LOGICAL PROBLEMS Edited

PROBLEM # 1:

In a certain mythical community, politicians never tell the truth and non-politicians always tell the truth. A stranger meets three natives and ask the first of them," Are you a politician? "The first native answers the question .The second native then reports that the first native denied being a politician .The third native says that the first native is a politician.

How many of these three natives are politicians?

SOLUTION:

If the first native is a politician then he lies and denies being a politician, but if he tells the truth and denies being a politician, in either case, then, the first native denies being a politician.

Since the second native reports that the first native denies being a politician, he tells the truth, and is therefore a non-politician.

The third native asserts that the first native is a politician, if the first native is a politician, then the third native speaks the truth and is therefore a non-politician, but if the third native lies he is, therefore, a politician. Hence only one of the first and third native is a politician, and since the second is a non-politician, there is only one politician among the three natives.

PROBLEM # 2:

Of three prisoners in a certain jail, one had normal vision, the second had only one eye and the third was totally blind .the jailor told the prisoners that from three white hats and two red hats, he would select three and put then on the prisoners' heads. None could see what color hat he wore. The jailor offered freedom to the prisoner with normal vision if he could tell what color hat he wore. To prevent a weakly guess the jailor threatened execution for any incorrect answer .the first prisoner could not tell what hat he wore. Next the jailor made the second offer to the one eyed prisoner. The second prisoner could not tell what he wore either. The jailor did not bother, but

he agreed to extend the same terms to that prisoner, but when he made the request, the blind prisoner said:

“I do not need to have my sight; from my friends with eyes have said, I clearly see my hat is_____!

Then did he know?

SOLUTION:

It is very difficult to answer to this question. But rather impossible.

Many problems are not accurately described, and their miss description may prove so miss leading that no solution can part or parts of the description of the problem need to be rejected or replaced. But we cannot do this by over selves.

From the premises given in the problem, we can prove that he wore red but we can also prove that he wore white hat.

Normal Vision	W	**R**	W	R	W
One eye man	W	W	**R**	**R**	W
Blind man	W	W	W	W	**R**

W = White R = Red

As at time, he could only wear one hat, either read or white, so it is impossible to construct a conclusion. It indicates that problem is incomplete.

Some problems in the real world more over even when they are described accurately may be incomplete in that some thing not originally available may be essential for the solution. The solution may depend on some additional scientific discovery or some previously.

Unimagined invention or equipment, or the search of some as yet unexplored territory. But in the statement of the problem, all the information that is sufficient for the solution must be given; other wise we feel that the mystery writer or the problem maker has been unfair to us.

PROBLEM # 3:

On a certain train, the crew consists of the brakeman, the fireman and the engineer. Their names listed alphabetically are Jones, Robinson, and Smith. On the train are

also three passengers with corresponding names; Mr. Jones, Mr. Robinson and Mr. Smith. The following facts are known.

a) Mr. Robinson lives in Detroit.

b) The brakeman lives halfway between Detroit and Chicago.

c) Mr. Jones earns exactly $ 20000 a year.

d) Smith once beat the fireman at billiards.

e) The brakeman's next-door neighbor, one of the three passengers mentioned, earns exactly three times as much as the brakeman.

f) The passenger living in Chicago has the same name as the brakeman.

What is the engineer's name?

SOLUTION:

First of all we make a chart from the above given information that is;

Name	Brakeman	Fireman	Engineer
Jones	1 **Y**	2 X	3 X
Robinson	4 X	5 **Y**	4 X
Smith	7 X	8 X	9 **Y**

Y = OK X = Cancel

From (d), smith is not fireman as, once he beat the fireman at billiards. So cancel 8.

From (e), Mr. Jones is not his neighbor because he does not earn exactly three times as much as Brakeman. Because he earns $20,000 a year which is not divisible by 3.

From (f), the name of Brakeman is Jones because Mr. Jones is not Break man's neighbor

And Brakeman lives in half way between Detroit and Chicago. While Mr. Robinson lives in Detroit. So Mr.Jones is only passenger who lives in Chicago. Cancel 4 and 7 and 2 & 3.

Now from the chart it is clear that Smith is engineer. Cancel 6 while Robinson is the fireman.

PROBLEM # 4:

The employee of a small loan company is Mr. Black, Mr. White, Mrs. Coffee, Miss Ambrose, Mr. Kelly and Miss. Earn Shaw. The positions they occupy are manager, assistant manager, cashier, stenographer, teller and clerk. Though not necessary in that order.

The following facts are known:

a) The assistant manager is the manager's grandson.
b) The cashier is the stenographer's son in law.
c) Mr. Black is a bachelor.
d) Mr. White is twenty years old.
e) Miss Ambrose is the teller's stepsister.
f) Mr. Kelly is the manager's neighbor.

