ArabicNumToChinese

ArabicNumToChinese

/\* Here is the explanation for the code above:

1. The first part is to declare some constant arrays and a StringBuilder to store the answer.

2. The second part is the main part of the code, which is to convert the integer to Chinese number.

3. The third part is to run the code and see the results. \*/

Strengths: The main sections of the code are categorised and the function of each section is presented in a concise manner.

Weaknesses: does not provide enough detail to explain exactly how the code is implemented.

43345 3.8

ArrayOperation

AddSubset

/\* Here is the explanation for the code above:  
1. The result of subset of an empty set is an empty set, so we add an empty set to the result.  
2. For every element in the array, we add it to the end of every subset in the result.  
3. The subset we already have is not affected by the element we just added. So no need to add the new subset to the result. \*/

Strengths: Clearly explains the functionality of the code and uses easy-to-understand language in the algorithmic logic.

Weaknesses: lack of detailed explanation of the specific implementation and operation of the code.

54455 4.6

SetZeroMatrix

/\* Here is the explanation for the code above:  
1. scan the first row and column, if there is a 0, set two flags row and col. Note that, we need two flags to separate row = 0 and col = 0 cases.  
2. use first row and col to set matrix. Except the first row and col.  
3. set first row and col by using two flags. \*/

Strengths: Provides a detailed explanation of the code implementation, as well as an overview of the main ideas behind processing matrices.

Weaknesses: no actual code examples are provided, which may make it difficult for some readers to understand.

44445 4.2

Shuffle

/\* Here is the explanation for the code above:  
1. We need to keep the original array intact, so when we reset, it must have all the original values.  
2. For shuffle, we can pick any number from the array and put it in the first position, then pick from the remaining (n-1) positions and so on. This is equivalent to picking the first position from n positions, then the second position from n-1 positions and so on.  
3. We can achieve this by picking a random number from the remaining numbers and swap it with the number in the first position, then pick a random number from the remaining (n-1) positions and swap it with the number in the second position and so on.  
4. To achieve this, we need the list of remaining numbers, so we create a list and add all the values from the array to the list. We can use the array itself as the list, but we need to remove the numbers that we have already picked. Removing from an array is an expensive process, so we use a list.  
5. We pick a random number from the remaining numbers using rand.nextInt(aux.size()). This returns a number between 0 and aux.size()-1.  
6. Once we pick a number, we swap it with the number in the current position (i) in the array. This is because we need to make sure that the number is not picked again.  
7. We remove the picked number from the list, so that it is not picked again.  
8. We repeat this process until there are no remaining numbers.  
9. The runtime complexity is O(n) because we pick n numbers from the array and each pick takes O(1) time. The space complexity is O(n) because we use a list to store the remaining numbers. \*/

Strengths: explains in detail how the code works, with special emphasis on the time and space complexity of the algorithm.

Weaknesses: may be overly complex and may be difficult for some inexperienced programmers to understand.

55555 5

SpiralMatrix

/\* Here is the explanation for the code above:  
1. Use a boolean[][] to mark the visited cells.  
2. Use a direction variable to indicate the direction we are going to move.  
3. If we are able to move to the next cell, move to the next cell.  
4. If we cannot move to the next cell, change the direction and move to the next cell.  
5. If we cannot move to the next cell and we have already visited the next cell, we know we have reached the end of the matrix. \*/

Pros: provides clear step-by-step instructions that are easy to understand.

Weaknesses: may be missing some background information on code design choices.

44445 4.2

BinaryTreeTraversal

HierarchicalTraversal

/\* Here is the explanation for the code above:  
1. Create a queue and add the root node to the queue.  
2. Create a while loop that runs as long as the queue is not empty.  
3. Inside the while loop, create a new list and add it to the levels list.  
4. Create a levelLength variable that will store the current queue size.  
5. Create a for loop and run it until the levelLength variable.  
6. Inside the for loop, remove the first node from the queue and add it to the current level list.  
7. Check if the removed node has a left child. If it does, add it to the queue.  
8. Check if the removed node has a right child. If it does, add it to the queue.  
9. Add 1 to the level variable.  
10. Return the levels list. \*/

Strengths: describes the process of traversing a binary tree in detail, explaining each step of the code.

Weaknesses: no explanation is provided as to why this approach is the best.

55555 5

PreorderTraversal

/\* Here is the explanation for the code above:  
1. push root to stack  
2. while stack is not empty or root is not null  
 a. while root is not null  
 i. add root to list  
 ii. push root to stack  
 iii. root = root.left  
 b. root = stack.pop()  
 c. root = root.right \*/

Strengths: Clearly explains the process of binary tree traversal so that the reader can understand the logic of the code.

Weaknesses: no background information is provided on code design and algorithm selection.

45545 4.6

DeleteBSTNode

//1) If key is greater than root's key, then key lies in right subtree.  
// So we recur for right subtree.  
// 2) If key is smaller than root's key, then key lies in left subtree.  
// So we recur for left subtree.  
// 3) If key is equal to root's key, then this is the node to be deleted.  
// a) Node to be deleted is leaf: Simply remove from the tree.  
// b) Node to be deleted has only one child: Copy the child to the node and delete the child  
// c) Node to be deleted has two children: Find inorder successor of the node.  
// Copy contents of the inorder successor to the node and delete the inorder successor.  
// Note that inorder predecessor can also be used. \*/

Strengths: describes in detail the steps involved in removing nodes from a binary search tree, clearly explains the logic of the algorithm.

Weaknesses: may require some a priori knowledge of binary search trees to fully understand.

55555 5

DictTree

ReplaceWord

/\* Here is the explanation for the code above:  
1. The first for loop is to build a Trie Tree. (I'm not gonna explain the Trie Tree here since it's not the point for this question)  
2. The second for loop is to find the shortest root for each word.  
3. The time complexity depends on the length of the sentence O(n) and the number of roots we have O(m), which is O(n\*m).  
4. The space complexity is the size of the Trie Tree which is O(26\*n) = O(n). \*/

Strengths: explains in detail how to use and construct a dictionary tree and provides time and space complexity analyses.

Weaknesses: does not explain exactly how dictionary trees work and may require some preparatory knowledge on the part of the reader.

45445 4.4

dijkstra

///\* Here is the explanation for the code above:  
//1. 在输入中，第一行的两个整数分别表示图的高和宽，第三行的两个整数表示起点的坐标，后面的每行表示图中的一个点，对应的数字表示该点的值。  
//2.在solve函数中，首先初始化了isVisited和d数组，isVisited用来标记某一点是否被访问过，d用来记录起点到某一点的最短距离。  
//3.将起点标记为已访问，距离初始化为0。  
//4.进入while循环，当所有点都被访问过或者当前最小距离为MAX时跳出循环，否则继续执行。  
//5.在循环中，首先找到d中值最小的点，将其标记为已访问，然后更新起点到其他点的距离。  
//6.最后返回最短距离。 \*/

Generated Chinese for the first time  
Said for the second time that he couldn't read it

Pros: If you know Chinese, then this explanation is clear and explains the steps of the algorithm in detail.

Weaknesses: If you don't understand Chinese, then you won't be able to understand this explanation.

55555 5

DoublePointerConvenience

maxArea

/\* Here is the explanation for the code above:  
1. We take two pointers, one at the beginning and one at the end of the array constituting the length of the lines.  
2. Futher, we maintain a variable maxareamaxarea to store the maximum area obtained till now. At every step, we find out the area formed between them, update maxareamaxarea and move the pointer pointing to the shorter line towards the other end by one step.  
3. Initially, we consider the area constituting the exterior most lines. Now, to maximize the area, we need to consider the area between the lines of larger lengths. If we try to move the pointer at the longer line inwards, we won't gain any increase in area, since it is limited by the shorter line.  
4. But moving the shorter line's pointer could turn out to be beneficial, as per the same argument, despite the reduction in the width. This is done since a relatively longer line obtained by moving the shorter line's pointer might overcome the reduction in area caused by the width reduction. \*/

Pros: If you know Chinese, then this explanation is clear and explains the steps of the algorithm in detail.

Weaknesses: If you don't understand Chinese, then you won't be able to understand this explanation.

