

QUESTION BANK DOCKET

**Table of Contents**

[1 Source 3](#_Toc253285289)

[2 Category 3](#_Toc965934774)

[3 Tech Area 3](#_Toc613746458)

[4 Complexity 3](#_Toc904143571)

[5 Question 3](#_Toc1426514880)

[6 Answer 6](#_Toc441207452)

[7 References 6](#_Toc1838997797)

# Source

HackerRank

# Category

C#

# Tech Area

Coding

# Complexity

Simple

# Question

Write an *HTTP GET* method to retrieve information from a movie database concerning how many movies have a particular string in their title.  Given a search term, query *https://jsonmock.hackerrank.com/api/moviesdata/search/?Title=[substr].* The query response will be a JSON object with the following five fields:

* *page*: The current page.
* *per\_page*: The maximum number of results per page.
* *total*: The total number of movies having the substring *substr* in their title.
* *total\_pages*: The total number of pages which must be queried to get all the results.
* *data*: An array of JSON objects containing movie information where the *Title* field denotes the title of the movie.

The function will return the integer value found in the *total* field in the returned JSON object.

**Function Description**

Complete the function *getNumberOfMovies* in the editor below.

getNumberOfMovies has the following parameter(s):

*str substr:*  the string to search for in the movie database

**Returns**

*int:* the value of the total field in the returned JSON object

**Constraints**

* *0 < |substr| < 20*

Input Format for Custom Testing

Sample Case 0

Sample Input 0

STDIN      Function

-----      --------

maze   →   substr = 'maze'

Sample Output 0

37

Explanation 0

The value of *substr* is *maze*, so our query is *https://jsonmock.hackerrank.com/api/moviesdata/search/?Title=maze* and the response is:

{

  "page": 1,

  "per\_page": 10,

  "total": 37,

  "total\_pages": 4,

  "data": [

    {

      "Title": "The Maze Runner",

      "Year": 2014,

      "imdbID": "tt1790864"

    },

    {

      "Title": "Maze Runner: The Scorch Trials",

      "Year": 2015,

      "imdbID": "tt4046784"

    },

    {

      "Title": "Into the Grizzly Maze",

      "Year": 2015,

      "imdbID": "tt1694021"

    },

    {

      "Title": "Hercules in the Maze of the Minotaur",

      "Year": 1994,

      "imdbID": "tt0110018"

    },

    {

      "Title": "The Crystal Maze",

      "Year": 1990,

      "imdbID": "tt0098774"

    },

    {

      "Title": "The Maze",

      "Year": 2010,

      "imdbID": "tt1675758"

    },

    {

      "Title": "Maze",

      "Year": 2000,

      "imdbID": "tt0246072"

    },

    {

      "Title": "Iron Maze",

      "Year": 1991,

      "imdbID": "tt0102128"

    },

    {

      "Title": "The Maze",

      "Year": 1953,

      "imdbID": "tt0046057"

    },

    {

      "Title": "Maze Runner: The Burn Trials",

      "Year": 2015,

      "imdbID": "tt4844320"

    }

  ]

}

Return the value of the *total* field, 37, as the answer.

# Answer

# References

HackerRank

# Source

HackerRank

# Category

C#

# Tech Area

Coding

# Complexity

Simple

# Question

Query a REST API to get a list of articles. Given an integer, *limit*, return the top *limit* article names ordered decreasing by comment count, then decreasing alphabetically for those that have the same comment counts.

To access the collection of comments, make an HTTP GET request to:

https://jsonmock.hackerrank.com/api/articles?page=<pageNumber>

where <pageNumber> is an integer where *1 <= pageNumber <= total\_pages. total\_pages* is one of the fields in the JSON data.

The response is a JSON object with the following 5 fields:

* page: The current page of the results
* per\_page: The maximum number of records returned per page.
* total: The total number of records on all pages of the result.
* total\_pages: The total number of pages with results.
* data: An array of objects containing records returned on the requested page

Each record in *data* has the following schema.

