**Question 3**:

**Company:**

**Year:**

What is Bottom up parsing and what is top down parsing?

**Solution 1:**

**Bottom-up** parsing is a strategy for analyzing unknown data relationships that attempts to identify the most fundamental units first, and then to infer higher-order structures from them. It attempts to build trees upward toward the start symbol. It occurs in the analysis of both natural languages and computer languages.

**Top-down** parsing is a strategy of analyzing unknown data relationships by hypothesizing general parse tree structures and then considering whether the known fundamental structures are compatible with the hypothesis. It occurs in the analysis of both natural languages and computer languages. Please refer to these links for much better information.

**4**. What is a symbol table?

**Solution:**

In computer science, a symbol table is a data structure used by a language translator such as a compiler or interpreter, where each identifier in a program's source code is associated with information relating to its declaration or appearance in the source, such as its type, scope level and sometimes its location.

Check out

<http://en.wikipedia.org/wiki/Symbol_table>

**5**.There is a portal with two billion users registered. If you store all the 2 billion users in a conventional databases it will take more time to retrieve the data about a particular user when that user tries to login. How do you handle this situation to make sure that the user gets the response quickly.

**Solution:**

Every row has a primary key. Suppose the primary key for this

particular database is the name of the user then we can sort the names based

on alphabets and do secondary indexing based on the starting alphabet . If

the data is uniformly distributed we can go for multilevel indexing or

hashing.Similarly if we have a registration number as the primary key then

we can sort the table based on registration number and then do indexing

either secondary level or multilevel or apply hashing techniques based on

the distribution of data. Many efficient algorithms are available for

indexing and hashing.

**6**.You have all the English words with you. you would like to manage a dictionary so that you can look up when ever you have doubt. Which data structure would you like to use and why?

**Solution:**

Dozens of different data structures have been proposed for implementing dictionaries including hash tables, skip lists, and balanced/unbalanced binary search trees -- so choosing the right one can be tricky. Depending on the application, it is also a decision that can significantly impact performance. In practice, it is more important to avoid using a bad data structure than to identify the single best option available.As the frequency of look ups for a word is also important,weighted binary search tree with weights in proportion to the frequency of lookups and determining the depth, can be effective.

**7**.Asked me about all the details of hash table and heaps.

**8**..

**9**

**10.**Now given that the n intervals are overlapping then how do you solve? The interviewer was concentrating more on the complexities (running, memory ..)

**Solution:**

If the above intervals are overlapping ,then they can be merged in O(N) and then the exact intervals can be resolved later.Otherwise ,we can identify one correct interval and then linear search on its left and right neighbourhood to find the other solutions.

,

**11.**Write code for Random Sort?

Algorithm is explained:

Given an input array of size n. Random sort is sampling

a new array from the given array and check whether the

sampled array is sorted or not. If sorted return else

sample again. The stress was on the

code.

**12. Why are manhole covers round?**

Manhole covers round, so that man does not fall through the manhole as the plane, or square shape ordinarily flush with the plane of the street goes perpendicular to the street.

**13. Mention how many times a day do a clock’s hands overlap?**

Clock hands overlap about **22 times** a day.

**14.Explain the significance of “dead beef”?**

Usually, people respond this question with an answer like “Beef is always dead” – Wrong Answer. The correct answer is that “DEADBEEF” is a hexa-decimal value that was used in debugging back in the mainframe/assembly days as such it was easy to see when marking and finding specific memory in pages of hex dumps. Most computer engineers are aware of this term.

**15.Tell me what happened when a man pushed his car to the hotel and lost his fortune?**

He landed on the boardwalk- that is the answer

**16. Out of eight balls, seven balls weigh equal while the one ball is slightly heavier than the others how would you figure out which one is the heavier by using a balance and only two weighing?**

* Take 6 balls out of 8 balls
* Put 3 balls on each side of weighing machine, if they weight equal you know that the heavier ball is in the remaining two which is left out
* But if they don’t weigh equal, then the heavier ball is in one of those triplets
* Out of those 3 balls that have heavier ball, pick any 2 and put them on the scale and keep doing until you get your heavier ball

**17. Explain what is database to an eight year old kid?**

A database is a machine that memorizes lot of information about lots of things. People use them to remember that information.

**18. Some months have 30 days, and some have 31, how may months have 28 days?**

Answer to this question is 12 months, as each month has 28 days. So don’t answer 1 or Feb.

**19.20. Suppose Tom is 16 year old, and he is four times older than his brother Robert. How old Tom would be when he is twice as old as her brother?**

If Tom is 16 year old and he is 4 times older than his brother Robert, then currently his brother age would be 16/ 4 = 4. So his brother is 4 year old.

This makes Tom 12 years older than her brother

Now, Tom will be double his brother age when Robert is 12 year old.

i.e 12X2 = 24. Which means when Tom will be 24 year old his brother age will be 12.

**22. What will be the next number 5,10,19,32,49,70 ….?**

The next number will be 95. How? Let see

This time the difference between the adjacent number is calculated like

10-5 = 5

19-10 = 9

32-19=13

49-32= 17

70-49=21

?- 70= 25

For each answer 5, 9, 13 there is a difference or increase of 4, so our next increment will be 25.

So, ? -70 = 25

25+70= 95

**23. There are about 13 caves arranged in a circle, and one of these caves has treasure of Each day the treasure keepers can move the treasure to the adjacent caves or keep it in the same cave. Every two-day treasure keepers visit the place and have enough time to enter any two caves of their choice \_\_ So how do the treasure seekers can find a treasure in minimum possible days?**

Answer: Seven days. If one of the treasure seeker moves clockwise every day and one of the seeker’s moves anti-clock wise, they will find a treasure in minimum seven days.

**24. There are six drinking glasses standing in a row, with first three full of juice and the next three empty? How can you arrange those glasses so empty and full glasses alternate by moving only one glass?**

Pour the second glass in the fifth glass, and you can arrange them in alternate order.

**25. Brother and sisters I have none but this man’s father is my father’s son? Who is the Man?**

The man is my son.

**26. A red house is made of red bricks; a blue house is made up of blue bricks than what does the green house is made up of?**

Green house is made up of Glasses

**27. Explain how five minus two equal 4?**

If you take f and e from five what remain is Roman numeral iv.

**28. The day before the day before yesterday is three days after Saturday. What day is today?**

Answer is Friday. **->** Three days after Sunday is Tuesday, and then the day before yesterday was Wednesday (Tuesday being the day before the day before yesterday), therefore, today is Friday.