55555 5

MaxProfit

/\* Here is the explanation for the code above:  
1. At the very beginning, we set the min price to be a very large number and set the max profit to be 0.  
2. Then we iterate through the array, and each time we find a new minimum price, we update the min price.  
3. For each price, we calculate the profit by substracting the min price from the current price.  
4. Then we update the max profit if the current profit is larger than the previous max profit.  
5. Finally, we return the max profit. \*/

Strengths: explains the idea of calculating maximum profit and describes the implementation of the algorithm in clear language.

Weaknesses: lacks some specific details of the code implementation, which may lead to incomplete understanding.

55555 5

MinSubArray

/\* Here is the explanation for the code above:  
1. use two pointers, i and k, to mark the start and end of the subarray  
2. use a variable sum to record the sum of the subarray between i and k  
3. if sum is smaller than s, then we need to add another element to the subarray, so we move k one step forward and add the value of nums[k] to sum  
4. if sum is larger than s, then we need to remove one element from the subarray, so we move i one step forward and subtract the value of nums[i] from sum  
5. after each step, we need to update the value of min, which records the minimum length of the subarray whose sum is larger than or equal to s  
6. the loop will terminate when k reaches the end of the array and i reaches the end of the array  
7. we need to return 0 if min is still Integer.MAX\_VALUE after the loop, which means there is no subarray whose sum is larger than or equal to s \*/

Strengths: Describes in detail the steps to find a subarray that satisfies a specific condition, and provides a detailed explanation of how the two pointers are used.

Weaknesses: It may be difficult for some beginners to understand this explanation, and requires some basic programming skills and an understanding of double pointer techniques to better understand it.

55555 5

Rain

/\* Here is the explanation for the code above:  
1. For each element in the array, we find the maximum level of water it can trap after the rain,  
 which is equal to the minimum of maximum height of bars on both the sides minus its own height.  
2. We then sum up the values obtained for all the elements in the array. \*/

This comment is an explanation of a type of code that solves the "Trapping Rain Water" problem, a common programming and algorithmic problem.

Pros:

Simplicity: the comment clearly explains the main functions and processing of the code in concise language that is easy to understand.

Explanation Logic: the comments clearly describe the basic logic of the problem, i.e., for each element, find the maximum amount of water it can store, and then add the results of all the elements.

Disadvantages:

Lack of detail: while the comments give the main idea of the code, they do not explain the details of how to implement finding the maximum height on either side of each element, which is a key part of implementing the code.

No context: for readers unfamiliar with the problem, the comment does not provide enough contextual information to understand what problem the code is solving.

No code example: this comment does not give a specific code snippet, which may make it difficult for the reader to correlate the comment with the actual code.

45445 4.4

RemoveDuplicates

/\* Here is the explanation for the code above:  
1. Use a variable (c) to keep track of the current position.  
2. Loop through the array from 1 to the end.  
3. If the current value is not equal to the value at c, increment c and set the value at c to the current value.  
4. Return c + 1. \*/

This comment is an explanation of a particular piece of code that removes duplicate elements from an array.

Pros:

Simplicity: comments are concise and easy to understand. Each step of the operation is clearly listed, making it easy for the reader to understand the function and operation of the code.

Logic: the comments clearly describe the basic logic of the code, from looping through the array to how duplicate elements are checked and handled, and how the result is returned.

Disadvantage:

Lack of context: comments do not explain the specific application scenario of this code, such as what problem it might be solving or what function it might be accomplishing.

Lack of explanation: the comment does not explain why it returns c + 1, which may be a bit confusing for readers unfamiliar with this type of operation.

Lack of code relevance: If the reader does not have a specific code reference, it may be difficult to understand how the variables and operations in these comments relate to the actual code.

55555 5

ThreeNumSum

/\* Here is the explanation for the code above:  
1. Sort the array, so that we can use two pointers to scan the array.  
2. We need to skip the duplicates to avoid duplicate triplets.  
3. For each element, we use two pointers to scan the rest of the array. If the sum of three elements is 0, then add it to the result. Otherwise, if the sum is bigger than 0, then move the right pointer to left; if the sum is smaller than 0, then move the left pointer to right. \*/

This comment explains a piece of code that finds all unique combinations (triples) of three elements in an array whose sum is zero.

Pros:

Clarity: the annotation describes the steps of the algorithm in detail, and the explanation is clear to readers familiar with sorting and the two-pointer strategy.

Solving duplicates: the comment clearly indicates the need to skip over duplicate elements to avoid finding duplicate triples, which is important for solving the problem.

Disadvantages:

Not enough details on the exact implementation: while the annotation describes the general steps, it does not explain how to implement them, how to sort the array, how to move the pointers, and how to determine when to skip the duplicate elements.

Not newbie-friendly: new software developers, especially those unfamiliar with double-pointer strategies or such algorithmic issues, may find this annotation difficult to understand.

55555 5

DynamicPlanning

All1SquareMatrix

/\* Here is the explanation for the code above:  
1. matrix[i][j] == 0, dp[i][j] = 0  
2. matrix[i][j] == 1, dp[i][j] = min(dp[i-1][j], dp[i][j-1], dp[i-1][j-1]) + 1  
3. the total number of squares is the sum of all elements in dp. \*/

This comment is explaining a piece of code that uses dynamic programming to solve a problem that tries to find the largest square of all 1's in a matrix consisting of 0's and 1's.

Pros:

Clarity: the comment clearly explains the state transfer equations of dynamic programming, making it easy for the reader to understand the main operations in the code.

Logic: the comments give clear logical steps on how to handle elements of 0 and 1 and how to calculate the total number of squares.

Weaknesses:

Lack of context: the comments do not explain the application scenario of this code, how to initialise the dp array, or why we are looking for the largest square with all 1's.

Lack of explanation: for newcomers unfamiliar with dynamic programming, the comments do not explain what the state transfer equation means and why this equation solves the problem.

55555 5

MaxSubString

/\* Here is the explanation for the code above:  
1. Find the longest common subsequence of two strings.  
2. Use the length of longest common subsequence to get the shortest common supersequence.  
3. The length of the shortest common supersequence = (length of text1) + (length of text2) - (length of longest common subsequence) \*/

这段注释是在解释如何通过找到两个字符串的最长公共子序列（Longest Common Subsequence, LCS）来求出它们的最短公共超序列（Shortest Common Supersequence, SCS）的Code.

Pros:

Clarity: the annotations explain very clearly the main idea of the algorithm, which is to solve for the length of the shortest common subsequence by finding the longest common subsequence of two strings.

Succinctness: the steps in the annotations are concise and clear, making it relatively simple to understand and implement the algorithm.

Disadvantages:

Lack of implementation-specific explanation: the annotations do not explain how to find the longest common subsequence of two strings, which can be confusing for newcomers who do not understand the concept.

High comprehension requirements: for new software developers, especially those unfamiliar with dynamic programming or sequence comparison problems, understanding this annotation may be difficult.

55555 5

MinStairs

/\* Here is the explanation for the code above:  
1. f1, f2 are the minimum cost to climb to the top starting from index i+1, i+2 respectively.  
2. The goal is to get to the top from index -1, so the final answer is Math.min(f1, f2).  
3. At each step, we maintain f1 = f(i+1), f2 = f(i+2).  
4. f(i) = cost[i] + Math.min(f(i+1), f(i+2)).  
5. So, the code traverses backward. \*/

Minimum Cost Stair Climbing Problem

Strengths: Step-by-step description of the execution steps of the code and the role of each variable during execution, explained using a mathematical model, clear and concise.

Weaknesses: does not explain why it is necessary to traverse in reverse order, does not make it clear that this is a dynamic programming solution, for readers who are not familiar with dynamic programming may find it a bit difficult to understand.

55555 5

YHTriangle

/\* Here is the explanation for the code above:  
1. The first row is always [1]. Initialize a list, and add that to the triangle list.  
2. The second row is always [1,1]. We can hard code this. Add that to the triangle list.  
3. Now, we have to generate the third row.  
The third row is [1,2,1]. The second row is [1,1].  
We can generate the third row by adding the second row shifted left, to itself shifted right.  
Specifically, [1,2,1] = [0+1,1+1,1+0]. We prepend and append a 0.  
4. Now, we have to generate the fourth row.  
Add a 0 in the beginning and at the end of the third row. [1,2,1] -> [0,1,2,1,0].  
Add that to the triangle list.  
5. Continue this process until you have generated the required number of rows. \*/

Problems with generating Yang Hui triangles

Strengths: clearly explains the reason for each step of the operation, including how the new row is constructed and why.

