1. Classic: 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? [view solution»](http://www.dailyjobquestions.com/2011/10/25/microsoft-logical-reasoning/)
2. Given a rectangular (cuboidal for the puritans) cake with a rectangular piece removed (any size or orientation), how would you cut the remainder of the cake into two equal halves with one straight cut of a knife? [view solution»](http://www.dailyjobquestions.com/2011/10/25/microsoft-logical-reasoning/)
3. There are 3 boxes. One of them has red balls, one has blue balls only and the other has mixture of red and blue balls. The labels on their boxes always lie. (i.e. if the label says red, you are sure that it doesn’t have red balls only,it could be a mixture) The task is to pick one box and pick only one ball from it and then correctly label all the three boxes.[view solution»](http://www.dailyjobquestions.com/2011/10/25/microsoft-logical-reasoning/)
4. You have 8 balls. One of them is defective and weighs less than others. You have a balance to measure balls against each other. In 2 weighings how do you find the defective one? [view solution»](http://www.dailyjobquestions.com/2011/10/25/microsoft-logical-reasoning/)
5. Why is a manhole cover round? [view solution»](http://www.dailyjobquestions.com/2011/10/25/microsoft-logical-reasoning/)
6. How many cars are there in the USA? (or how many gas stations or how many houses)
7. You’ve got someone working for you for seven days and a gold bar to pay them. The gold bar is segmented into seven connected pieces. You must give them a piece of gold 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? [view solution»](http://www.dailyjobquestions.com/2011/10/25/microsoft-logical-reasoning/)
8. One train leaves Los Angeles at 15mph heading for New York. Another train leaves from New York at 20mph heading for Los Angeles on the same track. If a bird, flying at 25mph, leaves from Los Angeles at the same time as the train and flies back and forth between the two trains until they collide, how far will the bird have traveled? [view solution»](http://www.dailyjobquestions.com/2011/10/28/microsoft-basic-math/)
9. You have two jars, 50 red marbles and 50 blue marbles. A jar will be picked at random, and then a marble will be picked from the jar. Placing all of the marbles in the jars, how can you maximize the chances of a red marble being picked? What are the exact odds of getting a red marble using your scheme? [view solution»](http://www.dailyjobquestions.com/2011/10/27/microsoft-probabilities-math)
10. Imagine you are standing in front of a mirror, facing it. Raise your left hand. Raise your right hand. Look at your reflection. When you raise your left hand your reflection raises what appears to be his right hand. But when you tilt your head up, your reflection does too, and does not appear to tilt his/her head down. Why is it that the mirror appears to reverse left and right, but not up and down? [view solution»](http://www.dailyjobquestions.com/2011/10/26/microsoft-logical-reasoning)
11. You have 5 jars of pills. Each pill weighs 10 gram, except for contaminated pills contained in one jar, where each pill weighs 9 gm. Given a scale, how could you tell which jar had the contaminated pills in just one measurement? [view solution»](http://www.dailyjobquestions.com/2011/10/28/microsoft-basic-math/)
12. If you had an infinite supply of water and a 5 quart and 3 quart pail, how would you measure exactly 4 quarts? [view solution»](http://www.dailyjobquestions.com/2011/10/26/microsoft-logical-reasoning)
13. Implement a multiple-reader-single-writer lock given a compare-and-swap instruction. Readers cannot overtake waiting writers.
14. Given a makefile, design the data structure that a parser would create and then write code that iterates over that data structure executing commands as needed.
15. You have a bucket of jelly beans. Some are red, some are blue, and some green. With your eyes closed, pick out 2 of a like color. How many do you have to grab to be sure you have 2 of the same? [view solution»](http://www.dailyjobquestions.com/2011/10/26/microsoft-logical-reasoning)
16. Which way should the key turn in a car door to unlock it?
17. If you could remove any of the 50 states, which state would it be and why?
18. There are four dogs/ants/people at four corners of a square of unit distance. At the same instant all of them start running with unit speed towards the person on their clockwise direction and will always run towards that target. How long does it take for them to meet and where?[view solution»](http://www.dailyjobquestions.com/2011/10/26/microsoft-logical-reasoning)
19. (from Tara Hovel) A helicopter drops two trains, each on a parachute, onto a straight infinite railway line. There is an undefined distance between the two trains. Each faces the same direction, and upon landing, the parachute attached to each train falls to the ground next to the train and detaches. Each train has a microchip that controls its motion. The chips are identical. There is no way for the trains to know where they are. You need to write the code in the chip to make the trains bump into each other. Each line of code takes a single clock cycle to execute. You can use the following commands (and only these); MF – moves the train forward MB – moves the train backward IF (P) – conditional that is satisfied if the train is next to a parachute. There is no “then” to this IF statement. GOTO