**29. Who will be the shortest among all of them?**

1. Roger is as tall as Oliver
2. Binny is shorter than Tony
3. Tony is taller than Oliver
4. Roger is shorter than Binny

Answer: There is no answer, because Roger and Oliver are equally tall.

**30. A trader buys sugar for $1200 and sell it for $1500, per sack of sugar he makes a profit of $50. How many sacks of sugar did he have?**

He might have 6 sacks of sugar,

$1500- $1200 = 300

300/50 = 6

**31. Mention which lamp is brightest than all?**

1. Lamp A is less brightest than Lamp B
2. Lamp B is brighter than Lamp C
3. Lamp C is as bright as Lamp D
4. Lamp B is brighter than Lamp D
5. Lamp D is brighter than Lamp A

The correct answer is B.

**32. How can you get a total of 1000, by adding eight 8?**

888+88+8+8+8=1000

**33. There is a casino and it has 4 gates, let say A, B, C and D. Now the condition is that every time you enter casino you have to pay $5 and every time you leave the casino, you again have to pay $5. Also, whenever you enter the casino whatever amount you have with you will get double. Now you enter the casino through gate A and come out through gate B, again you go inside casino from gate C and come out of gate D, at the end of this process you should be left with no money? So calculate how much money you should carry with you when you enter the Casinp?**

Ok, we have to work out some math’s over-here,

* Let say when you enter a casino you had the amount “”
* When you enter the gate A you spend $5, so the amount becomes (X-5)
* But there is a condition, your amount will get double when you enter the casino and becomes 2(x-5), e., (2X-10)
* Now you leave the casino through gate B, and you pay $5, which makes the amount (2X-15)
* Again you enter a casino through gate C, and you pay $5, so the amount you have now (2x-15) which becomes (2X-20)
* Now you are in the casino; your amount will get double e., 2(2x-20) which is (4x-40)
* At last you are making your final exit through gate D by paying $5, which will make your amount (4x-40-5) e., (4x-45)
* So now the condition is when you finally leave casino you should have 0 amount of money left with you
* For that, we will have equation 4x-45=0, and we solve this to get the answer 11.25
* You should carry the amount of $11.25 inside the casino so that you must not leave with any money at the end

**34. By using number 7,3,7,3 can you get number 24 by using any mathematical signs (+, – , x, /)?**

Answer: 7x ((3/7) +3) = 24

**30) Now we have a committee of 10 members, where age of all 10 members is same as it was 4 years ago, because an old member is replaced by young member? Find out how much younger is the new member?**

* Let say the sum of nine member = X and age of old man = Z
* So its average 4 years before = (x+z)/10
* After 4 years let Z be replaced by Y
* So now avg=(x+4×10+y)/ 10
* Now, (x+z)/10 = (x+40+y)/10
* So in the end you will get z=y+40
* So young committee member is 40 years younger than old member

**31) Find a 8 digit number that if multiplied with 9 or any of its multiples ( 18, 27, 36, 45,…) it will get the multiplication factor repeated (n) number of times like 111111, 22222, 333333 and so on?**

That eight digit number is 12345678

12345678 x 9 = 111111111111

12345678 x 18 = 222222222222

12345678 x 27 = 333333333333 and so on

**32) If you have a piece of paper that have a thickness of 0.1 mm, how many times you have to fold the paper in half to become tall enough to reach the moon?**

With every fold of paper, the thickness of paper gets double, after two folds it will get 2mm thick. In order to reach a height of the moon, you require only 42 folds of paper as it will be cover the distance of 4,39,804 km.

**33) If a car is driving at 100mph down straight road, then what is the speed of each of its wheels at the point where they touch the ground?**

Answer is zero, when the wheel rolls, it is moving in two ways; rotationally around its center and horizontally in the direction of the travel. At its point of contact with the ground, both of these motions cancel each other out, leaving a net speed (with respect to the road) of zero.

**34) An airplane crashed into a field and every single person died except two how come?**

Because they were married and not single.

**35) A man predicts that he can predict the exact score of every foot ball game before it begins, and he is always right, how come?**

Because the score he predicts before the match begin is “ 0-0 ”.

**36.What is null pointer?**

When referring to computer memory, a null pointer is a command used to direct a software program or operating system to an empty location in the computer memory. Commonly, the null pointer is used to denote the end of a memory search or processing event. In computer programming, a null pointer is a pointer that does not point to any object or function.

A nil pointer is a false value. For example, 1 > 2 is a nil statement.

In the programming language C, NULL is an available command that can be used, where nil is an available command used in the Pascal programming language.

**37.What are the 4 basics of OOP?**

Abstraction, Inheritance, Encapsulation, and Polymorphism.

**38.What you mean by Object Relational DBMS?**

An object-relational database (ORD), or object-relational database management system (ORDBMS), is a database management system (DBMS) similar to a relational database, but with an object-oriented database model: objects, classes and inheritance are directly supported in database schemas and in the query language. In addition, just as with proper relational systems, it supports extension of the data model with custom data-types and methods.

**39.Structural difference between bitmap and b-tree index ?**

Btree

It is made of branch nodes and leaf nodes. Branch nodes holds prefix key value along with the link to the leaf node. The leaf node in turn contains the indexed value and rowed.

Bitmap

It simply consists of bits for every single distinct value. It uses a string of bits to quickly locate rows in a table. Used to index low cardinality columns.

**40**.**what is database Schema?**

The formal definition of database schema is a set of formulas (sentences) called integrity constraints imposed on a database.

**41.what are the different levels of database schema?**

Conceptual schema- a map of concepts and their relationships.

Logical schema- a map of entities and their attributes and relations

Physical schema- a particular implementation of a logical schema

Schema object- Oracle database object

**42.what is difference between foreign key and reference key ?**

Reference Key is the primary key that is referenced in the other table (linked via the other tables Foreign Key). Foreign Key is how you link the second table to the primary tables Primary Key (or Reference Key).

**43.Tell me about DSN?**

A Data Source Name (DSN) is the logical name that is used by Open Database Connectivity (ODBC) to refer to the drive and other information that is required to access data. The name is used by Internet Information Services (IIS) for a connection to an ODBC data source, such as a Microsoft SQL Server database.