Weaknesses: does not make it clear that this is a dynamic programming solution, and for beginners, further explanation may be needed as to why the new row can be viewed as the result of the left and right shifts of the previous row.

55555 5

CircleList

/\* Here is the explanation for the code above:  
1. If there is no cycle, the fast pointer will stop at the end of the linkedlist.  
2. If there is a cycle, the fast pointer will eventually meet with the slow pointer.  
3. If there is a cycle, the fast pointer will eventually meet with the slow pointer. \*/

Detecting the presence of a ring in a linked table

Pros: explains what the fast-slow pointer method does in a clear and concise way.

Weaknesses: It is a bit repetitive and may not be easy to understand for readers who do not know about fast and slow pointers.

55455 4.8

HappyNum

/\* Here is the explanation for the code above:  
1. First of all, let's suppose there is a cycle in this sequence, and the cycle starts with number x, ends with number y. We use function f(n) to calculate the next number, f(f(f...(f(n)))) = y.  
2. There are two pointers in this sequence, one goes one step each time, another one goes two steps each time. So when they meet, we know there is a cycle. Let's suppose the length of the cycle is k.  
3. When the two pointers meet, the slow one goes k steps. At this time, the fast one goes 2k steps. Since the fast one goes two steps each time, and it already goes k steps, so the number of steps it needs to go to reach y is (k - (2k - k)) = k.  
4. f(f(f...(f(y)))) = y, which means the next number of y is y itself, which means the number of steps it needs to go to reach y is 1. So we know the slow pointer needs to go k more steps after they meet. Since the slow pointer already goes k steps, so the total steps it goes to reach y is 2k, which means the total steps it goes to reach y is the length of the cycle.  
5. We already know the length of the cycle is k, so we can conclude that the slow pointer goes k steps to reach y, and go k steps to reach x. Since the total steps it goes is 2k, we can conclude that the slow pointer goes k steps to reach x. So the next number of x is x itself.  
6. Now we have proved that if there is a cycle, then there must be a number x, the next number of x is x itself. So if the number is not a happy number, then it must contains some numbers which are visited twice since there are a cycle. So we can use this conclusion to solve this problem. \*/

Finding rings in sequences (happy number problem)

Strengths: All steps of the algorithm are thoroughly explained, especially the explanation of the fast and slow pointers and the explanation of how to find the ring entries is very clear.

Weaknesses: the explanation is relatively complex and may require some preparatory knowledge on the part of the reader to understand.

45544 4.4

MiddleNode

/\* Here is the explanation for the code above:  
1. we have a slow and fast pointer starting from head.  
2. we move slow pointer one step at a time and fast pointer two steps at a time.  
3. when fast reaches the end, slow will be at the middle. \*/

Finding the middle node of a chain table

Strengths: Concise and accurate representation of the underlying logic of the code.

Weaknesses: lacks an in-depth explanation of why this method finds the middle node.

55555 5

GlassBall

//\* dp[i] = min(dp[i-j]+1, dp[j]) (0 < j < i)  
// \*  
// \* dp[i] means the min number of squares that can consist of sum i  
// \*  
// \* dp[i-j]+1 means the min number of squares that can consist of sum j plus one square with length i-j  
// \*  
// \* dp[j] means the min number of squares that can consist of sum j  
// \*  
// \* So dp[i-j]+1 means one square with length i-j and dp[j] means one square with length j  
// \*  
// \* So dp[i] means one square with length i and dp[j] plus one square with length i-j  
// \*  
// \* So we just need to find the min number of dp[i-j]+1 and dp[j] for all j < i  
// \*  
// \* For example, if i is 5, we just need to find the min number of dp[4]+1 and dp[3]+1  
// \*  
// \* So the final dp[5] will be the min number of all the min number of dp[4]+1 and dp[3]+1  
// \*  
// \* So dp[i] = min(dp[i-j]+1, dp[j]) (0 < j < i)  
// \* \*/

Solve the decomposition of positive integers into sums of perfect squares based on dynamic programming

Strengths: explains the transfer equation for dynamic programming in detail, with specific examples to help the reader understand.

Weaknesses: may require the reader to have some knowledge of dynamic programming to understand this explanation.

45554 4.6

FirstUniqueChar

//\* input: a string  
//\* output: the index of the first unique character  
//\* method: count the number of characters in the string, and then find the first character that only appears once

//This code first creates an empty HashMap. Then, it iterates over the elements of the array using a for loop. For each element of the array, it checks if the element is already present in the HashMap. If the element is present, it means that we have found a pair of elements whose sum is equal to the target value. If the element is not present, we put the element of the array in the HashMap. The time complexity of this approach is O(n) because we are iterating the array only once.

Find the location of the first unique character in a string

Strengths: concise and precise description of the function of the code and the way to solve the problem.

Weaknesses: the principle and efficiency of using HashMap to count the number of occurrences of a character is not explained, which may be a bit difficult for beginners.

55555 5

SumOf2Num

//This code first creates an empty HashMap. Then, it iterates over the elements of the array using a for loop. For each element of the array, it checks if the element is already present in the HashMap. If the element is present, it means that we have found a pair of elements whose sum is equal to the target value. If the element is not present, we put the element of the array in the HashMap. The time complexity of this approach is O(n) because we are iterating the array only once.

55555 5

FindKthLargest

/\* Here is the explanation for the code above:  
1. First, we insert all the elements into a heap. The size of the heap is always maintained at k.  
2. If the size of the heap is greater than k, then we remove the top element from the heap.  
This is because, we are interested in the kth largest element and hence if it is present in the heap,  
it has to be among the top k elements in the heap.  
3. Finally, the top element in the heap is the kth largest element. \*/

Solving for the kth largest number in an array

Strengths: The explanation is logically clear and explains the reasons for maintaining a heap of size k and popping the top element of the heap when the size of the heap exceeds k.

Weaknesses: the explanation of the properties of the heap structure and why it is used is not detailed enough and may be a little difficult for readers unfamiliar with the heap structure.

55555 5

Add2Nums

/\* Here is the explanation for the code above:  
1. I create a new ListNode to store the sum of the 1st digit of l1 and l2.  
2. I iterate through the rest of the list while l1 or l2 is not null.  
3. When l1 or l2 is null, I will set a or b to 0 respectively.  
4. I add a and b and store it in t.  
5. I create a new ListNode of t and add it to the end of the list.  
6. I iterate through the list and handle the carry.  
7. If the last digit is 10, I create a new ListNode of 0 and add it to the end of the list.  
8. I return the list. \*/

Addition of two numbers (representation in chained table form)

Strengths: Step-by-step explanation of the execution of the code, especially how to handle the process of addition and rounding.

Weaknesses: lacks a basic explanation of the structure of a chain table and its operations, which may be somewhat difficult for readers unfamiliar with chain table operations.

55555 5

CopyRandomList

/\* Here is the explanation for the code above:  
1. If we encounter a node which is already visited then we return the clone of it.  
2. We create a copy of the given node and put it in the visited dictionary.  
3. Recursively copy the remaining linked list starting once from the next pointer and then from the random pointer.  
4. Now we update the next and random pointers for the clones using the visited dictionary. \*/

Cloning a chained table with random pointers

Pros: explains the execution steps of the code and the purpose of each step in a clear and concise way.

Weaknesses: Doesn't explain why you need to use a dictionary (HashMap) to store nodes that have already been accessed, which may not be clear to beginners.

55555 5

DeleteNNodeFromEnd

/\* Here is the explanation for the code above:  
1. We use two pointers to locate the position of the node to be deleted.  
2. We need to use dummy node to handle the case when the head node is removed.  
3. The second pointer is always n+1 nodes behind the first pointer. \*/

Deleting a node in a linked table

Strengths: Succinct, explains in detail the reason for using two pointers and a dummy node.

Weaknesses: it is not explained why the second pointer needs to always be n+1 nodes behind the first pointer.