20. Tell me the courses you liked and why did you like them.
21. Give an instance in your life in which you were faced with a problem and you tackled it successfully.
22. What is your ideal working environment?
23. Why do you think you are smart?
24. Questions on the projects listed on the Resume.
25. Do you want to know any thing about the company.( Try to ask some relevant and interesting question).
26. How long do you want to stay in USA and why (I guess non-citizens get this)?
27. What is your geographical preference?
28. What are your expectations from the job?
29. Write a function that returns the angle between the hour and the minute hands of a clock, given input of the time. [view solution»](http://www.dailyjobquestions.com/2011/10/28/microsoft-basic-math/)
30. You are given an array containing both positive and negative integers and required to find the sub-array with the largest sum (O(N) a la KBL). Write a routine in C for the above. [view solution»](http://www.dailyjobquestions.com/2011/10/09/max-subsequence/)
31. Given an array of size N in which every number is between 1 and N, determine if there are any duplicates in it. You are allowed to destroy the array if you like.
32. Write a routine to draw a circle (x **\* 2 + y \*** 2 = r \*\* 2) without making use of any floating point computations at all.
33. Given only putchar (no sprintf, itoa, etc.) write a routine putlong that prints out an unsigned long in decimal.
34. Give a one-line C expression to test whether a number is a power of 2.
35. Given an array of characters which form a sentence of words, give an efficient algorithm to reverse the order of the words (not characters) in it.
36. How many points are there on the globe where by walking one mile south, one mile east and one mile north you reach the place where you started.
37. Give a very good method to count the number of ones in a “n” (e.g. 32) bit number.
38. What are the different ways to implement a condition where the value of x can be either a 0 or a 1. Apparently the if then else solution has a jump when written out in assembly. if (x == 0) y=a else y=b There is a logical, arithmetic and a data structure solution to the above problem.
39. Reverse a linked list. Insert in a sorted list
40. In a Xs and 0s 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.
41. I was given two lines of assembly code which found the absolute value of a number stored in twos complement form. I had to recognize what the code was doing. Pretty simple if you know some assembly and some fundamentals on number representation.
42. Give a fast way to multiply a number by 7.
43. How would go about finding out where to find a book in a library. (You do not know how exactly the books are organized beforehand).
44. Linked list manipulation.
45. Tradeoff between time spent in testing a product and getting into the market first.
46. What to test for given that there is not enough time to test everything you want to.
47. First some definitions for this problem: a) An ASCII character is one byte long and the most significant bit in the byte is always 0. b) A Kanji character is two bytes long. The only characteristic of a Kanji character is that in its first byte the most significant bit is 1. Now you are given an array of a characters (both ASCII and Kanji) and, an index into the array. The index points to the start of some character. Now you need to write a function to do a backspace (i.e. delete the character before the given index).
48. Delete an element from a doubly linked list.
49. Write a function to find the depth of a binary tree.
50. Given two strings S1 and S2. Delete from S2 all those characters which occur in S1 also and finally create a clean S2 with the relevant characters deleted.
51. Assuming that locks are the only reason due to which deadlocks can occur in a system. What would be a foolproof method of avoiding deadlocks in the system.
52. Reverse a linked list.
53. Write a small lexical analyzer – interviewer gave tokens. expressions like “a\*b” etc.
54. Besides communication cost, what is the other source of inefficiency inRPC? How can you optimize the communication?
55. Write a routine that prints out a 2-D array in spiral order!
56. How is the readers-writers problem solved? – using semaphores/ada .. etc.
57. Ways of optimizing symbol table storage in compilers.
58. A walk-through through the symbol table functions, lookup() implementation etc. – The interviewer was on the Microsoft Compiler team.
59. A version of the “There are three persons X Y Z, one of which always lies”.. etc..
60. There are 3 ants at 3 corners of a triangle, they randomly start moving towards another corner. What is the probability that they do not collide.[view solution»](http://www.dailyjobquestions.com/2011/10/27/microsoft-probabilities-math)
61. Write an efficient algorithm and C code to shuffle a pack of cards. This one was a feedback process until we came up with one with no extra storage.