**44.difference between Clustered index and non clustered index ?**

Clustered Index

Only one per table

Faster to read than non clustered as data is physically stored in index order

Non Clustered Index

Can be used many times per table

Quicker for insert and update operations than a clustered index

**45.What is WPF and WCF?**

WPF/WCF application, need in .NET 3.0 Framework. This application will cover the following concepts:

WCF(Windows Communication Foundation)

The new service orientated attributes

The use of interfaces

The use of callbacks

Asynchronous delegates

Creating the proxy

WPF( Windows Presentation Foundation )

Styles

Templates

Animations

Databinding

Multithreading a WPF application

**46.What is the difference between an EXE and a DLL?**

The term EXE is a shortened version of the word executable as it identifies the file as a program. On the other hand, DLL stands for Dynamic Link Library, which commonly contains functions and procedures that can be used by other programs.

10.Scenarios in which web application should be used and desktop application should be used?

**47.Tell how to check whether a linked list is circular.**

Create two pointers, each set to the start of the list. Update each as follows:

while (pointer1) {

pointer1 = pointer1->next;

pointer2 = pointer2->next; if (pointer2) pointer2=pointer2->next;

if (pointer1 == pointer2) {

print ("circular\n");

}

}

**48.How can u increase the heap size in the memory?**

If heap size set too low then you will get "out of memory" errors. If you set it too high then your system will hang or you will suffer poor performance because parts of the jvm will be swapped in and out of memory. A rule of thumb is that you should not set this parameter larger than about 80% of your free physical memory. On Windows XP machines you can determine your free physical memory from the Performance tab of the Task Manager application.

Boosting the heap size parameter will allow you to read in larger file-based projects. It will also improve the performance of the database back-end since more memory is available for caching.In Java Set the maximum heap size, using the -Xmx command-line option, to a value that allows the application to run with 70% occupancy of the Java heap.The Java heap occupancy often varies over time as the load applied to the application varies. For applications where occupancy varies, set the maximum Java heap size so that there is 70% occupancy at the highest point, and set the minimum heap size, using the -Xms command line option, so that the Java heap is 40% occupied at its lowest memory usage. If these values are set, the Java memory management algortihms can modify the heap size over time according to the application load, while maintaining usage in the optimal area of between 40% and 70% occupancy.

**49.Why is it difficult to store linked list in an array?**

Both Arrays and Linked List can be used to store linear data of similar types.

Linked list provide dynamic size while the size of array is fixed, So we must know the upper limit on the number of elements in advance.

Linked lists have following drawbacks:

1) Random access is not allowed. We have to access elements sequentially starting from the first node. So we cannot do binary search with linked lists.

2) Extra memory space for a pointer is required with each element of the list.

3) Arrays have better cache locality that can make a pretty big difference in performance.

50**.what is the difference between socket and session?**

The Socket is a Combination of Ip address and Port Number (in pairs)

Session is a Logical Connectivity between the source and destination

51. Write the code for finding the min of n number.

I gave: source- blogspot.in company-google year-2012

for(i=0;i<n;i++)

{

if( a[i]<min )

{ min = a[i] ---- eq(i)

}

}

Given that n numbers are from random sampling how many times (probability) does the line (i) be executed

**Solution:**

min=a[0];

for(i=1;i<n;i++)

{

if( a[i]<min )

{

min = a[i]; -------eq(i)

}

Once the variable min is initialized,the probability of a[i] < min is 1/2. So the expected number of occurances of equation i is (n-1)/2 .

52.Write code for finding number of zeros in n!

Source -blogspot.in year-2012 company-google

**Solution:**A zero in n! typically occurs when a multiple of 5 gets multiplied to an even number.We use this simple yet effective information to solve this problem.In the first n natural numbers,those divisible by 5 are always less than the no of even numbers.So it all boils down to the power of 5 in the prime factorization of n! This simple formula works for finding it floor(n/5)+floor(n/25)+floor(n/125)+......

function zeros(int n)

{

int count=0,k=5;

while(n>=k)

{

count+=n/k;

k\*=5;

}

return count;

}

this count is the number of o's in n!.

53.Reverse a Linked-list. Write code in C.

Source-quora.com year- 2013 company-google

solution-There are multiple ways to go about this. Let’s first look at a recursive solution.

Node \* reverse( Node \* ptr , Node \* previous)  
{  
 Node \* temp;  
 if(ptr->next == NULL) {  
 ptr->next = previous;  
 return ptr;  
 } else {  
 temp = reverse(ptr->next, ptr);  
 ptr->next = previous;  
 return temp;  
 }  
}  
Reversed Head = reverse(head, NULL);

Now for a non-recursive solution.

Node \* reverse( Node \* ptr )  
{  
 Node \* temp;  
 Node \* previous = NULL;  
 while(ptr != NULL) {  
 temp = ptr->next

ptr->next = previous;  
 previous = ptr;

ptr = temp;  
 }  
 return previous;  
}

54. You have two identical eggs. Standing in front of a 100 floor building, you wonder what is the maximum number of floors from which the egg can be dropped without breaking it. What is the minimum number of tries needed to find out the solution?

Source- guru99.com year- 2017 company - microsoft

**Answer:** The easiest way to do this would be to start from the first floor and drop the egg. If it doesn’t break, move on to the next floor. If it does break, then we know the maximum floor the egg will survive is 0. If we continue this process, we will easily find out the maximum floors the egg will survive with just one egg. So the maximum number of tries is 100 that is when the egg survives even at the 100th floor.

Can we do better? Of course we can. Let’s start at the second floor. If the egg breaks, then we can use the second egg to go back to the first floor and try again. If it does not break, then we can go ahead and try on the 4th floor (in multiples of 2). If it ever breaks, say at floor x, then we know it survived floor x-2. That leaves us with just floor x-1 to try with the second egg. So what is the maximum number of tries possible? It occurs when the egg survives 98 or 99 floors. It will take 50 tries to reach floor 100 and one more egg to try on the 99th floor so the total is 51 tries. Wow, that is almost half of what we had last time.

Can we do even better? Yes we can (Bob, the builder). What if we try at intervals of 3? Applying the same logic as the previous case, we need a max of 35 tries to find out the information (33 tries to reach 99th floor and 2 more on 97th and 98th floor).

**Interval – Maximum tries**

1 – 100

2 – 51

3 – 35

4 – 29

5 – 25

6 – 21

7 – 20

8 – 19

9 – 19

10 – 19

11 – 19

12 – 19

13 – 19

14 – 20

15 – 20

16 – 21

55. Two old friends, Jack and Bill, meet after a long time.

Source-mytecinterview.com year-2013 company google

**Jack:** Hey, how are you man?

**Bill:** Not bad, got married and I have three kids now.

**Jack:** That’s awesome. How old are they?

**Bill:** The product of their ages is 72 and the sum of their ages is the same as your birth date.

**Jack:** Cool… But I still don’t know.

**Bill:** My eldest kid just started taking piano lessons.

**Jack:** Oh now I get it.

How old are Bill’s kids?