Who holds each position?

SOLUTION:

	Manager	Assistant Manager	Stenographer	Cashier	Teller	Clerk
Mr. Black	1 X	2 **Y**	3 X	4 X	5 X	6 X
Mr. White	7 X	8 X	9 X	10 **Y**	11 X	12 X
Mrs. Coffee	13 **Y**	14 X	15 X	16 X	17 X	18 X
Miss Ambrose	19 X	20 X	21 X	22 X	23 X	24 **Y**
Mr. Kelly	25 X	26 X	27 **Y**	28 X	29 X	30 X
Miss Earn show	31 X	32 X	33 X	34 X	35 **Y**	36 X

X = Cancel Y = OK

From (a), Mrs. Coffee, Miss.Earnshow and Miss Ambrose cannot be assistant Manager, so cancel 14,20 and 32 and also Miss Ambrose and Miss Earnshow cannot be Manager as they are unmarried so cancel 19 and 31.

From (b), as cashier is male so cancel 16, 22, and 34, as they are females. Also cancel 21 and 33 because Miss Ambrose and Miss Earn show are not married.

From (c) cancel 1, 3 and 4 because they all are married.

From (d) cancel 9 and 7 because at the age of 20, Mr. White cannot have son in law and grandson.

From (e) cancel 23. She is not teller.

From (f) Mr. Kelly is not manager so cancel 25.

Now from the chart we can easily say that Miss Ambrose is clerk so cancel 6,12,18,30 and 36.

From this it concludes that Miss Earnshaw is teller then cancels 5, 11, 17 and 29.Mr Black is assistant manager cancel 8 and 26.Mr White is cashier so cancel 28. Mr. Kelly is stenographer then cancels 15 and Mrs. Coffee is a manager of a small loan company.

PROBLEM# 5:

Benno Torelli, Genial host at Hamtramcks most exclusive nightclub, was shot and killed by a racketeer gang because he fell behind in his protection payments. After considerable effort on the part of the police, five suspects were brought before the district attorney, who asked them what they had to say for themselves. Each of them made three statements, two true and one false. Their statements were:

LEFTY: I did not kill Torelli. I never owned a revolver in my life. Spike did it.

RED: I did not kill Torelli. I never owned a revolver in my life. The others are all passing buck. .

DOPEY: I am innocent .I never saw Butch before. Spike is guilty.

SPIKE: I am innocent. Butch is the guilty one. Lefty did not tell the truth. When he said I did it.

BUTCH: I did not kill Torelli. Red is guilty one. Doppy and I are old pals.

Who had done it?

SOLUTION:

Since Lefty said that Spike did it, Spike first and third statements an equivalent in remaining, and they're fore either both true or both false. Since one statement is false, they are both true.

Dopey's third statement is therefore false and so her first two are true. Therefore Butch third statement is false and so his first two statements are true, of which the second reveals that Red i.e. the guilty man.

PROBLEM # 6:

Five men who are buddies in the last war are having reunion. They are White, Brown, Peters, Harpen and Nash, who by occupation are painter, writer, and barber, neurologist and heating contractor. By coincidence, they live in the cities of White Plains, Brownville, PeterBurg, Harper'sFerry and NashVille, but no man live in the city having a name similar to his, no does the name of his occupation have the same initial as his name or the name of the city which he lives. The following facts are known:

a- The barber doesn't live in the PeterBurg's and Brown's is neither a heating constructor nor a painter nor does he live in PeterBurg or Harper's Ferry.

b- Mr. Harper lives in NashVille and is neither barber nor writer

c- White is not a resident of BrownsVille, nor is Nash, who is not a barber or a heating contractor. With only the information given, determine the name of the city in which Nash resides?

SOLUTION:

First of all cancel 1, 7, 13, 19 and 25 because no man lives in the city having named similar to his name.

	White Plains	BrownVille	PeterBurg	HarperFerry	NashVille
White	1 X	2 X	3 X	4 **Y**	5 X
Brown	6 **Y**	7 X	8 X	9 X	10 X
Peter	11 X	12 **Y**	13 X	14 X	15 X
Harper	16 X	17 X	18 X	19 X	20 **Y**
Nash	21 X	22 X	23 **Y**	24 X	25 X

X = Cancel Y = OK

From (a), cancel 8 and 9

From (b), Harper lives in NashVille, so cancel 16,17,18 and 5,10,15.

From(c), cancel 2 and 22.

From the chart, it is clear that Brown lives in the WhitePlains so; cancel 11 and 21, and Peter lives in BrownVille.

From (c), Nash is not barber and barber does not live in peter burg. So white lives in Harper Ferry and Nash is the resident of Peterburg.