* title: the title of the article, may be null
* url: the URL of the article
* author: the username of the author of the article
* num\_comments: the number of comments the article has, may be null (no comments)
* story\_id: identifier of the story related to the article, may be null
* story\_title: the title of the story related to the article, may be null
* story\_url: the URL of the story related to the article, may be null
* parent\_id: identifier of the parent of the article,  may be null
* created\_at: the date and time the record was created

First get the article name.

* If the *title* field is not null, use *title*.
* Otherwise, if the *story\_title* field is not null, use *story\_title.*
* If both fields are null, ignore the article.

Sort the titles decreasing by comment count, then decreasing alphabetically by article name if there is a tie in comments count. Return a list of the top *limit* names.

**Function Description**

Complete the function *topArticles* in the editor below.

*topArticles* has the following parameter(s):

*int limit*: the number of articles to return

**Returns**

*string[k]:* the names of articles

Input Format For Custom Testing

Sample Case 0

**Sample Input For Custom Testing**

2

**Sample Output**

UK votes to leave EU

F.C.C. Repeals Net Neutrality Rules

**Explanation The limit value is 2 so return the names of the top two articles based on the number of comments. Those top articles are:**

1. title: F.C.C. Repeals Net Neutrality Rules, story\_title: null, num\_comments: 1397
2. title: UK votes to leave EU, story\_title: null, num\_comments: 2531

Their names are their titles because they are not null. The second of these articles has more comments, so it comes first. There is not a tie for comment count so there is no change from the secondary sort.

# Answer

# References

HackerRank

# Source

HackerRank

# Category

C#

# Tech Area

Coding

# Complexity

Simple

# Question

Given an array of integers, without reordering, determine the maximum difference between any element and any prior smaller element.  If there is never a lower prior element, return -1.

**Example**

*arr = [5, 3, 6, 7, 4]*

There are no earlier elements than *arr[0]*.

There is no earlier reading with a value lower than *arr[1].*

There are two lower earlier readings with a value lower than *arr[2] = 6:*

* *arr[2] - arr[1] = 6 - 3 = 3*
* *arr[2] - arr[0] = 6 - 5 = 1*

There are three lower earlier readings with a lower value than *arr[3] = 7:*

* *arr[3] - arr[2] = 7 - 6 = 1*
* *arr[3] - arr[1] = 7 - 3 = 4*
* *arr[3] - arr[0] = 7 - 5 = 2*

There is one lower earlier reading with a lower value than *arr[4] = 4:*

* *arr[4] - arr[1] = 4 - 3 = 1*

The maximum trailing record is *arr[3] - arr[1] = 4.*

**Example**

*arr = [4, 3, 2, 1]*

No item in *arr*has a lower earlier reading, therefore return*-1*

**Function Description**

Complete the function *maximumTrailing* in the editor below.

*maximumTrailing* has the following parameter(s):

*int* *arr[n]:*  an array of integers

**Returns:**

*int:* the maximum trailing difference*,* or *-1* if no element in *arr* has a lower earlier value

**Constraints**

* *1 ≤ n ≤ 2 × 105*
* *−106 ≤ arr[i] ≤ 106*and  0*≤ i < n*

Input Format For Custom Testing

Input from stdin will be processed as follows and passed to the function:

The first line contains a single integer, *n*, the number of elements in the array *arr*.

Each of the *n* subsequent lines contains a single integer, each an element *arr[i]* where *0 ≤ i < n*.

Sample Case 0

**Sample Input 0**

STDIN         Function

**-----         --------**

7**→** arr[] size n = 7

2**→**arr = [2, 3, 10, 2, 4, 8, 1]

3

10

2

4

8

1

**Sample Output**

8

**Explanation**

Differences are calculated as:

* *3 - [2] = [1]*
* *10 - [3, 2] = [7, 8]*
* *4 - [2, 3, 2] = [2, 1, 2]*
* *8 - [4, 2, 3, 2] = [4, 6, 5, 6]*

The maximum trailing difference is *10 - 2 = 8.*

Sample Case 1

**Sample Input 1**

STDIN         Function

**-----         --------**

6**→** arr[] size n = 6

7**→**arr = [7, 9, 5, 6, 3, 2]

9

5

6

3

2

**Sample Output**

2

**Explanation**

Differences are calculated as:

* *9 - [7] = 2*
* *6 - [5] = 1*

The maximum trailing difference is *2.*

# Answer

# References

HackerRank

# Source

HackerRank

# Category

C#

# Tech Area

Coding

# Complexity

Simple

# Question

Given an array of integers, change it in such a way that it follows a zig-zag pattern. A zig-zag array is one where for each integer, its adjacent integers are both greater than or less than itself. In other words, using L to mean a lower value and H to mean higher, the array follows either the pattern [L,H,L,H...] or [H,L,H,L...]. To make the array a zig-zag array, you can replace any element with any other integer (positive, negative, or zero). What is the minimum number of replacements required to accomplish this?