**Answer:** Let’s break it down. The product of their ages is 72. So what are the possible choices?

2, 2, 18 – sum(2, 2, 18) = 22

2, 4, 9 – sum(2, 4, 9) = 15

2, 6, 6 – sum(2, 6, 6) = 14

2, 3, 12 – sum(2, 3, 12) = 17

3, 4, 6 – sum(3, 4, 6) = 13

3, 3, 8 – sum(3, 3, 8 ) = 14

1, 8, 9 – sum(1,8,9) = 18

1, 3, 24 – sum(1, 3, 24) = 28

1, 4, 18 – sum(1, 4, 18) = 23

1, 2, 36 – sum(1, 2, 36) = 39

1, 6, 12 – sum(1, 6, 12) = 19

The sum of their ages is the same as your birth date. That could be anything from 1 to 31 but the fact that Jack was unable to find out the ages, it means there are two or more combinations with the same sum. From the choices above, only two of them are possible now.

2, 6, 6 – sum(2, 6, 6) = 14

3, 3, 8 – sum(3, 3, 8 ) = 14

Since the eldest kid is taking piano lessons, we can eliminate combination 1 since there are two eldest ones. The answer is **3, 3 and 8**.

56. In a X,s and 0,s game (i.e. TIC TAC TOE) if you write a program for this give a fast way to generate the moves by the computer. I mean this should be the fastest way possible.

Source-yuvajobs.com year-2012 company-microsoft

solution-The answer is that you need to store all possible configurations of the board and the move that is associated with that. Then it boils down to just accessing the right element and getting the corresponding move for it. Do some analysis and do some more optimization in storage since otherwise it becomes infeasible to get the required storage in a DOS machine.I was given two lines of assembly code which found the absolute value of a number stored in twocomplement form. I had to recognize what the code was doing. Pretty simple if you know some assembly and some fundas on number representation

57.**:** Given a linked list containing 0s,1s or 2s. Sort it.

Source - guru99.com year- company - microsoft

sol-// C Program to sort a linked list 0s, 1s or 2s

#include<stdio.h>

#include<stdlib.h>

/\* Link list node \*/

struct Node

{

int data;

struct Node\* next;

};

// Function to sort a linked list of 0s, 1s and 2s

void sortList(struct Node \*head)

{

int count[3] = {0, 0, 0}; // Initialize count of '0', '1' and '2' as 0

struct Node \*ptr = head;

/\* count total number of '0', '1' and '2'

\* count[0] will store total number of '0's

\* count[1] will store total number of '1's

\* count[2] will store total number of '2's \*/

while (ptr != NULL)

{

count[ptr->data] += 1;

ptr = ptr->next;

}

int i = 0;

ptr = head;

/\* Let say count[0] = n1, count[1] = n2 and count[2] = n3

\* now start traversing list from head node,

\* 1) fill the list with 0, till n1 > 0

\* 2) fill the list with 1, till n2 > 0

\* 3) fill the list with 2, till n3 > 0 \*/

while (ptr != NULL)

{

if (count[i] == 0)

++i;

else

{

ptr->data = i;

--count[i];

ptr = ptr->next;

}

}

}

/\* Function to push a node \*/

void push (struct Node\*\* head\_ref, int new\_data)

{

/\* allocate node \*/

struct Node\* new\_node =

(struct Node\*) malloc(sizeof(struct Node));

/\* put in the data \*/

new\_node->data = new\_data;

/\* link the old list off the new node \*/

new\_node->next = (\*head\_ref);

/\* move the head to point to the new node \*/

(\*head\_ref) = new\_node;

}

/\* Function to print linked list \*/

void printList(struct Node \*node)

{

while (node != NULL)

{

printf("%d ", node->data);

node = node->next;

}

printf("n");

}

/\* Drier program to test above function\*/

int main(void)

{ struct Node \*head = NULL;

push(&head, 0);

push(&head, 1);

push(&head, 0);

push(&head, 2);

push(&head, 1);

push(&head, 1);

push(&head, 2);

push(&head, 1);

push(&head, 2);

printf("Linked List Before Sortingn");

printList(head);

sortList(head);

printf("Linked List After Sortingn")

printList(head);

return 0;

}

58. **On my way to California, I saw a man with 5 wives. Each wife had 5 bag. Each bag had 5 cats. Each cat had 5 kittens. Kitten, cats, bags, wives. How many were going to California**

**Ans- Only 1 was going to California, Me. It was not stated whether the man with his wives and pets were going in the same direction.**

**Another answer could be Minimum 1. As it was not stated where the wives, kittens and cats were heOnly 1 was going to California, Me. It was not stated whether the man with his wives and pets were going in the same direction.**

**59. What is the next number in this series? 4, 6, 12, 18, 30, 42, 60, ?**

**sol-4 is in the middle of 3 and 5, 6 is in the middle of 5 and 7, 12 is in the middle of 11 and 13, 18 is in the middle of 17 and 19, 30 is in the middle of 29 and 31. 42 is in the middle of 41 and 43, 60 is in the middle of 59 and 61.**

**Therefore, the next number would be the one that is in the middle of the next two prime numbers, which is 72 (which is inthe middle of 71 and 73).**

**60.Is it advisable to install separate Firewall software in Windows?**

**Sol- Windows already has a built in Firewall software. Installing another firewall software can lead to program conflicts and would open loopholes in security.**

**61. What files are important in a bootable Windows XP operating system?**

**Sol- There are four important files in order to make a bootable Windows XP operating system. These are Ntldr, Ntdetect, Boot.ini and Ntfs.sys.**

**62. If a bear walks one mile south, turns left and walks one mile to the east and then turns left again and walks one mile north and arrives at its original position, what is the color of the bear?**

**Sol- The color of the bear must be White. The reason for this is that the only place where you can end up on the original position after taking those turns and one mile travel is if you’re on one of the Earth’s pole. Incidentally, only polar bears lived on these regions, and polar bears are white colored.**

**63-In Windows XP, what does the letter XP stand for?**

**Sol- The letters XP actually stands for eXPerience. It was designed as an enhancement of Windows 2000, with a totally different and more attractive user interface/console.**