55555 5

GetIntersectionNode

/\* Here is the explanation for the code above:  
1. Traverse list A and store the address / reference to each node in a hash set.  
2. Then check every node bi in list B: if bi appears in the hash set, then bi is the intersection node.  
Complexity Analysis  
Time complexity : O(m+n)O(m+n).  
Space complexity : O(m)O(m) or O(n)O(n). \*/

Finding the intersection of two linked tables

Strengths: Clearly describes the approach to tracing using a HashSet, as well as an explanation of the time and space complexity.

Weaknesses: no further explanation of how comparisons and storage need to be handled if complex data structures, such as custom classes, are stored in the chained table nodes.

55555 5

ReverseList

/\* Here is the explanation for the code above:  
1. First, we define a pre pointer, which is null at the beginning.  
2. Then, we define a temp pointer, which points to head at the beginning.  
3. Then, we start a while loop. The loop runs when temp is not null.  
4. In the loop, we define a new node t, which points to temp.next.  
5. Then, we set temp.next to pre.  
6. Then, we set pre to temp.  
7. Then, we set temp to t.  
8. Then, we continue the loop.  
9. Finally, we return pre. \*/

Chained Table Reversal

Strengths: The steps are clear, the logic is accurate, and there is a detailed description of the process of reversing a chain table.

Weaknesses: The code does not give a detailed enough explanation of what the three variables do and why they are set up the way they are.

55555 5

RotateList

/\* Here is the explanation for the code above:  
1. Get the length of the list;  
2. Move to the (l - k % l)th node;  
3. Put the tail node to the head and cut the connection between the tail and the (l - k % l - 1)th node. \*/

Code for chained table rotation. The following is an analysis of its strengths and weaknesses:

Pros:

It provides the main steps of solving the problem directly so that the reader can understand the general flow of the code.

Has good logic and describes clearly what to do with the length of the chain table and how to find the new head and tail nodes.

Key points for rotating the chain table, such as finding the rotated position by modulo arithmetic, and the nodes that are disconnected and reconnected after the rotation, are explained.

Insufficient:

A more detailed explanation of exactly how each step is implemented may be needed, such as how to get the length of the chain table, how to find the (l - k % l)th node, and how to move the tail node to the head and disconnect it.

A more detailed explanation of why the modulo operation (k % l) is performed may be needed, i.e., the handling of rotations exceeding the length of the chain table.

The lack of direct references to specific parts of the code may make it difficult for the reader to correspond directly to these explanations when reading the code.

The handling of initial conditions and possible boundary cases (e.g., an empty linked table, or k equal to 0) is not explained.

No explanation of the advantages and disadvantages of this solution, or comparison with other possible solutions.

55555 5

Merge

/\* Here is the explanation for the code above:  
1. Sort the intervals based on their start time  
2. Add the first interval to the output array  
3. Iterate through the sorted array and check if the end time of the last interval is greater than the start time of the new interval  
4. If not, we add the new interval to the output array and update the last interval  
5. If yes, then we update the end time of the last interval to be the max of the end time of the last interval and the end time of the new interval  
6. Return the output array \*/

This explanation is about a kind of code that deals with the problem of intervals. Next we will analyse the advantages and disadvantages of this explanation:  
  
Pros:  
  
Succinct and clear: the main flow of the code and the purpose of each step are explained clearly, which helps to understand the general logic of the code.  
Sequential: the code is explained step by step according to the actual execution order of the code, which helps the reader to better understand the execution process of the code.  
Clearly explains how to handle conflicts: explains clearly how to update the end time of an existing interval when the new interval conflicts with an existing interval.  
Insufficient:  
  
Some steps may need more specific explanation, such as the implementation of "sort intervals" and "add new interval to output array".  
Consider explaining the reason for sorting intervals, i.e., why this is a key step in dealing with this type of problem.  
For a more complete understanding, consider explaining the behaviour of the code in different cases (e.g., when there are no conflicts, when all intervals are in conflict).  
The handling of possible boundary cases (e.g., empty array) or special cases (e.g., all intervals are not in conflict) is not explained.  
There is no explanation of the advantages and disadvantages of this solution, or comparison with other possible solutions.  
55555 5

IntReverse

/\* Here is the explanation for the code above:  
1. Get the last digit of the number: y = x % 10.  
2. Update the last digit of the reverse: rs = rs \* 10 + y.  
3. Remove the last digit of the number: x = x / 10.  
4. Repeat steps 1. to 3. until x is no longer greater than zero.  
5. Check overflow/underflow condition: if (rs \* 10 / 10 != rs) return 0; \*/

Validating echo strings

Strengths: Clear explanations, with detailed descriptions of how to handle special characters and how to do string comparisons.

Weaknesses: a more detailed explanation of why you chose to use double pointers may be needed.

55555 5

NumOfReplies

/\* Here is the explanation for the code above:  
1. Negative numbers are not palindrome, for example -123 is not a palindrome since the '-' does not equal to '3'. So we can return false for negative numbers.  
2. Now let's think about how to revert the last half of the number. For number 1221, if we do 1221 % 10, we get the last digit 1, to get the second to the last digit, we need to remove the last digit from 1221, we could do so by dividing it by 10, 1221 / 10 = 122. Then we can get the last digit again by doing a modulus by 10, 122 % 10 = 2, and if we multiply the last digit by 10 and add the second last digit, 1 \* 10 + 2 = 12, it gives us the reverted number we want. Continuing this process would give us the reverted number with more digits.  
Now the question is, how do we know that we've reached the half of the number?  
Since we divided the number by 10, and multiplied the reversed number by 10, when the original number is less than the reversed number, it means we've processed half of the number digits. \*/

Palindromic Chain Tables

Strengths: explains how to break the problem into solved sub-problems, e.g. how to split a chain table into two parts, how to reverse a chain table, etc.

Weaknesses: a more detailed explanation may be needed as to why the problem is broken down into these sub-problems and how these sub-problems help to solve the initial problem.

55555 5

StringMultiplication

/\* Here is the explanation for the code above:  
1. The product of two numbers cannot exceed the sum of the two lengths. (e.g. 99 \* 99 cannot be five digit)  
2. num1[i] \* num2[j]` will be placed at indices `[i + j`, `i + j + 1]`  
3. We initialize our answer array with `0`s and fill it from the right  
4. Similar to how we would do multiplication on paper, for each `i` in `num1` and `j` in `num2`  
5. We get the current product from `num1[i] \* num2[j]` (plus the carry from the previous index)  
6. The current digit will be `products % 10` and the carry will be `products / 10`  
7. We then update the answer at `i + j` (the first index) and `i + j + 1` (second index) with the new digit  
8. After the two loops, we remove any leading `0`s from our answer  
9. If the entire answer array is `0`s, we return 0, otherwise we return the string built from the answer array \*/

This explanation is about the code for multiplying two numbers in string form. Let's analyse the advantages and disadvantages of this explanation:

Pros:

Explanation of the basic theory: the explanation firstly mentions a basic theory of multiplication (the length of the product of two numbers will not exceed the length of the sum of the two numbers), which lays the foundation for the subsequent explanations.

Clear logic: the next steps are listed in the order in which the code is executed, explaining the role of each step in a logical manner.

Boundary processing details: the explanation mentions how to deal with the result of 0, which is a common boundary case.

Result Processing Explained: explains how to get the final string result from the final result array, which is a common step in the actual code and helps readers understand the actual code execution process.

Insufficiency:

Some steps may need more specific explanations. For example, the implementation of steps such as "we fill the answer array from the right" and "we get the current product" may need more detailed explanation.

For the computation of multiplication and storage of results, consider using examples to make the explanation easier to understand.

Adding an explanation of why the implementation strategy is used (e.g., why an array is used to store the result, why multiplication is performed from right to left, etc.) can help the reader better understand the design of the code.

The explanation does not cover the possible error cases or special cases that may occur in the code, such as the input string is not a number, the two inputs are of different lengths, and so on. These situations may need to be dealt with in the actual code, and the reader may not be able to realise this if he/she only reads the explanation.