62. There are 4 women who want to cross a bridge. They all begin on the same side. You have 17 minutes to get all of them across to the other side. It is night. There is one flashlight. A maximum of two people can cross at one time. Any party who crosses, either 1 or 2 people, must have the flashlight with them. The flashlight must be walked back and forth, it cannot be thrown, etc. Each woman walks at a different speed. A pair must walk together at the rate of the slower woman’s pace. Woman 1: 1 minute to cross Woman 2: 2 minutes to cross Woman 3: 5 minutes to cross Woman 4: 10 minutes to cross For example if Woman 1 and Woman 4 walk across first, 10 minutes have elapsed when they get to the other side of the bridge. If Woman 4 then returns with the flashlight, a total of 20 minutes have passed and you have failed the mission. What is the order required to get all women across in 17 minutes? Now, what’s the other way?
63. Implement an algorithm to do string matching with wildcards.
64. Some general questions on Lex, Yacc etc.
65. Given an array t[ 100 ] which contains numbers between 1..99. Return the duplicated value. Try both O(n) and O(n-square).
66. Given an array of characters. How would you reverse it. ? How would you reverse it without using indexing in the array.
67. Given a sequence of characters. How will you convert the lower case characters to upper case characters. ( Try using bit vector – solutions given in the C lib -typec.h)
68. Fundamentals of RPC.
69. Given a linked list which is sorted. How will you insert in sorted way.
70. Write a function that takes in a string parameter and checks to see whether or not it is an integer, and if it is then return the integer value.
71. Give a good data structure for having n queues ( n not fixed) in a finite memory segment. You can have some data-structure separate for each queue. Try to use at least 90% of the memory space.
72. Do a breadth first traversal of a tree.
73. What is the difference between an Ethernet Address and an IP address?
74. Write, efficient code for extracting unique elements from a sorted list of array. e.g. (1, 1, 3, 3, 3, 5, 5, 5, 9, 9, 9, 9) → (1, 3, 5, 9).
75. Given an array of integers, find the contiguous sub-array with the largest sum.
76. Given an array of length N containing integers between 1 and N, determine if it contains any duplicates.
77. Sort an array of size n containing integers between 1 and K, given a temporary scratch integer array of size K.
78. An array of integers. The sum of the array is known not to overflow an integer. Compute the sum. What if we know that integers are in 2s complement form?
79. An array of integers of size n. Generate a random permutation of the array, given a function rand\_n() that returns an integer between 1 and n, both inclusive, with equal probability. What is the expected time of your algorithm?
80. An array of pointers to (very long) strings. Find pointers to the (lexicographically) smallest and largest strings.
81. Write a program to remove duplicates from a sorted array.
82. What is a virtual function ? What happens if an error occurs in constructor or destructor. Discussion on error handling, templates, unique features of C++. What is different in C++? ( compare with unix).
83. Given a list of numbers ( fixed list) Now given any other list, how can you efficiently find out if there is any element in the second list that is an element of the first list (fixed list).
84. Given 3 lines of assembly code : Find what it is doing. cwd xor ax, dx sub ax, dx
85. If you are in a boat on a lake and you throw out a suitcase, Will the level of water increase in the lake?
86. Print an integer using only putchar. Try doing it without using extra storage.
87. Write C code for (a) deleting an element from a linked list (b) traversing a linked list
88. What are various problems unique to distributed databases
89. Declare a void pointer
90. Make the pointer aligned to a 4 byte boundary in a efficient manner
91. What is a far pointer (in DOS)
92. What is a balanced tree
93. Given a linked list with the following property node2 is left child of node1, if node2 < node1 else, it is the right child.
94. Describe the file system layout in the UNIX OS
95. In UNIX, are the files allocated contiguous blocks of data
96. Write an efficient C code for tr program. tr has two command line arguments. They both are strings of same length. tr reads an input file, replaces each character in the first string with the corresponding character in the second string. eg. tr abc xyz replaces all a by x, b by y and so on.