**64.Give some known Windows version and its codename?**

**Sol- Windows 98 – Memphis**

**Windows Me – Millenium**

**Windows XP – Whistler**

**Windows Vista – Longhorn**

**Windows 7 – Vienna and Blackcomb**

**65-100 prisoners are stuck in the prison in solitary cells. The warden of the prison got bored one day and offered them a challenge. He will put one prisoner per day, selected at random (a prisoner can be selected more than once), into a special room with a light bulb and a switch which controls the bulb. No other prisoners can see or control the light bulb. The prisoner in the special room can either turn on the bulb, turn off the bulb or do nothing. On any day, the prisoners can stop this process and say “Every prisoner has been in the special room at least once”. If that happens to be true, all the prisoners will be set free. If it is false, then all the prisoners will be executed. The prisoners are given some time to discuss and figure out a solution. How do they ensure they all go free?**

**Source-mytecinterview.com year- company- microsoft**

**Ans-Since this is the only way they will EVER get out of that prison, they decide to work together and make a plan. They select one prisoner (Bob, easier to refer) as the counter.**

**Every time any prisoner is selected other than Bob, they follow these steps. If they have never turned on the light bulb before and the light bulb is off, they turn it on. If not, they don’t do anything (simple as that). Now if Bob is selected and the light bulb is already on, he adds one to his count and turns off the bulb. If the bulb is off, he just sits there meditates or whatever he wants to. The day his count reaches 99, he calls the warden and tells him “Every prisoner has been in the special room at least once”.**

**So how does this solution work? Every time a prisoner enters the room first, he turns on the bulb if it is off. This way every prisoner turns on the bulb only once. When Bob enters and sees the bulb on, he knows that one new prisoner has entered the room so he adds one to his count. So when his counter reaches 99, he knows the rest of them have all been in the special room and obviously, he has been in the special.**

**66- How many times a day do the minute and hour hands of a clock overlap?**

**Source-mytecinterview year- company google**

**Ans-answer was 24 times? Well if you did, it’s time you think again. Let’s do some math.**

**In T hours, the minute hand completes T laps. In the same amount of time, the hour hand completes T/12 laps.**

**The first time the minute and hour hands overlap, the minute hand would have completed 1 lap more than the hour hand. So we have T = T/12 + 1. This implies that the first overlap happens after T = 12/11 hours (~1:05 am). Similarly, the second time they overlap, the minute hand would have completed two more laps than the hour hand. So for N overlaps, we have T = T/12 + N.**

**Since we have 24 hours in a day, we can solve the above equation for N**

**67-Three ants are sitting at the three corners of an equilateral triangle. Each ant starts randomly picks a direction and starts to move along the edge of the triangle. What is the probability that none of the ants collide?**

**Source - mytecinterview year- company-google**

**Ans-Answer: So let’s think this through. The ants can only avoid a collision if they all decide to move in the same direction (either clockwise or anti-clockwise). If the ants do not pick the same direction, there will definitely be a collision. Each ant has the option to either move clockwise or anti-clockwise. There is a one in two chance that an ant decides to pick a particular direction. Using simple probability calculations, we can determine the probability of no collision.**

**P(No collision) = P(All ants go in a clockwise direction) + P( All ants go in an anti-clockwise direction) = 0.5 \* 0.5 \* 0.5 + 0.5 \* 0.5 \* 0.5 = 0.25**

**68- If you had an infinite supply of water and a 5 quart and 3 quart pails, how would you measure exactly 4 quarts? and What is the least number of steps you need?**

**Sol- This question is very simple actually. Since we can’t hold 4 quarts in the 3 quart pail, we have to look to filling up the 5 quart pail with exactly 4 quarts. Lets count the steps as we move along**

**1. Fill 3 quart pail ( 5p – 0, 3p – 3)**

**2. Transfer to 5 quart pail (5p – 3, 3p – 0**

**3. Fill 3 quart pail ( 5p – 3, 3p – 3)**

**4. Transfer to 5 quart pail (5p – 5, 3p – 1)**

**5. Empty 5 quart pail (5p – 0, 3p – 1)**

**6. Transfer to 5 quart pail (5p – 1, 3p – 0)**

**69-: : You’ve got someone working for you for seven days and a gold bar to pay them. You must pay the worker for their work at the end of every day. If you are only allowed to make two breaks in the gold bar, how do you pay your worker? (Assuming equal amount of work is done during each day thus requiring equal amount of pay for each day)?**

**Source- mytecinterview year- company-google**

**Sol- The trick is not to try and how to cut in such a way to make 7 equal pieces but rather to make transactions with the worker. Make two cuts on the gold bar such that you have the following sizes of bars.**

**1/7, 2/7 and 4/7. For convenience sake, I would just refer to the bars as 1, 2 and 4.**

**At the end of Day 1: Give Bar 1 (You- 2 and 4, Worker- 1)**

**At the end of Day 2: Give Bar 2, Take back Bar 1 (You- 1 and 4, Worker- 2)**

**At the end of Day 3: Give Bar 1 (You- 4, Worker- 1 and 2)**

**At the end of Day 4: Give Bar 4, Take back Bar 1 and Bar 2 (You- 1 and 2, Worker- 4)**

**At the end of Day 5: Give Bar 1 (You- 2, Worker- 1 and 4)At the end of Day 6: Give Bar 2, Take back Bar 1 (You- 1, Worker- 2 and 4)At the end of Day 7: Give Bar 1 (You- Empty, Worker- 1, 2 and 4)**

**70-Four people need to cross a rickety bridge at night. Unfortunately, they have only one torch and the bridge is too dangerous to cross without one. The bridge is only strong enough to support two people at a time. Not all people take the same time to cross the bridge. Times for each person: 1 min, 2 mins, 7 mins and 10 mins. What is the shortest time needed for all four of them to cross the bridge?**

**Source- mytecinterview year- 2009 company- microsoft**

**Sol- The initial solution most people will think of is to use the fastest person as an usher to guide everyone across. How long would that take? 10 + 1 + 7 + 1 + 2 = 21 mins. Is that it? No. That would make this question too simple even as a warm up question.**

**Let’s brainstorm a little further. To reduce the amount of time, we should find a way for 10 and 7 to go together. If they cross together, then we need one of them to come back to get the others. That would not be ideal. How do we get around that? Maybe we can have 1 waiting on the other side to bring the torch back. Ahaa, we are getting closer. The fastest way to get 1 across and be back is to use 2 to usher 1 across. So let’s put all this together.**