PROBLEM # 7:

Danial Kilrain was killed on a lonely road, two miles from Panriac, Michigan, at 3:00AM on March 17 of last uear. Otto, Currey, Slim, Mickey and Kid were arrested a week later in Detroit and questioned. Each of the five made four statements, three of which were true and one of which was false. One of these prisoners killed Kilraine. Their statements were

OTTO: I was in Chicago when Kilrain was murdered. I never killed any one. The kid is the guilty one Mickey and I am a pal.

CURLY:I did not kill Kilraine. I never owned a revolver in my life. The kid knows me. I was in Detriot the night of March 17.

SLIM: Curly kited when he said he never owned a revolver. The murer was committed in St, Patrick ‘s Day. Otto was in Chicago at this time. One of us is guilty.

MICKEY: I did not kill Karlian. The kid saw Otto before. Curly was in Detroit with me in the night of March 17.

THE KID: I did not kill Kilrain. I have never been in Pontiac. I never saw Curly before. Otto erred when he said I am guilty.

Who did it?

SOLUTION:

First of all I give numbers to the different statements made by different people.

OTTO:

1) I was in Chicago when Kialraine was murdered. (T)
2) I never killed anyone. (T)
3) The kid is guilty one. (F)
4) Mickey and I are pals. (T)

CURLY:

1) I did not kill Kilraine. (F)
2) I never owned a revolver. (T)
3) The kid knows me. (T)
4) I was in the Detroit that night. (T)

SLIM:

1) Curly lied when he said he never owned a revolver. (F)
2) The murder was committed on St.Patrick’s day. (T)
3) Otto was in Chicago that night.(T)
4) One of us is guilty. (T)

MICKEY:

1) I did not kill Kilraine. (T)
2) The kid has never been in Pontiac. (T)
3) I never saw Otto before. (F)
4) Curly was in Detriot with me on the night of March 17. (T)

THE KID:

1) I did not kill kalrine. (T)
2) I have never been in Pontiac (T)
3) I never saw curly before. (F)
4) Otto erred when he said I am guilty. (Y)

The kid's first and fourth statement is equivalent in meanings and therefore either both true of both false. Since only one statement is false, so they are both true.
Otto's third statement is therefore, false, and so his first, second and fourth statements are true.
Therefore, Mickey's third statement is false and so his first, second and fourth statements are true.
As Mickey's second statement is true, therefore kid's second statement is also true. The kid's third statement is false as his other three statements are true.
As kids third statement is false therefore, Curly's third statement is true.
Curly's fourth statement is true because Mickey's fourth statement is true.
Slims third statement is true because Otto first statement is true.
As March 17 is the St. Patrick's Day so slims second statement is true. Slim's fourth statement is also true because all others except Curly and slims are confirmed to be innocent. As slims second third and fourth statements are true so his first statement is false.
Therefore Curly's second statement is true. And his first statement is false .so he is guilty and he killed the Kilraine.

PROBLEM #8:

A woman recently hosted a politician meeting to which she invited five guests. The name of the six people who sat own at the circular table were Abrams, Banjo, Clives, Dumont, Ekwll and fish. One was of them, was deaf and one was very talkative, one was terribly fat, one simply hated Dumont, one had a vitamin deficiency and one was the hostess.

a) The person who hated Dumont sat directly opposite Banjo.
b) The deaf one sat opposite Clive, who sat between the one who had a vitamin deficiency and who hated Dumont.

c) The fat one sat opposite Abram, next to the deaf and to left of the one who hated Dumont.

d) The person who had vitamin deficiency sat between Clive and the who sat opposite the person who hated Dumont.

e) Fish, who was a good friend of every one sat next to the fat person and opposite the hostess.

