same holds for any further check in case the preceding checks all failed. However, once you got your first million, you are free to try any other strategy; however, to make any guess better than the non-feedback one, you have to have any kind of information about the distribution or their probabilities.

p.206 bottom

first case (difference at least 600.000): choose 1.200.000 for each account. At least one account must hold that amount, for otherwise the amounts would be less than 1.200.000 and twice 600.000, so the total would not add up to 3mios. If you chose more, and the amounts were exactly 1.200.000 and twice 600.000, you would get nothing. If you chose less, and one account had all the 3mios, you would get less.

second case (difference exactly 600.000): choosing 600.000 for each account, all checks will be honored, and you get 1.800.000. For if one account had less than 600.000, the others would have less than 1.200.000 each, and the total would not sum up to 3mios. If you chose more, then one check could fail, if the distribution is exactly like the above. So you had to choose at least 900.000, to get 1.800.000 from two honored checks. However, there might be a distribution like 800.000 twice plus 1.400.000 once, where only one of these checks would be honored.

third case (difference exactly 600.000, with feedback): you can get 1.920.000.

Choose the first check to be 720.000. If it is honored, choose 600.000 for both left checks, which will also be honored (this is independent of the amount of the first check, see second case). This sums up to 1.920.000. If the first check is not honored, choose 960.000 for both remaining checks. This as well sums up to 1.920.000. Since the smallest amount is less than 720.000, the largest amount will be less than 1.320.000, and the middle amount (and hence the largest one also) will be more than 3mio- $(720.000+1.320.000)=960.000$. Hence both checks will be honored.

If the first check is honored, the remaining accounts could be 600.000 each, so if the first check were less than 720.000, or the remaining checks were other than 600.000, you could get less in the total.

If the first check is not honored, to get more than 1.400.000, both remaining checks have to pay, because a single account cannot have more than 1.400.000, see above. Hence their amount has to be the guaranteed value of the middle account, which is computed the same way as above. But replacing 720.000 by any larger number, one sees that this value will decrease. So the first check should not be larger, and in case of honoring, the remaining checks should be exactly the described amount.

p.216: yes. Choosing 1 as Exclusion Exception will guarantee to win.

The game would proceed (probably) as follows:

20 - 17 - 16 - 13 - 12 - 9 - 8 - 5 - 3 - 2 - 1 - 0

Obviously Elder's last choice to reach 2 is forced by exclusion rule. Ecco's choice to reach 1 is the only application of the exception rule.

Now Elder is forced to choose to reach 17, 13, 9 and 5, because otherwise Ecco would have a winning strategy in ordinary Exclusion Nim as follows:

If Elder misses one of these numbers (which are the ones of form $4N+1$), Ecco can reach it in his next turn. If then Elder takes 1 or 3, Ecco will take 3 or 1 to reach the next of these numbers. If Elder takes 2, Ecco takes 1. Elder cannot take 1 again, by exclusion. So he takes 2 or 3, and Ecco takes 3 or 2, respectively, to end up again with a number $4N+1$. So Ecco reaches 1 at last and wins, or reaches 2 by taking 1 from 3, and wins again by exclusion.

p.217: Shift the funds so that, if the highest account has amount X , the others have $X/2$, $X/3$, $X/4$, $X/5$, $X/6$, $X/7$ and $X/8$ respectively.

The total amount of all accounts will then be about 2.46 times X .

If the checks have all an amount of Y which is larger than X/N but less or equal to $X/(N-1)$, for some N , then exactly N checks will be honored, with total amount strictly between $N \cdot X/N = X$ and $N \cdot X/(N+1) < X$. If the checks are all equal to some X/N , the total will be exactly $N \cdot X/N = X$ with the same arguing. So the largest amount to gain is X , which is roughly $1/2.46$ of the total amount the bank holds.

On the other hand, consider any distribution $A_1 \geq A_2 \geq \dots \geq A_8$. To avoid a total honored checks of more than X , one must have $A_1 \leq X$, $A_2 \leq X/2$, $A_3 \leq X/3$ etc., for choosing A_N will gain $N \cdot A_N$. So the solution is unique, hence best.

Decryptions and Encryptions

calvert is already at brive who else knows

believe elder will go to zurich to bank be ready

22C648EAC06CE5A9BB54913523910B06A71A4A7A437533934892C9A7174C031