**1 and 2 go cross**

**2 comes back**

**7 and 10 go across**

**1 comes back**

**1 and 2 go across (done)**

**Total time = 2 + 2 + 10 + 1 + 2 = 17 mins**

**71-On Bagshot Island, there is an airport. The airport is the homebase of an unlimited number of identical airplanes. Each airplane has a fuel capacity to allow it to fly exactly 1/2 way around the world, along a great circle. The planes have the ability to refuel in flight without loss of speed or spillage of fuel. Though the fuel is unlimited, the island is the only source of fuel.**

**What is the fewest number of aircraft necessary to get one plane all the way around the world assuming that all of the aircraft must return safely to the airport? How did you get to your answer?**

**Source-tecinterviewpuzzel.com year-24 apr 2010 company - microsoft**

**Notes:**

**(a) Each airplane must depart and return to the same airport, and that is the only airport they can land and refuel on ground.**

**(b) Each airplane must have enough fuel to return to airport.**

**(c) The time and fuel consumption of refueling can be ignored. (so we can also assume that one airplane can refuel more than one airplanes in air at the same time.)**

**(d) The amount of fuel airplanes carrying can be zero as long as the other airplane is refueling these airplanes. What is the fewest number of airplanes and number of tanks of fuel needed to accomplish this work? (we only need airplane to go around the world)**

**Sol- As per the puzzle given ablove The fewest number of aircraft is 3! Imagine 3 aircraft (A, B and C). A is going to fly round the world. All three aircraft start at the same time in the same direction. After 1/6 of the circumference, B passes 1/3 of its fuel to C and returns home, where it is refuelled and starts immediately again to follow A and C.**

**C continues to fly alongside A until they are 1/4 of the distance around the world. At this point C completely fills the tank of A which is now able to fly to a point 3/4 of the way around the world. C has now only 1/3 of its full fuel capacity left, not enough to get back to the home base. But the first "auxiliary" aircraft reaches it in time in order to refuel it, and both "auxiliary" aircraft are the able to return safely to the home base.**

**Now in the same manner as before both B and C fully refuelled fly towards A. Again B refuels C and returns home to be refuelled. C reaches A at the point where it has flown 3/4 around the world. All 3 aircraft can safely return to the home base, if the refuelling process is applied analogously as for the first phase of the flight.**

**72-The puzzle is there are 25 horses among which you need to find out the fastest 3 horses. You can conduct race among at most 5 horses to find out their relative speed. At no point you can find out the actual speed of the horse in a race. Find out how many races are required to get the top 3 horses.**

**Source - tecinterviewpuzzel.com year-24 apr 2010 company- google**

**sol-**

**Seven.**

**The first 5 to find the 3 fastest in each group and the sixth with the winners of each group.Now we know the fastest horse.**

**The second fastest horse must either be the second fastest in the sixth race or the second fastest horse in the final winners first race.**

**In the first case, the third fastest horse can either be the third fastest horse in the sixth race or the second fastest horse in either the fastest or second fastest horses first race.**

**Otherwise the third fastest horse could either be the second fastest horse in the sixth race or the third fastest horse in the final winners first race.**

**This makes for a total of five horses for the seventh, and final, race.**

**73-How many points are there on the globe where, by walking one mile south, then one mile east and then one mile north, you would reach the place where you started?**

**Source- tecinterviewpuzzel.com year- 2007 company -infosys**

**Sol- The trivial answer to this question is one point, namely, the North Pole. But if you think that answer should suffice, you might want to think again!**

**Let’s think this through methodically. If we consider the southern hemisphere, there is a ring near the South Pole that has a circumference of one mile. So what if we were standing at any point one mile north of this ring? If we walked one mile south, we would be on the ring. Then one mile east would bring us back to same point on the ring (since it’s circumference is one mile). One mile north from that point would bring us back to the point were we started from. If we count, there would be an infinite number of points north of this one mile ring.**

**So what’s our running total of possible points? We have 1 + infinite points. But we’re not done yet!**

**Consider a ring that is half a mile in circumference near the South Pole. Walking a mile along this ring would cause us to circle twice, but still bring us to back to the point we started from. As a result, starting from a point that is one mile north of a half mile ring would also be valid. Similarly, for any positive integer n, there is a circle with radius**

**r = 1 / (2 \* pi \* n)**

**centered at the South Pole. Walking one mile along these rings would cause us to circle n times and return to the same point as we started. There are infinite possible values for n. Furthermore, there are infinite ways of determining a starting point that is one mile north of these n rings, thus giving us (infinity \* infinity) possible points that satisfy the required condition.**

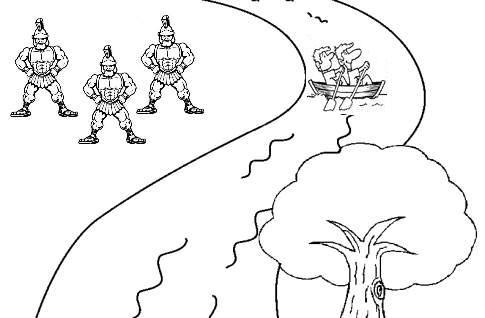
**So the real answer to this question is 1 + infinity \* infinity = infinite possible points!**

**74- An honest man holds a card with one of the three possible numbers on it “1”, “2” or “3”. You can ask one question and the man allowed to answer only “Yes”,”No” and “I don’t know”. The honest man obviously never lies. Which question would you ask to say with 100% certainty which number is on the card the honest man holds?**

**sol-an's number 3 -> Sqrt(3-2)=Sqrt(1)=1, (1>0)==TRUE, so the answer is "YES"**

**Man's number 2 -> Sqrt(2-2)=Sqrt(0)=0, (0>0)==FALSE, so the answer is "NO"**

**Man's number 1 -> Sqrt(1-2)=Sqrt(-1)=i, (i>0)==???, so the answer is "I**

**DON't KNOW"\\mple puzzle. Try to solve this puzzle.**

**75- Consider there are 10 soldiers on the one side of the river. They need to go to the over side of the rever. There is no bridge in the rever and no one can swin in the rever. One of the soldiers spots the boat with two boys inside. The boat is very small and the boys in the boats also very small. The boat can either hold two boys or one soldier. Now tell me how can all soldiers go to the other side of the river using this boat ?**

**source-tecinterviewpuzzel.com year-2009 company -microsoft**

**Answer : First you have the two boys take the boat to one side of the river and leave a boy on that side of the river. One boy takes the boat back to the other side and stands on the shore. Then a soldier gets in the boat and rides it to the other side. When he arrives on the other side, then the boy gets in the boat and takes it back to the other side and picks up the other boy. They ride back to the other shore and drop off one of the boys and continue this process until all the soldiers are on the other side of the river.**