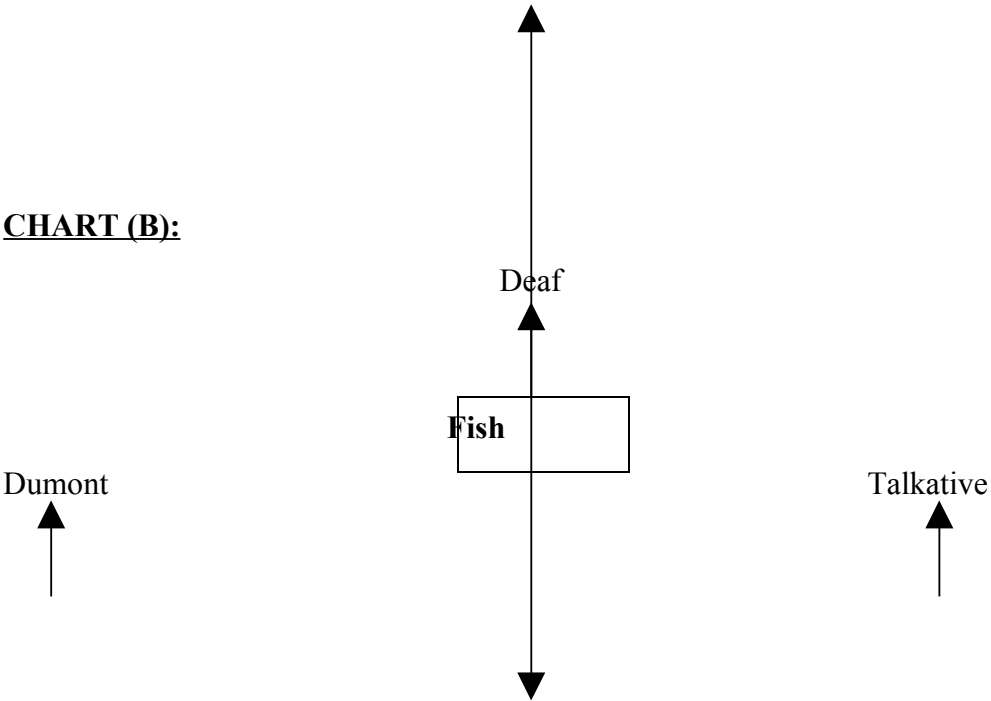
Identify each of these people, matching names and description?

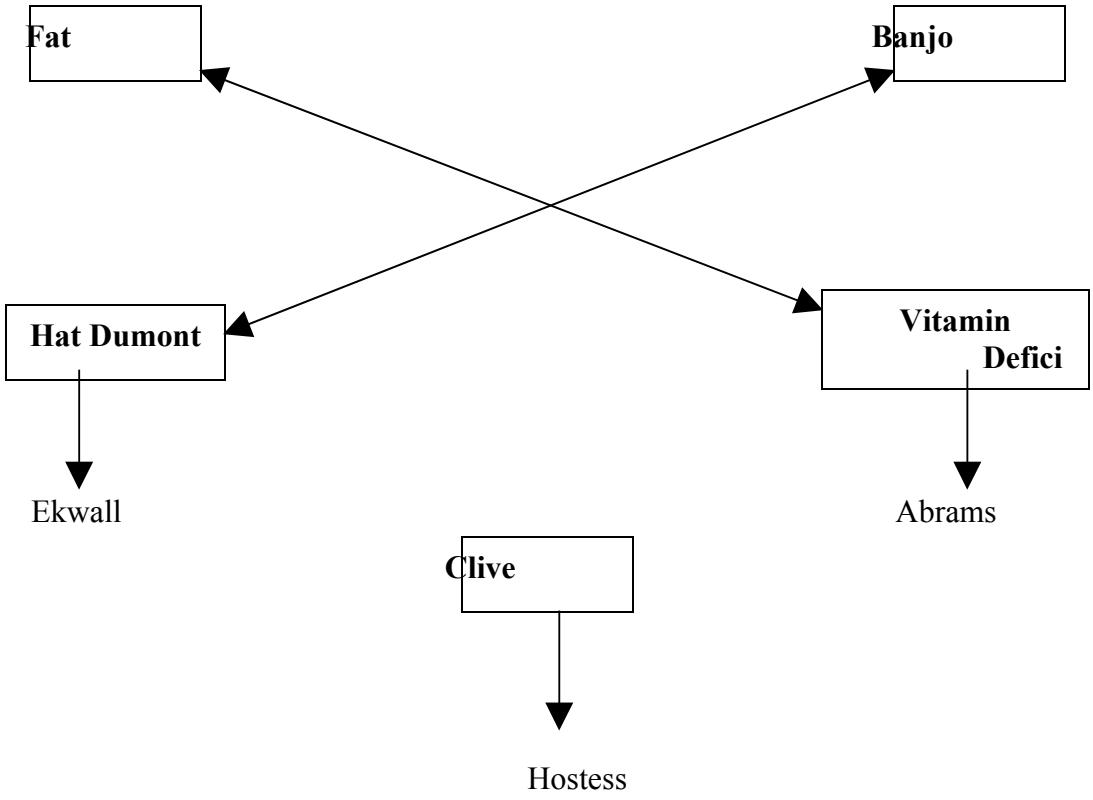
SOLUTION:

X = Cancel Y = OK

	DEAF	TALKITIVE	FAT	ONE WHO HATED DUMONT	ONE HAVING VITAMIN DEFICIENCY	HOSTESS
Abrams	1 X	2 X	3 X	4 X	5 Y	6 X
Banjo	7 X	8 Y	9 X	10 X	11 X	12 X
Clive	13 X	14 X	15 X	16 X	17 X	18 Y
Dumont	19 X	20 X	21 Y	22 X	23 X	24 X
Ekwall	25 X	26 X	27 X	28 Y	29 X	30 X
Fish	31 Y	32 X	33 X	34 X	35 X	36 X

CHART (B):





From (a), Bango does not hat Dumont. As man who hated Dumont is sat opposite to Bango so, cancel 10.