97. What is disk interleaving?
98. Why is disk interleaving adopted?
99. Given a new disk, how do you determine which interleaving is the best a) give 1000 read operations with each kind of interleaving determine the best interleaving from the statistics
100. Draw the graph with performance on one axis and n on another, where n in the n in n-way disk interleaving. (a tricky question, should be answered carefully)
101. I was given c++ code and was asked to find out the bug in that. The bug was that he declared an object locally in a function and tried to return the pointer to that object. Since the object is local to the function, it no more exists after returning from the function. The pointer, therefore, is invalid outside.
102. A real life problem – A square picture is cut into 16 squares and they are shuffled. Write a program to rearrange the 16 squares to get the original big square.
103. int **a; char \*c; \*(a) = 20; \*c = \*a; printf(“%c”,**c); what is the output?
104. Write a program to find whether a given m/c is big-endian or little-endian!
105. What is a volatile variable?
106. What is the scope of a static function in C ?
107. What is the difference between “malloc” and “calloc”?
108. struct n { int data; struct n\* next}node; node **c,**t; c→data = 10; t→next = null; \*c = \*t; what is the effect of the last statement?
109. If you are familiar with the ? operator x ? y : z, you want to implement that in a function: int cond(int x, int y, int z); using only ~, !, ^, &, +, |, <<, >> no if statements, or loops or anything else, just those operators, and the function should correctly return y or z based on the value of x. You may use constants, but only 8 bit constants. You can cast all you want. You are not supposed to use extra variables, but in the end, it will not really matter, using vars just makes things cleaner. You should be able to reduce your solution to a single line in the end though that requires no extra vars.
110. You have an abstract computer, so just forget everything you know about computers, this one only does what I am about to tell you it does. You can use as many variables as you need, there are no negative numbers, all numbers are integers. You do not know the size of the integers, they could be infinitely large, so you cannot count on truncating at any point. There are NO comparisons allowed, no if statements or anything like that. There are only four operations you can do on a variable. 1) You can set a variable to 0. 2) You can set a variable = another variable. 3) You can increment a variable (only by 1), and it is a post increment. 4) You can loop. So, if you were to say loop(v1) and v1 = 10, your loop would execute 10 times, but the value in v1 would not change so the first line in the loop can change value of v1 without changing the number of times you loop. You need to do 3 things. 1) Write a function that decrements by 1. 2) Write a function that subtracts one variable from another. 3) Write a function that divides one variable by another. 4) See if you can implement all 3 using at most 4 variables. Meaning, you are not making function calls now, you are making macros. And at most you can have 4 variables. The restriction really only applies to divide, the other 2 are easy to do with 4 vars or less. Division on the other hand is dependent on the other 2 functions, so, if subtract requires 3 variables, then divide only has 1 variable left unchanged after a call to subtract. Basically, just make your function calls to decrement and subtract so you pass your vars in by reference, and you cannot declare any new variables in a function, what you pass in is all it gets. Linked lists
111. Under what circumstances can one delete an element from a singly linked list in constant time?
112. Given a singly linked list, determine whether it contains a loop or not.[view solution»](http://www.dailyjobquestions.com/2011/10/14/loop-test)
113. Given a singly linked list, print out its contents in reverse order. Can you do it without using any extra space?
114. Given a binary tree with nodes, print out the values in pre-order/in-order/post-order without using any extra space.
115. Reverse a singly linked list recursively. The function prototype is node \* reverse (node \*) ;
116. Given a singly linked list, find the middle of the list.
117. Reverse the bits of an unsigned integer.
118. Compute the number of ones in an unsigned integer.
119. Compute the discrete log of an unsigned integer.
120. How do we test most simply if an unsigned integer is a power of two?
121. Set the highest significant bit of an unsigned integer to zero.
122. Let f(k) = y where k is the y-th number in the increasing sequence of non-negative integers with the same number of ones in its binary representation as y, e.g. f(0) = 1, f(1) = 1, f(2) = 2, f(3) = 1, f(4) = 3, f(5) = 2, f(6) = 3 and so on. Given k >= 0, compute f(k).