**Example**

*arr = [1, 2, 3, 4, 5]*

Original: [1, 2, 3, 4, 5]

LHLHL: [1, 2, -, 4, -]

HLHLH: [+, 2, 3, -, 5]

To achieve an array starting with a low value, both the 3 and the 5 need to be reduced to any value less than 2 and 4 respectively.

To achieve an array starting with a high value, the 1 needs to be increased (any value > 2) and the 4 needs to be decreased (any value < 3)

In this case, creating either form of zig-zag array takes a minimum of 2 replacements, the final answer.

**Function Description**

Complete the function *minOperations* in the editor below.

minOperations has the following parameter:

    int *arr[n]:*  an array of integers

**Returns**

*int:* the minimum number of operations required to turn *arr* into a zig-zag array

**Constraints**

* 1 ≤ *n* ≤ 105
* 1 ≤ *arr[i]* ≤ 109

Input Format For Custom Testing

The first line contains an integer, *n*, the number of elements in *arr*.

Each line *i* of the *n* subsequent lines (where *0 ≤ i < n*) contains an integer, *arr[i]*.

Sample Case 0

**Sample Input For Custom Testing**

STDIN     Function

-----     --------

8     → n = 8

2     → arr = [2, 1, 2, 3, 4, 5, 2, 9]

1

2

3

4

5

2

9

**Sample Output**

2

**Explanation**

Original: [2, 1, 2, 3, 4, 5, 2, 9]

  L H L H L H L H

LHLHLHLH: [2, +, 2, 3, -, 5, 2, 9]

           H L H L H L H H

HLHLHLHL: [2, 1, 2, -, 4, -, 2, -]

For the LHLH... pattern, replace the second value (1) with a number greater than 2 and the fifth value (4) with a number less than 3.

For the HLHL... pattern, replace the fourth value (3) with a number less than 2, and the sixth value (5) and the eighth value (9) with a number less than 2.

The LHLH... pattern only requires two replacements.

Sample Case 1

**Sample Input For Custom Testing**

STDIN     Function

-----     --------

6    →    arr[] size n = 6

1    →    arr = [1, 2, 4, 4, 5, 6]

2

4

4

5

6

**Sample Output**

2

**Explanation**

Original: [1, 2, 4, 4, 5, 6]

  L H L H L H

LHLHLHLH: [1, 2, -, 4, -, 6]

           H L H L H L

HLHLHLHL: [+, 2, 4, -, 5, -]

Starting with a low value takes 2 replacements, while starting with a high value takes 3. Return 2.

# Answer

# References

HackerRank

# Source

HackerRank

# Category

C#

# Tech Area

Coding

# Complexity

Simple

# Question

An automated cutting machine is used to cut rods into segments. The cutting machine can only hold a rod of *minLength* or more. A rod is marked with the necessary cuts and their lengths are given as an array in the order they are marked. Determine if it is possible to plan the cuts so the last cut is from a rod at least *minLength* units long.

**Example**

*n = 3*

*lengths = [4, 3, 2]*

*minLength = 7*

The rod is initially *sum(lengths) = 4 + 3 + 2 = 9* units long. First cut off the segment of length *4 + 3 = 7* leaving a rod *9 - 7 = 2.*  Then check that the length *7* rod can be cut into segments of lengths *4* and *3.* Since *7* is greater than or equal to *minLength = 7,* the final cut can be made. Return *"Possible".*

**Example**

*n = 3*

*lengths = [4, 2, 3]*

*minLength = 7*

The rod is initially *sum(lengths) = 4 + 2 + 3 = 9* units long. In this case, the initial cut can be of length *4* or *4 + 2 = 6.* Regardless of the length of the first cut, the remaining piece will be shorter than *minLength.* Because *n - 1* = 2 cuts cannot be made, the answer is "*Impossible*."