From (b), it is indicated that Clive is not deaf, does not have vitamin deficiency and does not hat Dumont, so cancel 13,16 and 17.

From (c), it shows that Abrams is not fat, deaf and does not hat Dumont. So cancel 1, 3

And 4.

From chart B, unto now, it is proved that Abram has vitamin deficiency. So cancel 2,6,11,17,23,29 and 35.

Since Bango is not fat so, cancel 9.

From (e), it is clear that Fish cannot hat any one so, cancel 34.

As he is not fat nor he is hostess therefore cancel 33 and 36.

Now from chart B, it is proved that Fish is deaf and Clive is hostess. So cancel 32, 7,19 and 25 (For Fish) and 14, 15 ----, 12,24,30 and 36 (For Clive).

Cancel 22 because Dumont cannot hat himself. So it is concluded that Ekwall hats Dumont. So cancel 26, 27. Bango is talkative and Dumont is fat man.

PROBLEM # 9:

Three people went into a hotel and rented a room for $ 30, each paying $10 as his share. Later, the clerk discovered that the price of the room was only $25. He handed the bellman five $1 bills and asked him to return them to the three people. The bellman not knowing how to divide $5 among three people, instead gave each person $1and the rest to charity.

Three people originally paid a total of $27 for the room .Add to that the $2 that the bellman gave away and you have a total expenditure of $29 instead of $30. What happened to the other dolor?

SOLUTION:

The three people paid $30 to the clerk but the original expenditure for rented room received by the clerk was $25. He handed the bellman five $1 bills and asked him to return it to the three people. The bellman not knowing how to divide $5 among three people, instead gave each person $1 and rest to charity.

The three people paid $10 each, but each then received $1 back, so the total expenditure for the room that they actually paid was $ 27 including $ 2that was given to charity by the bellman. This is the point where the writer or problem maker twists the question by asking to add to the $ 27, that $2 that the bell man give away, and you'll then have a total expenditure of $29 instead of $30. But it is not the correct way. Because when he asks to add $2 to $27 rather than adding it. By doing so you'll get the actual amount received by the clerk or paid by them to the clerk.

An other way to explain the twist made by the writer or problem maker in the question is that he subtracts $3 from $30 and gets $27, and then he adds $2 to get the original result of $30. It is the rule of mathematics that whatever you are adding/subtracting, you have to subtract/add the same figure or number to neutralize the effect of that figure. So, how can you get the same result by adding one thing and subtracting another?

Another method to solve the question is that the clerk receives $25 for the room (returns $5). The decision of dollars can be made like this;

As the clerk receives $25 keep $6 on one side and divide the rest $24 by three. It means that each person paid $8 to the clerk. Now add $3 (That were returned to the three people by the bell man) to $24. The result is $27. Add $2 (of charity) we get

$29. Now add that $7 which was kept on one side and the result comes $30. It means that $7 was with the clerk.

PROBLEM#10:

A jeweler has ten diamonds, nine of them exactly the same weight, the tenth slightly different. They are all mixed together and his problem is to select the one that is different and to tell whether it is lighter or heavier than the others. How can he do this by making only three uses of his balance?

SOLUTION:

Number the diamonds 1 to 10, and proceed as follows;
First weight 1,2,3,4,5,6,7,8

A) If they balance:

The odd diamond must be 9 or 10.
Weight 9 against 7. If 9 go up, it is the odd diamond and light. If 9 go down, it is the odd diamond and heavy, if they balance, the odd diamond must be 10. Then weight 10 against 1; if 10 goes up, it is light, if goes down, it is heavy.

B) If do not balance:

Suppose that 1,2,3,4 go down, while 5,6,7,8 go up. Then weight 1,2,8,9 against 3,4,7,10. If 1,2,8,9 go down the odd diamond must be either 1 or 2 and heavy or 7 and light. Then weight 7 against 2; if either goes down, it is the odd diamond and heavy. If they balance, the odd diamond is 7 and light. If, on the second weighing 3,4, 7,10 go down, the odd diamond must be either 3 or 4, and heavy or 8 and light. Weight 3 against 4; if either goes down, it is the odd diamond and heavy; if they balance, the odd diamond is 8 and light.