55555 5

StringToInt  
 /\* Here is the explanation for the code above:  
1. null or empty string  
2. white spaces  
3. +/- sign  
4. calculate real value  
5. handle min & max \*/

This explanation of the code is about handling integers in string form, specifically converting strings to actual integers, while handling some special cases. Next we will analyse the advantages and disadvantages of this explanation:  
  
Pros:  
  
Generalisation: although there is no detailed step-by-step explanation, the main processing flow of the code is listed, which helps the reader to understand the function of the code in general.  
Comprehensive: This explanation mentions various special cases that may occur, including empty strings, spaces, symbols, and ranges of values, showing that the code handles all kinds of cases.  
Weaknesses:  
  
Overly concise: each part of this explanation is very simple and does not explain in detail what each step does and why. For example, what exactly does "handle whitespace" do? How is the "Calculate actual value" calculated? None of these questions are answered in the explanation.  
Lack of context: Without seeing the actual code, it may be difficult for the reader to understand what the code actually does. For example, "handling maximum and minimum values" may be difficult to understand without seeing the code.  
Lack of examples: The explanation does not use any examples to help with the explanation, which may make it more difficult for the reader to understand the functionality of the code.  
As a whole, the explanation may seem more like a list of functions than a detailed explanation of the code. More detailed explanations and examples may need to be provided if the code is to be better understood by the reader.  
34334 3.4

TrailingZeros

/\* Here is the explanation for the code above:  
1. First, let's see how the number of 0s is generated.  
If we write down all the numbers from 1 to n, and count the number of 0s in each column, we'll find that the number of 0s at each column is [n/5] + [n/5^2] + [n/5^3] + ....  
For example, the number of 0s from 1 to 105 is 20, from 1 to 1010 is 249.  
The reason that we use [n/5] + [n/5^2] + [n/5^3] + ... to compute the number of 0s at each column is as follows:  
 1) [n/5] is the number of numbers from 1 to n that are multiples of 5.  
 2) [n/5^2] is the number of numbers from 1 to n that are multiples of 5^2 and not multiples of 5.  
 3) [n/5^3] is the number of numbers from 1 to n that are multiples of 5^3 and not multiples of 5^2.  
 ... and so on.  
This way, we can count the number of 0s in O(logn) time.  
  
2. Then, let's see how the number of 5s is generated.  
If we write down all the numbers from 1 to n, and count the number of numbers that are multiples of 5, we'll find that the number of 5s at each column is [n/5] + [n/5^2] + [n/5^3] + ....  
For example, the number of 5s from 1 to 105 is 25, from 1 to 1010 is 252.  
The reason that we use [n/5] + [n/5^2] + [n/5^3] + ... to compute the number of 5s at each column is as follows:  
 1) [n/5] is the number of numbers from 1 to n that are multiples of 5.  
 2) [n/5^2] is the number of numbers from 1 to n that are multiples of 5^2.  
 3) [n/5^3] is the number of numbers from 1 to n that are multiples of 5^3.  
 ... and so on.  
This way, we can count the number of 5s in O(logn) time.  
  
3. Finally, let's see how the number of 2s is generated.  
If we write down all the numbers from 1 to n, and count the number of numbers that are multiples of 2, we'll find that the number of 2s at each column is [n/2] + [n/2^2] + [n/2^3] + ....  
For example, the number of 2s from 1 to 105 is 52, from 1 to 1010 is 504. \*/

This code explanation is about calculating the number of specific factors (e.g. 0, 5, 2) in a range of numbers. It explains in detail how and why the calculation is done, with each step clearly explained and specific examples given. Below we analyse the advantages and disadvantages of this explanation:

Pros:

Thorough and clear: The explanation explains in detail the process and reasons for calculating the number of times the numbers 0, 5 and 2 occur in the range 1 to n. In this way, the reader is able to understand exactly how the calculations are done and the principles behind them.

Providing examples: The explanation gives specific examples to help the reader better understand the calculation process and results.

Computational complexity analysis: the explanation mentions the time complexity of each computational step, which is very useful to understand the efficiency of the algorithm.

Disadvantages:

Lack of context: although the explanation explains the calculation in detail, it does not provide contextual information about this code, i.e. we don't know why we are calculating the number of 0, 5, and 2, and how the result of this calculation will be used.

Possible confusion: The explanation uses some mathematical notation (e.g., [n/5], [n/5^2], etc.) but does not explain the meaning of this notation, which may be confusing to readers who are unfamiliar with this notation.

43333 3.2

MergeLists {

/\* Here is the explanation for the code above:  
1. We need to define a head node, and a pre node which points to the head node. The reason is that we need to modify the linked list, but we still need to return the head node.  
2. We need to compare the first element of l2 with the first element of the linked list. If l2.val is smaller than the first element of the linked list, we need to insert l2 to the linked list. Otherwise, we need to find the proper position to insert l2. If we find the end of the linked list, then we need to insert l2 to the end of the linked list.  
3. We need to move the pre node to the next position.  
4. We need to move the l2 node to the next position. \*/

The goal of this code explanation is to describe a process that combines two sorted linked tables into a new ordered linked table. It details how the comparison and insertion operations are performed on the chained table elements under different conditions. The following is an analysis of the pros and cons of this explanation:

Pros:

Clear structure: the logical structure of the explanation is clear and explains the steps of merging a linked table in a sequential manner, which helps in understanding the flow of execution of the code.

Explanation of important concepts: the explanation explains the definition of head node and advance node and their importance, which helps in understanding the working of the chain table.

Weaknesses:

Some of the steps are too vague: in the explanation, it is depicted that a suitable location needs to be found to insert l2, but it is not clearly stated how to find this location, which may make the reader confused.

Lack of examples: the explanation does not provide specific examples to demonstrate the process of chain table merging; sometimes, specific examples can help readers better understand this type of problem.

Overall, this explanation clearly describes the process and key concepts of chain table merging, but there are some details and examples that may need further additions and improvements.

55555 5

SearchSpanSortedArray

/\* Here is the explanation for the code above:  
1. Find middle point mid = (l + h)/2  
2. If key is present at middle point, return mid.  
3. Else If arr[l..mid] is sorted  
 a) If key to be searched lies in range from arr[l]  
 to arr[mid], recur for arr[l..mid].  
 b) Else recur for arr[mid+1..h]  
4. Else (arr[mid+1..h] must be sorted)  
 a) If key to be searched lies in range from arr[mid+1]  
 to arr[h], recur for arr[mid+1..h].  
 b) Else recur for arr[l..mid] \*/

The goal of this code explanation is to describe a process for searching for keywords in a partially sorted (i.e., array rotated) array. The following is an analysis of the pros and cons of this explanation:

Pros:

Clear steps: the explanation makes clear the process of searching for a keyword, including finding the midpoint, comparing the value of the keyword to the midpoint, and how to recursively search in the left or right half of the array.

Case-by-case discussion: the explanation discusses each of the two cases in which the array is sorted to the left or to the right of the midpoint, which helps the reader understand the search strategy in the different cases.

Weaknesses:

Lack of background information: The explanation does not provide a detailed definition or description of "partially sorted arrays" or "rotated arrays," which may be difficult for readers who are not familiar with these issues.

Lack of examples: The explanation does not give concrete examples to demonstrate the search process, such as a rotated array and a search keyword.