**Function Description**

Complete the function *cutThemAll* in the editor below.

*cutThemAll* has the following parameter(s):

*int lengths[n]:*  the lengths of the segments, in order

*int minLength:* the minimum length the machine can accept

**Returns**

*string:* "*Possible*" if all *n-1* cuts can be made. Otherwise, return the string "*Impossible*"

**Constraints**

* 2 ≤ *n* ≤ 105
* *1 ≤ t ≤ 109*
* *1 ≤ lengths[i] ≤ 109*
* The sum of the elements of *lengths* equals the uncut rod length.

Input Format For Custom Testing

The first line contains an integer, *n*, the number of elements in *lengths*.

Each line *i* of the *n* subsequent lines (where *0 ≤ i < n*) contains an integer, *lengths[i]*.

The next line contains an integer, *minLength*, the minimum length accepted by the machine.

Sample Case 0

**Sample Input For Custom Testing**

STDIN     Function

-----     --------

4     →   lengths[] size n = 4

3     →   lengths[] =  [3, 5, 4, 3]

5

4

3

9     →   minLength= 9

**Sample Output**

Possible

**Explanation**

The uncut rod is *3 + 5 + 4 + 3 = 15* units long. Cut the rod into lengths of *3 + 5 + 4 = 12* and *3.* Then cut the *12* unit piece into lengths *3* and *5 + 4 = 9*. The remaining segment is *5 + 4 = 9* units and that is long enough to make the final cut.

Sample Case 1

**Sample Input For Custom Testing**

STDIN     Function

-----     --------

3     →   lengths[] size n = 3

5     →   lengths[] =  [5, 6, 2]

6

2

12    →   minLength= 12

**Sample Output**

Impossible

**Explanation**

The uncut rod is *5 + 6 + 2 = 13* units long. After making either cut, the rod will be too short to make the second cut.

# Answer

# References

HackerRank

# Source

HackerRank

# Category

C#

# Tech Area

Coding

# Complexity

Simple

# Question

Rearrange an array of integers so that the calculated value *U* is maximized. Among the arrangements that satisfy that test, choose the array with minimal ordering. The value of *U* for an array with *n* elements is calculated as :

*U = arr[1]×arr[2]×(1÷arr[3])×arr[4]×...×arr[n-1] × (1÷arr[n])* if *n* is odd

*or*

*U = arr[1]×arr[2]×(1÷arr[3])×arr[4]×...×(1÷arr[n-1]) × arr[n]* if *n* is even

The sequence of operations is the same in either case, but the length of the array, *n,* determines whether the calculation ends on *arr[n]* or *(1÷arr[n]).*

Arrange the elements to maximize *U* so the items are in the numerically smallest possible order.

**Example**

*arr = [21, 34, 5, 7, 9]*

To maximize *U* and minimize the order, arrange the array as *[9, 21, 5, 34, 7]* so *U = 9 × 21 × (1÷5) × 34 × (1÷7) = 183.6*. The same *U* can be achieved using several other orders, e.g. *[21, 9, 7, 34, 5] = 21 × 9 × (1÷7) × 34 × (1÷5) = 183.6*, but they are not in the minimum order.

**Function Description**

Complete the function *rearrange* in the editor.

rearrange has the following parameter(s):

*int* *arr[n]:*  an array of integers

**Returns**

*int[n]:* the elements of *arr* rearranged as described

**Constraints**

* *1 ≤ n ≤ 105*
* *1 ≤ arr[i] ≤ 109*

Input Format For Custom Testing

The first line contains an integer, *n*, the number of elements in *arr*.

Each line *i* of the *n* subsequent lines (*where 1 ≤ i ≤ n*) contains an integer, *arr[i]*.