PROBLEM#11:

Imagine a room with four walls; a nail placed in the center of each wall, as well as in the ceiling and floor, six nails in all. The nails are connected to each nail by a separate string. These nails strings obviously make many triangles, since any three nails may be considered the apexes of a triangle.

Can the colors of the strings be distributed so that no one triangle has all three sides (strings) of the same color? If so, how? And if not, why not?

SOLUTION:

It is not possible to distribute the strings so that no one triangle has all three sides (strings) of the same color.

Consider any one nail, say the one on a wall we call A. From it stretch five strings and of these five at least three must be of the same color, since only two colors (blue and red) are available. Suppose that three of the strings from the nail in the wall A are red, that they go to the other three walls B, C and D. Now consider the triangle formed by the nails on these three other walls B, C and D. They must not all be of the same color, so they cannot all be blue. So at least one of the strings connecting B, C and D is red, it must complete a triangle of three red strings. (Suppose the string connecting B and D is red one. Then there will be a triangle of three red strings connecting A, B and D, etc). No matter which nail we begin with, there is no way to avoid at least one triangle all of whose sides are strings of the same color.

PROBLEM #12:

In a certain bank there are eleven distinct positions namely, in decreasing order (rank), President, First Vice -President, Second Vice President, third Vice President, Cashier, Teller, Assistant Teller, Book Keeper, First Stenographer, Second Stenographer and Janitor. These eleven positions are occupied by the following, listed alphabetically: Mr. Dale, Mr. Evans, Mrs. Brown, Mr. Grant, Miss. Hill, Mr. Jones, Mrs. Kane and Mr. Long. Concerning them, only the following facts are known;

A. The Third Vice President is the pampered grand son of the President and is disliked by both Mrs. Brown and Assistant Teller.
B. The Assistant Teller and the second Stenographer shared equally in their father's estate.
C. The second Vice President and the Assistant Teller wear the same style of hat.
D. Mr. Grant told Miss. Hill to send him a stenographer at once.
E. The President's nearest neighbors are Mrs. Kane, Mr.Grant and Mr. Long.
F. The first Vice President and the cashier live at the exclusive Bachelor's club.
G. The Janitor, a miser, has occupied the same room since boyhood.

H. Mr. Adams and the Second Stenographer are leaders in the social life of the younger unmarried set.

I. The Second Vice President and the Bookkeeper were once engaged to be married to each other.

J. The fashion able Teller is the son-in-law of the First Stenographer.

K. Mr. Jones regularly gives Mr. Evans his discarded clothing to wear., without the elderly Bookkeeper knowing about the gift.

Show how to match correctly the eleven against the eleven positions occupied?

SOLUTION:

	President	1st Vice President	2nd Vice President	3rd Vice President	Cashier	Teller	Assistant Teller	Book Keeper	1st Stenographer	2nd Stenographer	Janitor
	1	2	3	4	5	6	7	8	9	10	11
Mr. Adams	X	X	X	Y	X	X	X	X	X	X	X
	12	13	14	15	16	17	18	19	20	21	22
Mrs. Brown	X	X	X	X	X	X	X	X	Y	X	X
	23	24	25	26	27	28	29	30	31	32	33
Mr. Camp	X	X	X	X	X	X	X	Y	X	X	X
	34	35	36	37	38	39	40	41	42	43	44
Miss. Dale	X	X	X	X	X	X	X	X	X	Y	X
	45	46	47	48	49	50	51	52	53	54	55
Mr. Evans	X	X	X	X	X	X	X	X	X	X	Y
	56	57	58	59	60	61	62	63	64	65	66
Mrs. Ford	Y	X	X	X	X	X	X	X	X	X	X
	67	68	69	70	71	72	73	74	75	76	77
Mr. Grant	X	Y	X	X	X	X	X	X	X	X	X
	78	79	80	81	82	83	84	85	86	87	88
Miss. Hill	X	X	Y	X	X	X	X	X	X	X	X
	89	90	91	92	93	94	95	96	97	98	99
Mr. Jones	X	X	X	X	X	Y	X	X	X	X	X
	100	101	102	103	104	105	106	107	108	109	110
Mrs. Kane	X	X	X	X	X	X	Y	X	X	X	X
	111	112	113	114	115	116	117	118	119	120	121
Mr. Long	X	X	X	X	Y	X	X	X	X	X	X

X = Cancel Y = OK

From (a) it is clear that females cannot be the third Vice President. So cancel 15, 37, 81, 103, 59 and also Mrs. Brown cannot be then President and Assistant Teller so, cancel 12, 18. As Miss. Dale and Miss. Hill are unmarried so, they cannot be President, cancel 34 and 78.