123. A character set has 1 and 2 byte characters. One byte characters have 0 as the first bit. You just keep accumulating the characters in a buffer. Suppose at some point the user types a backspace, how can you remove the character efficiently. (Note: You cant store the last character typed because the user can type in arbitrarily many backspaces)
124. What is the simples way to check if the sum of two unsigned integers has resulted in an overflow.
125. How do you represent an n-ary tree? Write a program to print the nodes of such a tree in breadth first order.
126. Write the tr program of UNIX. Invoked as tr – str1 – str2. It reads stdin and prints it out to stdout, replacing every occurance of str1[i] with str2[i]. e.g. tr – abc – xyz to be and not to be <- input to ye xnd not to ye <- output
127. How do you use RSA for both authentication and secrecy?
128. What is ARP and how does it work?
129. What is the difference between a switch and a router?
130. Name some routing protocols? (RIP,OSPF etc..)
131. How do you do authentication with message digest(MD5)? (Usually MD is used for finding tampering of data)
132. How do you implement a packet filter that distinguishes following cases and selects first case and rejects second case. i) A host inside the corporate n/w makes a ftp request to outside host and the outside host sends reply. ii) A host outside the network sends a ftp request to host inside. for the packet filter in both cases the source and destination fields will look the same.
133. How does traceroute work? Now how does traceroute make sure that the packet follows the same path that a previous (with ttl – 1) probe packet went in?
134. Explain Kerberos Protocol ?
135. What are digital signatures and smart cards?
136. Difference between discretionary access control and mandatory access control?
137. How do you find the size of a java object (not the primitive type) ?
138. Why is multiple inheritance not provided in Java?
139. Thread t = new Thread(); t.start(); t = null; now what will happen to the created thread?
140. How is garbage collection done in java?
141. How do you write a “ping” routine in java?
142. What are the security restrictions on applets?
143. Write a function to check if two rectangles defined as below overlap or not. struct rect { int top, bot, left, right; } r1, r2;
144. Write a SetPixel(x, y) function, given a pointer to the bitmap. Each pixel is represented by 1 bit. There are 640 pixels per row. In each byte, while the bits are numbered right to left, pixels are numbered left to right. Avoid multiplications and divisions to improve performance.
145. You, a designer want to measure disk traffic i.e. get a histogram showing the relative frequency of I/O/second for each disk block. The buffer pool has b buffers and uses LRU replacement policy. The disk block size and buffer pool block sizes are the same. You are given a routine int lru\_block\_in\_position (int i) which returns the block\_id of the block in the i-th position in the list of blocks managed by LRU. Assume position 0 is the hottest. You can repeatedly call this routine. How would you get the histogram you desire?
146. What does the following code do? xor eax,eax mov ebx,data ; your input data mov cl,bits ; number of bits loop: ror ebx,1 rcl eax,1 dec cl jnz loop
147. Explain what is DMA?
148. What is pipelining?
149. What are superscalar machines and vliw machines?
150. What is cache?
151. What is cache coherency and how is it eliminated?
152. What is write back and write through caches?
153. What are different pipelining hazards and how are they eliminated.
154. What are different stages of a pipe?
155. Explain more about branch prediction in controlling the control hazards
156. Give examples of data hazards with pseudo codes.
157. How do you calculate the number of sets given its way and size in a cache?
158. How is a block found in a cache?
159. Scoreboard analysis.
160. What is miss penalty and give your own ideas to eliminate it.
161. How do you improve the cache performance.
162. Different addressing modes.
163. Computer arithmetic with twos complements.
164. About hardware and software interrupts.
165. What is bus contention and how do you eliminate it.
166. What is aliasing?
167. What is the difference between a latch and a flip flop?
168. What is the race around condition? How can it be overcome?
169. What is the purpose of cache? How is it used?
170. You have 2 candles. Every candle lights for 60 minutes. You have to find the way to measure 45 minutes.
171. A band is going in the street with a constant speed. Someone in the last row has a dog. The dog runs ahead, reaches the front row of the band and gets back to it’s owner. The dog’s speed was constant all the way and while it was running the band passed 50 feet. Find the length of the dog’s path,if the distance between the front and the rear row of the band is 50 feet.
172. A chess board has 64 squares. Two squares in the diagonal corners are erased. Is it possible to cover the remaining 62 squares with 31 dominos? (One domino covers two squares.) Why or How?
173. A man is running across a bridge.When he is 3/8 of the way accross, he heard a train coming behind him. If he keeps running he will reach the end of the bridge at the same time with the train. If he turns around and runs back, he will get to the beginning of the bridge at the same time as the train. The man runs at a speed of 5mph. What is the speed of the train?