55555 5

InvertTree

/\* Here is the explanation for the code above:  
1. for any node, we swap its left and right child.  
2. for the left child, we swap its left and right child  
3. for the right child, we swap its left and right child  
  
We can use a stack to store all the left and right child of a node.  
For example, we have a tree like this:  
 1  
 / \  
 2 3  
 / \ / \  
 4 5 6 7  
 / \  
 8 9  
  
Initially, we push 1 in the stack. The stack is [1]. Then we pop 1 out of the stack and swap its left and right child. The tree becomes:  
 1  
 / \  
 3 2  
 / \ / \  
 6 7 4 5  
 / \  
 8 9  
We push 2 and 3 in the stack. The stack is [2, 3]. Then we pop 3 out of the stack and swap its left and right child. The tree becomes:  
 1  
 / \  
 3 2  
 / \ / \  
 7 6 4 5  
 / \  
 8 9  
We push 6 and 7 in the stack. The stack is [2, 6, 7]. Then we pop 7 out of the stack and swap its left and right child. The tree becomes:  
 1  
 / \  
 3 2  
 / \ / \  
 7 6 4 5  
 / \  
 9 8  
We push 4, 5, 6 in the stack. The stack is [2, 6, 5, 4]. Then we pop 4 out of the stack and swap its left and right child. The tree becomes:  
 1  
 / \  
 3 2  
 / \ / \  
 7 6 5 4  
 / \  
 9 8  
We push 8, 9 in the stack. The stack is [2, 6, 5, 9, 8]. Then we pop 8 out of the stack and swap its left and right child. The tree becomes:  
 1  
 / \  
 3 2  
 / \ / \  
 7 6 5 4  
 / \  
 9 8  
  
We push 9 in the stack. The stack is [2, 6, 5, 9]. Then we pop 9 out of the stack and swap its left and right child. The tree becomes:  
 1  
 / \  
 3 2  
 / \ / \  
 7 6 5 4  
 / \  
 8 9  
The stack is empty now, so the algorithm ends here. \*/

Binary Tree Mirror Reversal

Strengths: The process of using a stack to store binary tree nodes and how to swap left and right child nodes is explained in detail with concrete examples.

Weaknesses: A more detailed explanation of why you chose to use a stack and how it works may be needed.

55554 4.8

LowestCommonAncestor

/\* Here is the explanation for the code above:  
1. if root is null, then it means we have reached the end of the tree and we return null  
2. if root is either p or q, then we return root because we know that the other node is in the subtree of this root  
3. if root is neither p nor q, then we recursively search for p and q in the left and right subtree  
4. if both left and right are not null, then it means that p and q are in different subtrees, so we return root  
5. if either left or right is null, then it means that both p and q are in the same subtree, so we return the one that is not null \*/

Finding the nearest common ancestor of a binary tree

Strengths: Clearly describes the process of recursive search and how to determine the common ancestor by examining the subtree.

Weaknesses: may need to explain in more detail how to determine the common ancestor and why the common ancestor must be in the subtree.

55555 5

MaxDepth

/\* Here is the explanation for the code above:  
1. We need to find the depth of the tree, so we need to return the max value of the depth of the left subtree and the right subtree.  
2. We use recursion to find the depth of the tree.  
3. The recursion has a base case, which is when the root is null, we return 0.  
4. Otherwise, we calculate the depth of the left subtree and the right subtree, and return the max value of them.  
5. In the recursion, we use a variable to record the depth of the left subtree and the right subtree, and we need to add them by 1, because the root is not null.  
6. At last, we return the max value of the depth of the left subtree and the right subtree plus 1. \*/

Calculate the maximum depth of a binary tree

Strengths: There is a clear description of the process of recursively calculating depth, and how to determine the depth of a tree by comparing the depths of the left and right subtrees.

Weaknesses: The principle of recursive depth calculation may need to be explained in more detail, including the termination condition of recursion, the transfer of data during recursion, etc.

55555 5

Merge2Lists

/\* Here is the explanation for the code above:  
1. The base cases are when either list is null. Then there's nothing to merge, so you just return the other non-null list.  
2. Otherwise, you compare the heads of the two lists, and add the smaller one to the merged list. The next element of the merged list is then set to the merge of the lists that didn't contribute the head.  
3. Finally, you return the merged list. \*/

Merge two ordered linked tables

Strengths: There is a detailed explanation of how to compare and add nodes and how to merge linked lists recursively.

Weaknesses: may need a more detailed explanation of why recursive merging is preferred over iteration.

55555 5

RemoveLeafNodes

/\* Here is the explanation for the code above:  
1. We need to go to the bottom of the tree first, then go up to the root.  
2. So we use post-order traversal.  
3. When we reach a leaf node, we check whether its value is equal to target.  
4. If it is equal to target, we return null, which means that this node should be removed.  
5. If it is not equal to target, we return this node.  
6. When we return a non-null value, we need to assign it to the left or right child of its parent node.  
7. When we assign the value to the left or right child of its parent node, we need to check whether the left or right child is null.  
8. If the left or right child is null, we need to assign null to the left or right child of the parent node.  
9. Otherwise, we do nothing.  
10. After we traverse all the nodes, we will return the root node of the tree. \*/

Deleting Nodes in a Binary Tree

Strengths: explains in detail how to find and delete the target node via a backward traversal and how to reconnect the parent nodes of the deleted node.

Weaknesses: A more detailed explanation may be needed as to why a backward traversal is chosen and how to determine which nodes need to be deleted.

55554 4.8

SymmetricBinaryTree

/\* Here is the explanation for the code above:  
1. Initially, the algorithm checks if the root node is null. If so, then we conclude that the tree is symmetric. Otherwise, we call the recursive helper function isMirror.  
2. The isMirror function takes two TreeNode objects as arguments. The function checks if the two TreeNode objects are null. If so, the function returns true. If not, the function checks if the values of the TreeNode objects are equal. If not, the function returns false. Otherwise, the function returns the result of a recursive call to isMirror. The two recursive calls are made with the following arguments: the left subtree of the left TreeNode object and the right subtree of the right TreeNode object; the right subtree of the left TreeNode object and the left subtree of the right TreeNode object. \*/

Determine if a binary tree is symmetric

Pros: explains in detail how to determine if a binary tree is symmetric by comparing left and right subtrees.

Weaknesses: A more detailed explanation of how to determine the conditions for binary tree symmetry and how to design a recursive function may be needed.

55555

Brackets

/\* Here is the explanation for the code above:  
1. As we can see the recursion tree, we can think about the base case. In this case, it is when the length of the string is equal to 2\*n.  
2. Then we can think about the recursion rule. In this case, it is when to add "(" or ")".  
3. Then we can think about the condition to add "(". In this case, it is when the number of "(" is smaller than n.  
4. Then we can think about the condition to add ")". In this case, it is when the number of "(" is larger than the number of ")". \*/

Generating Valid Parentheses

Pros: explains in detail how to generate all possible bracket combinations recursively, and how to determine whether a bracket combination is valid.

Weaknesses: A more detailed explanation of why recursive generation was chosen over other methods may be needed.

55455 4.8

CombinationSum

/\* Here is the explanation for the code above:  
1. Sort the candidates;  
2. Use HashSet to avoid duplicate result;  
3. Use start to avoid duplicate result;  
4. Use target < 0 to avoid unnecessary computation. \*/

Find all possible combinations from the candidate array whose sum is equal to the target number

Strengths: Clear explanation of how to use HashSet to prevent duplicate results, and how to use sorting and start conditions to avoid unnecessary calculations.

Cons: Further explanation may be needed on how to combine these steps to form a complete solution.

34334 3.5

RegularExpressionMatching

/\* Here is the explanation for the code above:  
1. If a star is present in the pattern, it will be in the second position pattern[1].  
Then, we may ignore this part of the pattern, or delete a matching character in the text.  
If we have a match on the remaining strings after any of these operations, then the initial inputs matched.  
  
2. If the pattern[1] is not a star, then we must match the current character of the text to  
that of the pattern. Again, if there is a match, we proceed. Otherwise, we return false.  
  
The base cases of the recursion are when the length of the pattern is 0 or when the length  
of the pattern is 1 and isn't followed by a star. In both of these cases, we simply check  
if the lengths of the text and pattern are equal. If they are, we have a match on our hands! \*/

Regular Expression Matching

Strengths: There is a detailed discussion of how to handle asterisks and matching characters, and a detailed explanation of the basic case for recursion.

Weaknesses: more explanation may be needed on how regular expressions work and how to handle other special characters such as the dot.