From (d), it is clear that Miss. Hill and Mr. Grant cannot be stenographer. So cancel 75, 76 and 86, 87.From (e), Mrs. Kane, Mr. Grant and Mr. Long cannot be president. So cancel 67, 100 and 111.

From (f), it means that First Vice President and Cashier are men so, cancel 13, 35, 57,79, 101 and 16, 38, 60 82, 104, as they all are females.

From (g), Janitor is a man so; cancel all females for Janitor 22, 44, 66, and 88, 110.

From (h), it is clear that Mr. Adams and second stenographer are unmarried because they are the leaders of the unmarried set and leader of such group can not be married so, cancel 10 for Mr. Adams and 21, 65, 109 as they are married.

From (I), Second Vice President and Book keeper are unmarried so, cancel 14, 58, 102 and 19, 63, 107 as they are married.

From (j), Teller is male so, cancel 17, 39, and 61, 83, 105 as they are females and First Stenographer is married so, cancel 42.

As it is cleared from (h) that Mr. Adam is bachelor so he cannot be Teller and First stenographer and also President because President has grandson. So cancel 6, 9 and 1.

From (k), Mr. Jones and Mr. Evens cannot be Bookkeeper so, cancel 52, 96.

It is know, up to, confirmed that Mrs. Brown is First Stenographer so, cancel 119, 108, 31, 53, 64, 97. After canceling above, we get that Mrs. Kane is Assistant Teller so; cancel 7, 29, 40, 51, 62, 73, 84, 95 and 117.

After this we confirmed Mrs. Ford as President. They're fore cancel 23, 45 and 89.

Now from the chart, we can see that two options are left for Miss. Hill either 2nd Vice President or Bookkeeper and as in (I) we are told that once 2nd Vice President and Bookkeeper were engaged to be married to each other, it means that one of them is male and other is female. While in (c) we are told that Assistant Teller and 2nd Vice President wear the same style of hat and as it is confirmed that Assistant Teller is female (Mrs. Kane) so, 2nd Vice President must be female because no male can wear the same type of hat as female wears. It means that Miss. Hill is then 2nd Vice President and not the Bookkeeper. So cancel 3, 25, 36, 47, 69, 91, 113 and also 85.

As 2nd Vice President is female so, Bookkeeper is then male, cancel 41.

From the chart it is clear that Miss. Dale is 2nd Stenographer as all other boxes are crossed. Then cancel 32, 54, 98, 120.

In (d), Mr. Grant orders Miss. Hill to send him stenographer. As Miss. Hill is 2nd Vice President so, Mrs. Grant must be supervisor .So he is First Vice President. Cancel 2, 24, 46, 90, 112 & 70, 71, 72, 74, 77.
In (k), we are told that Mr. Jones regularly gives Mr. Evans his discarded clothing to wear. It means that Mr. Jones is a fashionable person who regularly used to discard his clothing in order to remain in fashion. So he is a fashionable Teller by (j). So cancel 92, 93, 99 & 28, 50, 116.
From (k) it is clear that Mr. Evans is a miser as he uses discarded clothes of Mr. Jones and in (g) we are told that Janitor is a miser so, Mr. Evans is Janitor. So cancel 48, 49, & 11, 33, 121.

In (e), it is told that Mr. Long and Mr. Grant are President's nearest neighbors and in (f) it is said that First Vice President and the Cashier live at the Bachelor's club and it is confirm that First Vice President is Mr. Grant and as Mr. Long lives near to Mr. Grant so, he must be cashier as cashier lives at the Exclusive Bachelor's Club, near to Mr. Grant. So cancel 114,118 and 5, 27.

In (k), we are told that Bookkeeper is elder than Mr. Jones, who is married and in (h) we are told that Mr. Adams is the leader in the social life of younger unmarried set. So when we compare these two statements (k & h) we come to the conclusion that Mr. Adam is younger and Bookkeeper is elder, so he cannot be the Bookkeeper. Thus he is the third Vice President , cancel 26 & 8. Hence Mr. Camp is then the Bookkeeper.

PROBLEM# 13:

In the same mythical community described in Exercise 1, a stranger meets three other people (natives) and asks them, "How many of you are politicians?" The first native replies, "We are all politicians." The second native says,"No, Just two of us are politicians." The third native then says, " That is not true either."
Is the third native a politician?

SOLUTION:

No the third is not a politician. If the third native was a politician, it means he is telling a lie by saying that "that's not true either". Means the first two natives are telling truth.

But the first two native cannot tell the truth at the same time because one is saying: " We are all politicians" and the second one is saying that: "Just two of us are politician".

So the third native is not telling lie, he is telling the truth and non-politicians always tell the truth.

Third native is non-politician.