Sample Case 0

**Sample Input For Custom Testing**

STDIN    Function

-----    --------

4    →   arr[] size n = 4

1    →   arr = [1, 2, 3, 4]

2

3

4

**Sample Output**

2

3

1

4

**Explanation**

*U =* *2×3×(1÷1)×4 = 24.* All other arrangements where *U = 24* are numerically higher than this array, e.g. *[2, 3, 1, 4] < [3, 4, 1, 2].*

Sample Case 1

**Sample Input For Custom Testing**

STDIN    Function

-----    --------

2    →   arr[] size n = 2

4    →   arr = [4, 5]

5

**Sample Output**

4

5

**Explanation**

*U* is always *4×5* = *20,* and *[4, 5] < [5, 4].*

# Answer

# References

HackerRank

# Source

HackerRank

# Category

C#

# Tech Area

Coding

# Complexity

Simple

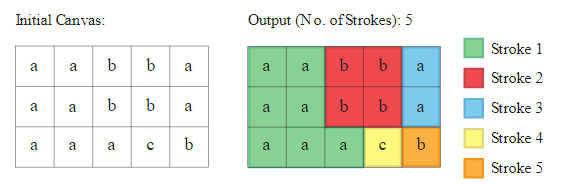
# Question

Digital graphics tools often make available a "bucket fill" tool that will only paint adjacent cells . In one *fill,* a modified bucket tool recolors adjacent cells (connected horizontally or vertically but not diagonally) that have the same color. Given a picture represented as a 2-dimensional array of letters representing colors, find the minimum number of fills to completely repaint the picture.

**Example**

*picture= ["aabba", "aabba", "aaacb"]*

Each string represents a row of the picture and each letter represents a cell's color. The diagram below shows the *5* fills needed to repaint the picture. It takes two fills each for *a* and *b*, and one for *c.* The array *picture* is shown below.

**

***Function Description***

Complete the function *strokesRequired* in the editor below.

strokesRequired has the following parameter(s):

*string picture[h]:*  an array of strings where each string represents one row of the picture to be painted

**Output:**

*int:* the minimum number of fills required to repaint the picture

**Constraints**

* *h* and *w* refer to height and width of the graph.
* *1 ≤ h ≤ 105*
* *1 ≤ w ≤ 105*
* *1 ≤ h\*w ≤ 105*
* *length(picture[i]) = w (where 0 ≤ i < h)*
* *picture[i][j]*is in the set*{'a', 'b', 'c'} (*where*0 ≤ i < h*and*0 ≤ j < w)*

Input Format For Custom Testing

The first line contains an integer, *h*, that denotes the height of the picture and the number of elements in *picture*.  
Each line *i* of the *h* subsequent lines (where *0 ≤ i < h*) contains a string that describes *picture[i]*.

Sample Case 0

**Sample Input For Custom Testing**

STDIN     Function

-----     --------

3     →   picture[] size h = 3

aaaba →   picture *=* [ "aaaba" , "ababa" , "aaaca" ]

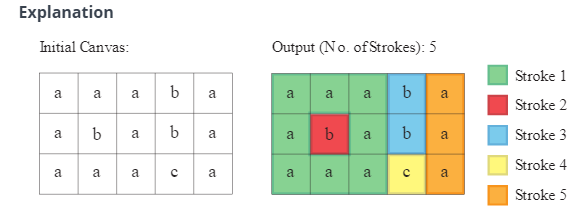
ababa

aaaca

**Sample Output**

5

**Explanation**



Letter *a* takes *2* fills, *b* takes *2* fills and *c* takes *1* fill for a total of *5*.

Sample Case 1

**Sample Input For Custom Testing**

STDIN     Function

-----     --------

4     →   picture[] size h = 4

bbba  →   picture *=* [ "bbba", "abba", "acaa" , "aaac" ]

abba

acaa

aaac

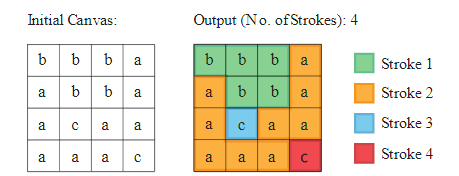
**Sample Output**

4

**Explanation**

Letters *a* and *b* each take *1* fill and letter *c* takes *2* fills.