4.5 4.5 5 4.5 4 4.5

Calculator

/\* Here is the explanation for the code above:  
1. It uses two stack to store the numbers and operations, respectively.  
2. It uses a variable temp to store the number which is not splited by space.  
3. It uses a variable n to store the length of the input string.  
4. For the for loop, it checks if the current character is a space. If it is, continue the loop. Otherwise, it checks if the current character is a number. If it is, it use the variable temp to store the number. Otherwise, it checks if the current character is an operation. If it is, it checks the top operation of the operation stack. If the top operation is a left parenthesis, it will push the current operation into the operation stack. Otherwise, it will pop the top operation of the operation stack, and pop two number from the number stack, and calculate the result and push the result into the number stack. It will do the operation until the top operation of the operation stack is a left parenthesis. Then it will push the current operation into the operation stack. Otherwise, it checks if the current character is a left parenthesis. If it is, it will push the current operation into the operation stack. Otherwise, it will pop the top operation of the operation stack. If the operation is a left parenthesis, it will stop popping. Otherwise, it will pop two number from the number stack, and calculate the result and push the result into the number stack. It will do the operation until the top operation of the operation stack is a left parenthesis. Then it will pop the top operation of the operation stack.  
5. After the for loop, it will check if the variable temp is not -1. If it is not -1, it will push the temp into the number stack.  
6. After that, it will check if the operation stack is not empty. If it is not empty, it will pop the top operation of the operation stack. Then it will pop two number from the number stack, and calculate the result and push the result into the number stack. It will do the operation until the operation stack is empty.  
7. Finally, it will return the top element of the number stack. \*/

Simple calculator

Strengths: Clear explanation of how to use two stacks to store numbers and operations, and how to handle spaces and numbers.

Weaknesses: may need a more detailed explanation of how to handle various operations (e.g., addition, subtraction) and how to handle parentheses.

3.5 4.5 5 4 3 4.0

Calculator2

/\* Here is the explanation for the code above:  
1. The variable n stores the number of consecutive digits.  
2. The variable operand stores the operand that is being built from consecutive digits.  
3. The stack stores the operands and the signs. It is a stack of Objects.  
 When we see a number, we keep pushing it to the stack.  
 When we see a sign, we pop one number from the stack and do the calculation.  
 Therefore, when we see a sign, the top of the stack is always a number.  
4. The function evaluateExpr evaluates the expression value until the next closing bracket.  
 The idea is as follows:  
 - We keep a stack of numbers (integer) and signs (character) for each opening bracket.  
 - When we see a closing bracket, we start popping the numbers and signs from the stack,  
 until we reach the corresponding opening bracket.  
 We then get the sum of the popped numbers, update the stack with the new sum,  
 and continue to calculate the rest of the expression.  
5. We use a while loop to iterate over the expression.  
 For each character, there are two cases:  
 - The character is a digit:  
 We update the operand: operand = operand \* 10 + (int) ch - '0'.  
 - The character is a sign (‘+’ or ‘-‘) or a closing bracket ‘)’:  
 We evaluate the expression to the next closing bracket,  
 by calling the function evaluateExpr.  
 We then update the result and the sign:  
 - res += sign \* operand, where sign = 1 if the sign is ‘+’ and sign = -1 if the sign is ‘-‘.  
 - If the character is ‘)’, we break the while loop.  
6. Finally, we return the result. \*/

This comment provides a detailed description of the code, explaining what the variables in the code do and how the function works. It also explains how values and symbols are handled in expressions using the stack, and how expressions are handled and evaluated to the next closing parenthesis through the function evaluateExpr. It then explains how the operands are updated and symbols are handled in the case of each character.

Pros:

Detail: comments explain every part of the code in detail, including what the variables do and how the function works.

Clarity: The comments clearly explain how the code works by giving examples and detailed descriptions of how the code works.

Logic: comments clearly describe the logic of the code, how values and symbols are handled, and how the various parts of an expression are handled.

Disadvantages:

Overly Complex: The description of the annotations can be overly complex and may take some time and effort to understand. For people without a computer background, they may find it difficult to understand.

Lack of intuition: although the annotations are thorough, they do not provide intuitive visual aids, such as pseudo-code or flowcharts, which may make understanding difficult.

Lack of code examples: The comments do not provide actual code examples, which may make understanding more difficult, especially for complex expressions and functions.

Possible redundancy: Some descriptions may be too detailed, which may seem redundant to someone who already understands the code.

4.5 5 5 4.5 4 4.6

LongestValidBrackets

/\* Here is the explanation for the code above:  
1. Push -1 into the stack to mark the end of the previous valid substring.  
2. Iterate over the string, if current character is '(', push index into stack.  
3. If current character is ')', pop from stack. If stack is not empty, then update the max length, current index minus top of stack.  
4. If stack is empty, push current index into stack to mark the end of the current valid substring. \*/

This comment describes an algorithm that uses the stack to process strings. As it traverses the string, it keeps track of and processes valid substrings (possibly parenthesis-matched substrings) in the string. The key point of this algorithm is the way the stack is handled: when "(" is encountered, the index is pushed into the stack; when ")" is encountered, it is popped off the stack and the maximum length is updated.

Pros:

Succinctness: this comment is concise and explains how the entire code works in just four steps.

Clarity: the comment describes the use of the stack in a clear way, including when and why elements are pushed and popped.

Logic: the comments are clear about the logical steps of the code, enabling the reader to understand the flow of the algorithm.

Disadvantages:

Lack of detail: comments may be too concise for some complex logical sections and do not provide enough detailed information, which may make it difficult for some readers to understand.

Unclear context: comments do not explain the context or purpose of the code, making it possible for the reader to not understand what the code is used for.

Lack of code examples: Like the previous comment, this comment does not provide actual code examples, which may make it difficult for readers to understand the correspondence between the comment and the code.

55555 5

MaxQueue

/\* Here is the explanation for the code above:  
1. The queue is the original queue, which stores the elements.  
2. The max is the queue that stores the max value of the original queue.  
3. The max queue is a monotonic queue, which means the elements in the queue are in ascending order.  
4. When we push an element to the original queue, we need to find the right position for it in the max queue. So we should pop the elements in the max queue from the end until the last element is larger than the element we are going to push.  
5. When we pop an element from the original queue, we need to check whether the element is the largest element in the max queue. If it is, we should pop it from the max queue. \*/

This comment describes a data structure that uses a primitive queue and a maximum value queue. The primitive queue is used to store the elements and the maximum queue is used to store the maximum value of the primitive queue, which is a monotonic queue, i.e., the elements in the queue are sorted in ascending order. When adding elements to or popping elements out of the original queue, the maximum value queue needs to be updated accordingly.

Pros:

Clarity: The annotation clearly defines the role and characteristics of each queue and explains the relationship between the original queue and the maximum queue.

Detailed: the annotations explain in detail the process of each operation (push and pop) so that the reader understands how to maintain the maximum value queue.

Logical: The annotations present the flow of the algorithm step-by-step, which is logical and easy to understand.

Disadvantages:

Lack of context: although the annotation explains how the code works, it fails to describe the specific application scenario or purpose of the code, which may make the reader's understanding of the context of the code unclear.

Lack of code examples: the comment does not provide specific code examples, which may make the reader encounter difficulties in understanding the specific details of the code implementation.

Over-specialisation: For non-specialist readers, some concepts (e.g. monotonic queues) may require additional explanation to help them better understand the code.

55555 5

MinStack

/\* Here is the explanation for the code above:  
1. If the stack is empty, push the number into the stack, and push the number again into the stack.  
2. If the stack is not empty, compare the number with the top of the stack, if it is greater than the top, push the top again into the stack. If it is smaller, push the number into the stack.  
3. When pop the element, pop twice. The first pop is to pop the top of the stack, the second one is to pop the min element.  
4. When peek the element, the second top element is the top element in the stack. \*/

This comment is an explanation of a piece of code that uses a stack to process data. The stack appears to be designed to push or pop two elements at a time, one to process the top element of the stack and one to process the smallest element. This design may be used to get the smallest element of the stack in O(1) time complexity while maintaining normal stack operations (push, pop, peek).

Pros:

Succinctness: the annotations are concise and explain the stack operations in a very efficient way.

Clarity: the annotations clearly explain the process of stack operations, including push, pop, and peek operations.

Effectiveness: the annotations explain how to efficiently store and retrieve the smallest element of the stack.

Weaknesses:

Lack of Context: annotations do not provide the context of the code, such as the primary use of the code, or the role of this code within a larger program.

Expertise: the comment may be difficult to understand for someone without a background in computer science, as it assumes that the reader is already familiar with the operation of the stack.

Lack of code examples: As with the previous example, this comment does not provide actual code examples, which may make understanding more difficult.