(Problem#13) Picture a checkerboard (or chessboard having eight rows and eight columns…)

If so, how? And if not, why not?

SOLUTION:

It is not possible to leave the upper left and the lower eight corners empty. One dominoes is left such that it could not be settled

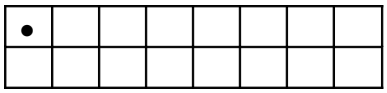
This is because the empty corners are diagonal to each other.

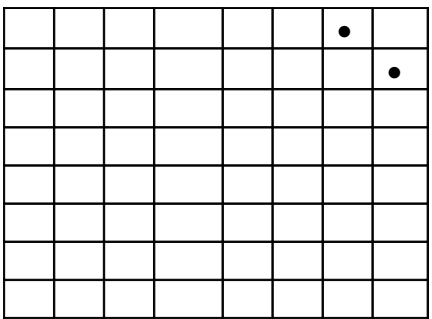
If we rearrange by changing there places i.e. moving the whole board to one side and then up or down. They both comes diagonal to each other and the remaining could not be covered with dominoes filling two.

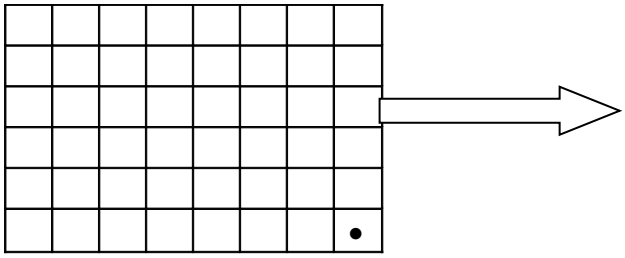
One domino comes diagonal; if we are allowed to place one domino diagonally then it is possible. Otherwise it is not possible.

(● = Empty place)

Draw table







PROBLEM#14:

In the same mythical community described in exercise 1, a stranger……

Is the third native a politician?

SOLUTION:

No, the third is not a politician.

If the third native was a politician, it means he is telling a lie by saying that" it isn't true either" means that the first two natives are telling truth but the first two natives cannot tell the truth at the same time because one is saying "we are all politicians" and the second one is saying that," just two of us are politicians".

So the third native is not telling a lie, he is telling the truth. And the non-politician always tells the truth.

Third native is a non-politician.

PROBLEM#15:

CHALLENGING QUESTION:

You are presented with a set of twelve metal balls, apparently identical in every respect size, color and so on. Infact eleven of them are identical, but one of them is odd it differ from all the rest in weight only it is either heavier or lighter than all the others. You are given a balance scale, on which the balls can be weighted against one another. If the same number of balls are put on each side of the balance and the odd ball is on one side, that side will go down if the odd ball is heavier or up if the odd ball is lighter the two sides will be balanced if the odd ball is not among them. Those weighted and the same numbers of balls are placed on each side. You are allowed three weighing only any removal or additions of a ball constitute a separate weighing.

Your challenge is this, device a set of three weighing that will enable you to identify the odd ball wherever it may lie in a random mixing of the twelve balls and that will enable you to determine whether the odd is heavier or lighter than the rest.

First label the ball i.e. 1, 2, 3, 4, 5, 6, 7, 8, 9 and a, b, c, d.

SOLUTION:

First weight 1, 2, 3, 4 against 5, 6, 7, 8. If balanced then it means that odd ball is among a, b, c, d .now weight a & b against c, 3 or c in combination with any number among 1 to 8 . If they are balanced then the odd ball is d. now add d against any ball among 1 to 8. if d goes up it means it is lighter or if it goes down it is heavier. If a, b-side is heavier then it means that either a or b is odd and heavier or c is odd and light. Now weight a against b. the one which is heavier is odd. If both a and b are balanced then c is odd and light. If a, b side goes up it means that either a or b is odd or c is odd and heavy so weight a against b. the one which goes up is odd and if both are balanced then c is odd and heavy.

Now suppose that weighing 1, 2, 3, 4 against 5, 6, 7, 8 (the first weight) is not balanced it means that odd ball is among them.

Suppose 1, 2, 3, 4 pans go down while 5, 6, 7, 8 goes up it means that the odd ball is among 1 to 8 and a, b, c, d balls are right. Then weight 1, 2, 8, a against 3, 4, 7, b if 1, 2, 8,a goes down the odd ball must be either 1 or 2 and heavy or 7 and light. Then weight 7 and 2. If either goes down it is the odd ball and heavy if they balance the odd ball is 7 and light if in 2^{nd} weighing 3, 4, 7, b go down the odd ball must be 3 or 4 and

heavy or 8 and light then weight 3 against 4 if either goes down it is the odd ball and heavy, if they are balanced the odd ball is 8 and light.