# Answer



# References

HackerRank

# Source

Hackerrank

# Category

.NET

# Tech Area

C#

# Complexity

Simple

# Question

An e-commerce site has a series of advertisements to display. Links to the ads are stored in a data structure and they are displayed or not based on the value at a bit position in a number. The sequence of ads being displayed at this time can be represented as a binary value, where 1 means the ad is displayed and 0 means it is hidden. The ads should rotate, so on the next page load, ads that are displayed now are hidden and vice versa.

Given a base 10 integer representing the current display state of all ads, determine its binary representation. Starting from the position of its highest order 1 bit, negate that bit and all lower order bits from 0 to 1 or from 1 to 0. Return the base 10 representation of the result.

**Example:**

*base10 = 30*

3010 = 000111102

Strip the insignificant zeros then flip all of the bits in 111102 to get 000012 = 110. The example shows the value as an 8-bit binary to demonstrate that preceding zeros are discarded.

**Function Description**

Complete the function *changeAds* in the editor below.

changeAds has the following parameter:

*int base10:*  an integer in base 10

Return:

*int:* the base 10 value of the resulting binary

**Sample Input**

STDIN    Function

-----    --------

50    →  base10 = 50

**Sample Output 0**

13

**Explanation 0**

*5010* in binary is *1100102*. Negate each bit in the sequence to get *0011012* = *1310*.

# Answer

Paste here.

# References

[Discussion Boards, Comments, Links, etc..]

Paste here.

**QUESTION2: NO PAIRS ALLOWED**

# 1 Source

Hackerrank

# 2 Category

.NET

# 3 Tech Area

C#

# 4 Complexity

Simple

# 5 Question

For each word in a list of words, if any two adjacent characters are equal, change one of them. Determine the minimum number of substitutions so the final string contains no adjacent equal characters.

**Example**

*words = ['add', 'boook', 'break']*

1. *'add':* change one *d* (1 change)
2. *'boook':* change the middle *o*(1 change)
3. *'break':* no changes are necessary (0 changes)

The return array is *[1,1,0]*.

**Function Description**

Complete the function *minimalOperations* in the editor below.

*minimalOperations* has the following parameter(s):

*string words[n]:*  an array of strings

Returns:

*int[n]:* each element *i* is the minimum substitutions for *words[i]*

**Constraints**

* *1 ≤ n ≤ 100*
* *2 ≤ length of words[i] ≤ 105*
* Each character of *words[i]*is in the range*ascii[a-z]*.

# 6 Answer

For each string, start with the character at index 1. Compare each character to the one to its left, with one exception. If the two letters are equal, assume the character to its left remains the same and the current character is replaced. It can always be replaced with a character different from both adjacent characters, left and right. The next character after a replacement can be skipped.

def minimalOperations(words):

ans = []

for w in words:

count = 0

i = 1

while i < len(w):

# test for match

if w[i] == w[i-1]:

# yes: increment counter and skip the next character

count += 1

i += 2

else:

# no: move to the next character

i += 1

ans.append(count)

return ans

--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**QUESTION3:BIT LOGIC**

# 1 Source

Hackerrank

# 2 Category

.NET

# 3 Tech Area

C#

# 4 Complexity

Simple

# 5 Question

For two positive integers, *lo* and *hi,* and a limit *k*, find two integers, *a* and *b*, satisfying the following criteria. Return the value of *a⊕ b. T*he *⊕* symbol denotes the bitwise XOR operator.

* *lo ≤ a < b ≤ hi*
* The value of *a ⊕ b* is maximal for *a ⊕ b ≤ k*.

**Example**

*lo = 3*

*hi = 5*

*k = 6*:

| **a** | **b** | **a ⊕ b** |
| --- | --- | --- |
| 3 | 4 | 7 |
| 3 | 5 | 6 |
| 4 | 5 | 1 |

The maximal useable XORed value is *6* because it is the maximal value that is less than or equal to the limit *k = 6*.

**Function Description**

Complete the function *maxXor* in the editor below. The function must return an integer denoting the maximum possible value of *a ⊕ b* for all *a ⊕ b ≤ k*.