**76-How it is possible to place four points that are equidistance from each other?**

**Source-guruinterview.com year- 2013 company- microsoft**

**Sol- place points in the shape of a pyramid.**

**77- The puzzle is if the shopkeeper can only place the weights in one side of the common balance. For example if shopkeeper has weights 1 and 3 then he can measure 1, 3 and 4 only. Now the question is how many minimum weights and names the weights you will need to measure all weights from 1 to 1000. This is a fairly simple problem and very easy to prove also**

**Source- tecinterviewpuzzel.com year-2013 Company-google**

**Sol- This is simply the numbers 2^0,2^1,2^2 ... that is 1,2,4,8,16... So for making 1000 kg we need up to 1, 2, 4, 8, 16, 32, 64, 128, and 512.**

**78-A man walks into a bar, orders a drink, and starts chatting with the bartender. After a while, he learns that the bartender has three children. "How old are your children?" he asks. "Well," replies the bartender, "the product of their ages is 72." The man thinks for a moment and then says, "that's not enough information." "All right," continues the bartender, "if you go outside and look at the building number posted over the door to the bar, you'll see the sum of the ages." The man steps outside, and after a few moments he reenters and declares, "Still not enough!" The bartender smiles and says, "My youngest just loves strawberry ice cream." How old are the children? A variant of the problem is for the sum of the ages to be 13 and the product of the ages to be the number posted over the door. In this case, it is the oldest that loves ice cream. Then how old are they?**

**Source- tecinterviewpuzzel.com year-2013 company - microsoft**

**Sol- First, determine all the ways that three ages can multiply together to get 72:**

**72 1 1 (quite a feat for the bartender)**

**36 2 1**

**24 3 1**

**18 4 1**

**18 2 2**

**12 6 1**

**12 3 2**

**9 4 2**

**9 8 1**

**8 3 3**

**6 6 2**

**6 4 3**

**As the man says, that's not enough information; there are many possibilities. So the bartender tells him where to find the sum of the ages--the man now knows the sum even though we don't. Yet he still insists that there isn't enough info. This must mean that there are two permutations with the same sum; otherwise the man could have easily deduced the ages.**

**Source- tecinterviewpuzzel.com year-2010**

**The only pair of permutations with the same sum are 8 3 3 and 6 6 2, which both add up to 14 (the bar's address). Now the bartender mentions his "youngest"--telling us that there is one child who is younger than the other two. This is impossible with 8 3 3--there are two 3 year olds. Therefore the ages of the children are 6, 6, and 2.**

**Pedants have objected that the problem is insoluble because there could be a youngest between two three year olds (even twins are not born exactly at the same time). However, the word "age" is frequently used to denote the number of years since birth. For example, I am the same age as my wife, even though technically she is a few months older than I am. And using the word "youngest" to mean "of lesser age" is also in keeping with common parlance. So I think the solution is fine as stated.**

**In the sum-13 variant, the possibilities are:**

**11 1 1**

**10 2 1**

**9 3 1**

**9 2 2**

**8 4 1**

**8 3 2**

**7 5 1**

**7 4 2**

**7 3 3**

**6 6 1**

**6 5 2**

**6 4 3**

**The two that remain are 9 2 2 and 6 6 1 (both products equal 36). The final bit of info (oldest child) indicates that there is only one child with the highest age. This cancels out the 6 6 1 combination, leaving the childern with ages of 9, 2, and 2.**

**79-How many report formats are available in Excel and what are their names?**

**Source- blogspot.in year-2009 company- microsoft**

**Sol- In Excel, we have three formats available:**

**Compact**

**Report**

**Tabular**

**80- How can you format a cell? What are the options?**

**Sol- We can format a cell by using the “Format Cells” option and there are 6 options:-**

**1) Number**

**2) Alignment**

**3) Font**

**4) Border**

**5) Fill**

**6) Protection**

**81-Fill in the missing code:**

**def print\_directory\_contents(sPath):**

**"""**

**This function takes the name of a directory**

**and prints out the paths files within that**

**directory as well as any files contained in**

**contained directories.**

**This function is similar to os.walk. Please don't**

**use os.walk in your answer. We are interested in your**

**ability to work with nested structures.**

**"""**

**fill\_this\_in**

**Sol- def print\_directory\_contents(sPath):**

**import os**

**for sChild in os.listdir(sPath):**

**sChildPath = os.path.join(sPath,sChild)**

**if os.path.isdir(sChildPath):**

**print\_directory\_contents(sChildPath)**

**else:**

**print(sChildPath)**

**82- Write output of the program?**

**int i=10;**

**printf("%d%d%d",i,++i,i++);**

**Sol- 10 12 12**

**83-what is virtual function and pure virtual function?**

**Source allindiajobsinterview.com company - infosys**

**Sol-Virtual function:-To achieve polymorphism, function in base class is declared as virtual , By declare virtual we make base class pointer to execute function of any derived class depends on content of pointer (any derived class address).**

**Pure Virtual Function :-This is function used in base class, and its defination has to be provide in derived class, In other pure virtual function has not defination in base it defined as :**

**virtual void fun()=0;**

**This means that this function not going to do anything, In case of pure virtual funtion derived function has to**

**implement pure virtual function or redeclare it as pure virtual function.**

**84-Write a program to swap two numbers without using a temporary variable.**

**Sol- void swap(int &i, int &j)**

**{**

**i=i+j;**

**j=i-j;**

**i=i-j;**

**}**

**85-What is a default gateway?**

**sol-In organizational systems a gateway is a node that routes the traffic from a workstation to another network segment. The default gateway commonly connects the internal networks and the outside network (Internet). In such a situation, the gateway node could also act as a proxy server and a firewall. The gateway is also associated with both a router, which uses headers and forwarding tables to determine where packets are sent, and a switch, which provides the actual path for the packet in and out of the gateway.**

**86-Given an array of 1s and 0s arrange the 1s together and 0s together in a single scan of the array. Optimize the boundary conditions.**

**sol-void main()**

**{**

**int A[10]={'0','1','0','1','0','0','0','1','0','1','0','0'};**

**int x=0,y=A.length-1;**

**while(x if(!A[x])**

**x++;**

**else if(A[y])**

**y--;**

**if(A[x] && !A[y])//here we are checking that stating index is having 1 and last index having 0 than swap values**

**A[x]=0,A[y]=1;**

**}**

**getch()**

**}**

**87-Describe C standards?**

**Sol- The C standard library or libc is the standard library for the C programming language, as specified in the ANSI C standard. It was developed at the same time as the C library POSIX specification, which is a superset of it.**