44445 4.2

RemoveDuplicateLetters

/\* Here is the explanation for the code above:  
1. scan the string from left to right, use stack to store the characters,  
2. for each character, if it is already in the stack, skip it;  
3. if the current character is smaller than the top character of the stack,  
and the top character of the stack exists in the rest of the string,  
pop the stack to remove the top character,  
4. push the current character to the stack.  
5. after scanning, pop the stack to form the result string. \*/

This comment describes in detail a specific string processing algorithm that primarily applies the data structure of the stack. The algorithm works by primarily scanning the string, storing characters on the stack, while removing or skipping certain characters based on specific rules. The goal of the algorithm may be to generate a specific result string, such as a dictionary-ordered minimal string.

Pros:

Clarity: comments clearly explain how the code works, including the logic and goal of each step.

Detailed: comments explain each step in detail, which will help the reader better understand how the code works.

Structure: the annotations are neatly structured and clearly organised, making it easier for the reader to understand the logic of the code.

Disadvantages:

Lack of context: while the comments explain how the code works, they do not explain the actual use of the code or its application in a larger project.

Lack of code examples: comments do not provide specific code snippets, which can make it difficult for readers to understand the code.

Expertise: Additional explanations and examples may be needed for non-computer science readers to help them understand the concepts of stack and string handling.

55555 5

ValidBrackets

/\* Here is the explanation for the code above:  
1. Push character into stack if it's open parentheses.  
2. If it's close parentheses, pop from stack and compare with it.  
3. If not same, return false.  
4. If stack is empty, return true.  
5. Else return false. \*/

This comment is an explanation of a code that uses the stack to handle the parenthesis matching problem. The code works by iterating over each character in the string, pushing it onto the stack if the character is an open bracket, and popping the element off the stack and comparing it to it if the character is a closed bracket. If the two do not match, then return false; if the stack is empty after traversal, then return true; otherwise return false.  
  
Advantages:  
  
Succinctness: the annotations are succinct and explain how the entire code works in just five steps.  
  
Clarity: the comments describe the use of the stack in a clear way, including when and why elements are pushed in and popped out.  
  
Logic: the comments are clear about the logical steps of the code, enabling the reader to understand the flow of the algorithm.  
  
Disadvantages:  
  
Lack of detail: comments may be too concise for some complex logical sections and do not provide enough detailed information, which may make it difficult for some readers to understand.  
  
Unclear context: the comment does not explain the context or purpose of the code, making it possible for the reader to not understand what the code is used for.  
  
Lack of code examples: This comment also does not provide actual code examples, which may make it difficult for readers to understand the correspondence between the comment and the code.  
55455 4.8

DelineateLetterRange

/\* Here is the explanation for the code above:  
1. We need an array to store the last index of each char;  
2. We need one variable to store the end index of the current sub string;  
3. We need one variable to store the start index of the current sub string;  
4. We need one arraylist to store the length of each partition.  
  
The loop is to traverse the string and update the end index of the current partition. If i == end, then we get one partition. \*/

This comment is an explanation of code for a string partitioning problem. The comment explains in detail the data structures used in the code and what they are used for, and also explains that the main purpose of the loop is to traverse the string and update the end index of the current partition. If the current index i equals the ending index, a partition is found.

Pros:

Clarity: the comments clearly explain each variable and data structure used in the code, making it easy for the reader to understand what each part does.

Detailed: The comments explain the logic of the loop in detail so that the reader can understand the main operation of the code.

Logic: the comments explain the running process of the code in order, so that the reader can understand the logic of the code in order.

Disadvantage:

Lack of context: although the comment explains the operation of the code, it does not explain the specific application scenario or purpose of the code, which may make it difficult for the reader to understand the context of the code.

Expertise: this comment requires the reader to have some understanding of programming and specific data structures, which may be more difficult for non-expert readers to understand.

Lack of code examples: This comment does not provide specific code examples, which may make it difficult for the reader to understand the specific details of the code implementation.

55445 4.6

ZTransfer

/\* Here is the explanation for the code above:  
1. We need to consider the special cases that numRows = 1 and numRows = 2.  
2. We need to find the relationship between the index of the characters in the original string and the index of the characters in the ZigZag string.  
3. For the first and the last row, the characters' indexes in the original string are arithmetic sequence with the common difference of 2 \* (numRows - 1).  
4. For the other rows, the characters' indexes in the original string are arithmetic sequence with the common difference of 2 \* (numRows - 1 - i) and 2 \* i, respectively.  
5. We can find the corresponding characters in the original string according to the indexes in the ZigZag string and append them to the ZigZag string. \*/

This comment explains a piece of code that implements a "ZigZag" string conversion. This conversion usually involves the indexing of characters in the original string and in the converted string, with the special case of 1 or 2 lines to be handled.

Advantages:

Clarity: comments clearly describe the workings of the code, explaining the relationships between character indices and how to find the appropriate character based on these relationships.

Exhaustive: comments consider special cases in detail, such as when the number of lines is 1 or 2.

Logical: The comments are well organised and explain the code in the order in which it is executed, helping the reader to better understand the logic of the code.

Disadvantage:

Lack of context: although the comment explains how the code works, it does not explain the scenario or purpose for which this function is used.

Expertise: The comment uses some technical terms, such as "arithmetic sequence", which may be difficult for some non-computer science readers to understand.

Lack of code examples: The comment does not provide specific code examples, which may make it difficult for readers to understand the code.

55554 4.8

ProducerConsumer

///\* Here is the explanation for the code above:  
//1. The lock is initialized to a ReentrantLock object, and the condition variable is initialized to a condition object of the lock, which is equivalent to creating a queue of threads waiting for the condition variable.  
//2. Producer and Consumer implement the Runnable interface, and the Producer and Consumer threads are created by creating two threads.  
//3. When the producer produces, first judge whether the queue is full, if it is full, wait for the consumer to consume, then release the lock, and then wait for the consumer to consume, if it is not full, then the producer produces, count++, and then signal the consumer to consume.  
//4. When the consumer consumes, first judge whether the queue is empty. If it is empty, wait for the producer to produce, then release the lock, and then wait for the producer to produce. If it is not empty, then the consumer consumes, count--, and then signal the producer to produce.  
//5. The main function creates 5 producers and 5 consumers, which are executed in sequence according to the order of the threads. \*/

This comment describes a piece of code that implements the producer-consumer model. This model is common in multithreaded programming and is used to solve synchronisation problems between threads. In this code, the producer is responsible for generating data and putting it into a queue, and the consumer is responsible for fetching and processing data from the queue.

Pros:

Clarity: the comments are clear and describe the overall logic of the code and the function of each part.

Detailed: comments explain in detail how producers and consumers work and how they interact.

Logic: comments describe the execution of the code in order, enabling the reader to understand the logical flow of the code.

Disadvantage:

Unclear context: comments do not explain the context or purpose of the code, making it possible for the reader to not understand what the code is used for.

Expertise: There is some jargon in the comment, such as "ReentrantLock" and "condition variable", which may be difficult to understand for readers who are not familiar with concurrent programming.

Lack of code samples: This comment does not provide actual code samples, which may make it difficult for readers to understand the correspondence between the comment and the code.

55554 4.8

TreeTraversal

//\* 1. put root in stack  
// \* 2. if stack is not empty, pop one node and print its value  
// \* 3. push its right child, if it has one  
// \* 4. push its left child, if it has one  
// \* 5. repeat 2-4 \*/

This comment is an explanation of a code that implements depth-first search (DFS) of trees, specifically for prior order traversal (root-ish). This is a basic and important data structure operation.

Pros:

Succinctness: the annotations clearly describe the entire operation in short language that is easy to understand.

Logic: the comment describes the steps in detail and in order so that the reader can understand the execution of the code smoothly.

Clarity: the comment clearly explains the operation of each step, without using too professional or vague terms.

Weaknesses:

Lack of context: the annotations do not provide information about the context of the code, how it deals with which type of tree (binary, multinomial, etc.) and why a depth-first search is needed.

Lack of detail: although the comment explains the basic operation of the code, it does not explain how to handle some special cases, for example, how the code should be executed if the tree is empty or has only one node.

Lack of code examples: The comment does not give specific code snippets, which may make it difficult for the reader to relate the comment to actual code.

55555 5