174. What does the following code output? void foo(void) { unsigned int a=6; int b=-20; (a+b >6) ? puts(">6") : puts("<=6"); }
175. Write a progam to print a binary tree such that the root is printed in the middle of its left and right sub-trees.
176. What is the difference in memory management between Java and C++? Is it possible to create a memory leak in Java?
177. There are 100 doors in a row that are all initially closed. You make 100 passes by the doors starting with the first door every time. The first time through you visit every door and toggle the door (if the door is closed, you open it, if its open, you close it). The second time you only visit every 2nd door (door #2, #4, #6). the third time, every 3rd door (door #3, #6, #9), etc, until you only visit the 100th door. What is the state of each door after the last pass?
178. There are four ants on a square, one at each corner. At the same time, they all set off for a different corner at random. What is the probability that they don’t collide? [view solution»](http://www.dailyjobquestions.com/2011/10/27/microsoft-probabilities-math)
179. Implement a queue in an array.
180. A man has two paper cubes on his desk. Every day he arranges both cubes so that the front faces show the current day of the month. What numbers are required on the faces of the cubes to allow this for all possible days in the calendar?
181. You have a normal six sided cube. How many different cubes can you make by painting each side using one of siz colors? If you can rotate two cubes to make them look identical in color then they are the same cube!
182. What is the effective way of Device Independent Bitmap files management?
183. What is the volume of a rectangular prism?
184. The Dutch National Flag Problem (The following problem was proposed by W.H.J. Feijen and made famous by Edsger W.Dijkstra, both of Dutch origin.) You are given a row of n buckets, each containing one ball, which may be either red, white, or blue. Your goal is to rearrange the balls in the buckets such that they appear in the order of the colors on the Dutch national flag: red balls should be grouped on the left, the order of the colors on the Dutch national flag: red balls should be grouped on the left, move balls is swap(i,j), which swaps the contents of the i and j buckets. Give pseudocode for a linear-time algorithm for sorting an array B[1..n] of balls in the Dutch national flag order. Your algorithm should use only constant space in addition to the given array.
185. You have a bucket of jelly beans. Some are red, some are blue, and some green. With your eyes closed, pick out 2 of a like color. How many do you have to grab to be sure you have 2 of the same? [view solution;»](http://www.dailyjobquestions.com/2011/10/26/microsoft-logical-reasoning)
186. You are at a party with a friend and 10 people are present including you and the friend. Your friend makes you a wager that for every person you find that has the same birthday as you, you get $1; for every person he finds that does not have the same birthday as you, he gets $2. Would you accept the wager?
187. Given a string, with spaces, replace spaces with %20. You have extra space on the end of the string. (No additional memory and do it as close to O(n) as possible).
188. Write the ‘grow’ function for a C++ vector class
189. How would you determine if someone has won a game of tic-tac-toe on a board of any size?
190. The government wants cars to keep track of whether or not they are speeding. The part to determine this is already able to determine the speed of the vehicle, how would you design the rest of the system.
191. Write a function to find the 2 biggest numbers in an array, and return the sum. How about the K biggest elements in the array, and return the sum. Do both in linear time.
192. Write a function to find the next prime number after a given number.
193. From K sorted arrays, each of size N, how would you construct one big array, and what would the big-O of the procedure be? What if you only had memory of size 2N.
194. Find the nth node in an in-order search of a tree.
195. Find the intersection of 2 sorted integer arrays. What if one of them is huge? What if one of them is so huge, it can’t fit in memory. How do you minimize the number of disk seeks?
196. How do you represnt a directed graph in a relational table?
197. Given 2 strings (as character arrays) A and B, how would you determine if the characters in B were a subset of the characters in A.
198. Given that there are about 4 billion pages indexed by Google, how would you keep from indexing the same page twice?
199. What is the difference between a single-quote, a quote, and a back-tick in the shell?
200. What is the difference between ArrayList and Vector
201. What is the difference between online backup and standby backup?
202. Describe oneway replication vs multimaster replication. How do you deal with the following in a multimaster replication? 1) Update conflicts 2) Delete conflicts 3) Unique conflicts
203. Given an array of integers, find the contiguous sub-array with the largest sum.
204. Given an array in which elements are unsorted. Write an algorithm that gives two indices n1,n2 such that if you sort just the elements of the array from n1 to n2, then the whole array will be sorted.
205. Given an array of n elements, how do you randomly select m elements (m<=n), such that the sum of n elements does not exceed some x ?
206. Given a string s1 and a string s2, write code to say whether s2 is a rotation of s1 using only one call to strstr routine?