**88-What is printf()?**

**Sol- printf() function in C language: In C programming language, printf() function is used to print the “character, string, float, integer, octal and hexadecimal values” onto the output screen. We use printf() function with %d format specifier to display the value of an integer variable.**

**89-Define Joins?**

**Sol- An SQL join clause combines columns from one or more tables in a relational database. ... A JOIN is a means for combining columns from one (self-join) or more tables by using values common to each**

**90-What is compiler?**

**sol-A compiler is a program that translates the source code for another program from a programing language into executable code. The source code is typically in a high-level programming language (e. g. Pascal, C, C++, Java, Perl, C#, etc.). ... As to how a compiler works, that is indeed complicated**

**91-There r 2 pumpkins, same quality but different sizes.Bigger one is 60 cm in circumference and other one is 50 cm in circumference.Bigger one is one and half times more expensive. Which is the better option?**

**Source- geekinterview.com year-2006 company-infosys**

**Sol- The answer will be bigger one, because its price is half of the smaller one.**

**in the case of suppose a person nedeed two 50 kg pumkins, that time if he get shorer one he have to pay rs 50 ,if the price is rs 1 per kilo. so u will take bigger one and he will pay rs 30.**

**92-2 batsman are on 94. 2 balls remaining and 7 runs to win. both batsman make 100 & win the match.**

**Source- geekinterview.com year-2006 company-infosys**

**Sol-one batsman hit the ball and going for single and because of continious over throw he got 6 runs and got out while going for 7. so he is out for 100. the team need one run to win.**

**the new batsman come in at the non striker end and the other batsman hit 6 and get the hundred.**

**93-we have two buckets, 1 of capacity 3liter and another of 5 liter.we have 5 liters of water.so how will we make combinations such that 1 bucket will have exactly 4 liters of water?**

**Source-greekinterview.com year- 2007 company infosys**

**Sol- First pour 5 liter of water in 3 liter container .... now you will have 2 liter remaning in 5 liter...now empty the 3 liter and fill it with 2 liter from the 5 lit container..... now take 5 liter and pour one more liter to 3 liter container ...now you are left with 4 liter in 5 liter container**

**5 3**

**5 0**

**2 3**

**2 0**

**0 2**

**5 2**

**4 3**

**94-A man bought some horses, cows and goats. They were 100 in number(totally). If it costed Rs.100 to buy those 100 animals and the cost of a horse, a cow and a goat was Rs.10,Rs.3, 50 paise respectively,how much horses goats and cows did he buy?**

**Source- greekinterview.com year-2006 company - infosys**

**sol-X be horses, y be cows, z be goats**

**According to given condition**

**x+y+z=100**

**10\*x+3\*y+0.5\*z=100**

**Subtracting eqn 1 from eqn 2**

**19\*x+5\*y=100**

**Only possible integers values are x=5 and y=1**

**Hence z=94**

**So 5 horses 1 cow and 94 goats**

**95-A man has two ropes of varying thickness (Those two ropes are not identical, they aren’t the same density nor the same length nor the same width). Each rope burns in 60 minutes. He actually wants to measure 45 mins. How can he measure 45 mins using only these two ropes.**

**He can’t cut the one rope in half because the ropes are non-homogeneous and he can’t be sure how long it will burn?**

**Source- crazyforcode.com year- company- microsoft**

**Sol- He will burn one of the rope at both the ends and the second rope at one end. After half an hour, the first one burns completely and at this point of time, he will burn the other end of the second rope so now it will take 15 mins more to completely burn. so total time is 30+15 i .e. 45 mins.**

**96- You are standing before two doors. One of the path leads to heaven and the other one leads to hell. There are two guardians, one by each door. You know one of them always tells the truth and the other always lies, but you don’t know who is the honest one and who is the liar.**

**Source-crazyforcode.com year- company- infosys**

**Sol- The question you should ask is “If I ask the other guard about which side leads to heaven, what would he answer?”. It should be fairly easy to see that irrespective of whom do you ask this question, you will always get an answer which leads to hell. So you can chose the other path to continue your journey to heaven.**

**This idea was famously used in the 1986 film Labyrinth.**

**Here is the explanation if it is yet not clear.**

**Let us assume that the left door leads to heaven.**

**If you ask the guard which speaks truth about which path leads to heaven, as he speaks always the truth, he**

**would say “left”. Now that the liar , when he is asked what “the other guard (truth teller) ” would answer, he would definitely say “right”.**

**Similarly, if you ask the liar about which path leads to heaven, he would say “right”. As the truth teller speaks nothing but the truth, he would say “right” when he is asked what “the other guard( liar ) ” would answer. So in any case, you would end up having the path to hell as an answer. So you can chose the other path as a way to heaven.**

**97-You have 3 jars that are all mislabeled. One jar contains Apple, another contains Oranges and the third jar contains a mixture of both Apple and Oranges.**

**You are allowed to pick as many fruits as you want from each jar to fix the labels on the jars. What is the minimum number of fruits that you have to pick and from which jars to correctly label them?**

**Source-crazyforcode.com year- company- infosys**

**Labels on jars are as follows:**

****

**sol-Let’s take a scenario. Suppose you pick from jar labelled as Apple and Oranges and you got Apple from it. That means that jar should be Apple as it is incorrectly labelled. So it has to be Apple jar.**

**Now the jar labelled Oranges has to be Mixed as it cannot be the Oranges jar as they are wrongly labelled and the jar labelled Apple has to be Oranges.Similar scenario applies if it’s a Oranges taken out from the jar labelled as Apple and Oranges. So you need to pick just one fruit from the jar labelled as Apple and Oranges to correctly label the jars.**

**98-You’ve got someone working for you for seven days and a gold bar to pay him. The gold bar is segmented into seven connected pieces. You must give them a piece of gold at the end of every day. What and where are the fewest number of cuts to the bar of gold that will allow you to pay him 1/7th each day?**

**gold bar puzzle for interview**

****

**Sol-**

****

**Day 1: Give A (+1)**

**Day 2: Get back A, give B (-1, +2)**

**Day 3: Give A (+1)**

**Day 4:Get back A and B, give C (-2,-1,+4)**

**Day 5:Give A (+1)**

**Day 6:Get back A, give B (-1,+2)**

**Day 7:Give A (+1)**

**99-**