207. Given four points in the XY co-ordinate system, write a function to check if it will form a rectangle or not.
208. The problem is to write a set of functions to manage a variable number of byte queues, each with variable length, in a small, fixed amount of memory. You should provide implementations of the following four functions: Q \* create\_queue(); //Creates a FIFO byte queue, returning a handle to it. void destroy\_queue(Q \* q); //Destroy an earlier created byte queue. void enqueue\_byte(Q \* q, unsigned char b); //Adds a new byte to a queue. unsigned char dequeue\_byte(Q \* q); //Pops the next byte off the FIFO queue. So, the output from the following set of calls: Q \* q0 = create\_queue(); enqueue\_byte(q0, 0); enqueue\_byte(q0, 1); Q \* q1 = create\_queue(); enqueue\_byte(q1, 3); enqueue\_byte(q0, 2); enqueue\_byte(q1, 4); printf(“%d”, dequeue\_byte(q0)); printf(“%d\n”, dequeue\_byte(q0)); enqueue\_byte(q0, 5); enqueue\_byte(q1, 6); printf(“%d”, dequeue\_byte(q0)); printf(“%d\n”, dequeue\_byte(q0)); destroy\_queue(q0); printf(“%d”, dequeue\_byte(q1)); printf(“%d”, dequeue\_byte(q1)); printf(“%d\n”, dequeue\_byte(q1)); destroy\_queue(q1); should be: 0 1 2 5 3 4 6 You can define the type Q to be whatever you want. Your code is not allowed to call malloc() or other heap management routines. Instead, all storage (other than local variables in your functions) must be within a provided array: unsigned char data[ 2048 ]; Memory efficiency is important. On average while your system is running, there will be about 15 queues with an average of 80 or so bytes in each queue. Your functions may be asked to create a larger number of queues with less bytes in each. Your functions may be asked to create a smaller number of queues with more bytes in each. Execution speed is important. Worst-case performance when adding and removing bytes is more important than average-case performance. If you are unable to satisfy a request due to lack of memory, your code should call a provided failure function, which will not return: void on\_out\_of\_memory(); If the caller makes an illegal request, like attempting to dequeue a byte from an empty queue, your code should call a provided failure function, which will not return: void on\_illegal\_operation(); There may be spikes in the number of queues allocated, or in the size of an individual queue. Your code should not assume a maximum number of bytes in a queue (other than that imposed by the total amount of memory available, of course!) You can assume that no more than 64 queues will be created at once.
209. Given an N x M two dimensional array of integers where all rows and columns are sorted in ascending order, write a function that can determine if a certain value exists in the array.
210. Implement a breadth first traversal of a binary tree
211. Write a C function to print the link list in reverse order.
212. Two brothers named vinay and pavan went to their grand mothers house to spend some valuable time during their summer vacation. They decide to play each day either tennis in the morning or cricket in the evening but not both on a particular day. Even they either take rest without playing none.. So finally they played for 22 days and at the end of the vacation grand ma send the report to their parents saying they did nothing for 24 mornings and 12 evenings. So how many days they spend their time at grand ma house?
213. How can you convert number nine to number six with a single stroke of pen.
214. How do I change my default e-mail program from Outlook to Outlook Express?
215. Given a 2-d int array in which the values WILL ALWAYS increase in both directions ie. a[i][n+1]>a[i][n] & a[z+1][y] > a[z][y]. Write a function to find whether a value is within this 2-d array in the fastest way possible.
216. You have five pirates, ranked from 5 to 1 in descending order. The top pirate has the right to propose how 100 gold coins should be divided among them. But the others get to vote on his plan, and if fewer than half agree with him, he gets killed. How should he allocate the gold in order to maximize his share but live to enjoy it?
217. Given a function which produces a random integer in the range 1 to 5, write a function which produces a random integer in the range 1 to 7
218. How are cookies passed in the HTTP protocol
219. What is the size of the C structure below on a 32-bit system? On a 64-bit? struct foo { char a; char\* b; };
220. Write a regular expression which matches a email address
221. You are given a the source to a application which is crashing when run. After running it 10 times in a debugger, you find it never crashes in the same place. The application is single threaded, and uses only the C standard library. What programming errors could be causing this crash? How would you test each one
222. Explain how congestion control works in the TCP protocol.
223. Given two binary trees, write a compare function to check if they are equal or not. Being equal means that they have the same values and same structure