*maxXor* has the following parameter(s):

*int lo:*  an integer

*int hi:*  an integer

*k:*  an integer

**Constraints**

* *1 ≤ lo < hi ≤ 104*
* *1 ≤ k ≤ 104*

Input Format for Custom Testing

Sample Case 0

**Sample Input 0**

STDIN     Function

-----     --------

1    →    lo = 1

3    →    hi = 3

3    →    k = 3

**Sample Output 0**

3

**Explanation 0**

The following are the possible values of *a* and *b* satisfying *lo ≤ a < b ≤ hi*:

* *a = 1, b = 2 ⇒ a ⊕ b = 3*
* *a = 1, b = 3 ⇒ a ⊕ b = 2*
* *a = 2, b = 3 ⇒ a ⊕ b = 1*

The maximum possible value of *a⊕ b ≤ 3* is *3*.

# 6 Answer

**Concepts Covered:** Basic Programming Skills, Loops, Bitmasks, Problem Solving. The problem tests the candidate's ability to use loops and the idea of bitmasks. It requires the candidate to come up with an algorithm to find the maximum xor value between a pair of numbers in the range [lo, hi] such that xor of both numbers is less than K in a constrained time and space complexity.

**Brute force Approach:** Iterate for all possible pairs (i, j), such that lo <= i <= j <= hi, and check for maximum value of i xor j <= k. A good optimization is to break as soon as the maximum xor = k since there will be no more than 1024 distinct xor values for any pairs.

Time Complexity: O((hi-lo) ^ 2)

def maxXor(lo, hi, k):

mx = 0

for i in range(lo, hi+1):

for j in range(i+1, hi+1):

if mx < (i^j) <= k:

mx = i^j

if mx == k:

break

if mx == k:

break

return mx

**QUESTION4 : SERIAL MULTIPLICATION**

# 1 Source

Hackerrank

# 2 Category

.NET

# 3 Tech Area

C#

# 4 Complexity

Simple

**5**  **Question**

If given a series of random numbers like 4, 5, 7, 2, the product of its serial multiplication is 4\*5\*7\*2 = 280.  
  
Given a series of length *n*, where  *1 <= n <= 5,* use *SerialMultiplier* to find the product of the numbers.  
  
Implement the *SerialMultiplier*class which has the following requirements:

* It has 5 integer attributes (first, second, third, fourth, fifth) which store numbers individually. [default value = 1]
* It has a result attribute that stores the product of all numbers in a series.
* It uses the constructor to initialize the 5 integer attributes. [HINT: Implement more than one constructor]
* Printing the instance of SerialMultiplier class prints the product of all numbers in the series.

Note: Receiving input and calling methods is handled by the code stub.

Input Format For Custom Testing

Sample Case 0

**Sample Input**

STDIN     Function

-----     --------

3      → n = 3

1 2 3   → A1..A3 = 1 2 3

**Sample Output**

6

# ------------------------------------------------------------------------------------------------------------------------

**QUESTION5 : COUNT BETWEEN**

# 1 Source

Hackerrank

# 2 Category

.NET

# 3 Tech Area

C#

# 4 Complexity

Simple

**5**  **Question**

Given an array of integers and a series of ranges, determine the number of array elements in the ranges. The ranges are inclusive.

**Example**

*arr = [1, 2, 2, 3, 4]*

*low = [0, 2]*

*high = [2, 4]*

Queries are aligned by index.

1. *low = 0, high = 2:*  There are *3* elements in the range: *[1, 2, 2]*
2. *low = 2, high = 4:*  There are *4* elements in the range:*[2, 2, 3, 4]*

Return the array of answers, aligned by index with their queries: *[3, 4].*

**Constraints**

* *1 ≤ n ≤ 105*
* *1 ≤ arr[j] ≤ 109*
* *1 ≤ q ≤ 105*
* *1 ≤ low[i] ≤ high[i] ≤ 109*

Input Format For Custom Testing

Sample Case 0

**Sample Input For Custom Testing**

**Sample Input 0**

STDIN     Function

-----     --------

5    →    arr[] size n = 5

1    →    arr = [1, 3, 5, 6, 8]

3

5

6

8

1    →    low[] size q = 1

2    →    low = [2]

1    →    high[] size q = 1

6    →    high = [6]

**Sample Output 0**

3

**Explanation 0**

1. There are *3* elements in the inclusive range *[2, 6]: [3, 5, 6]*, so store *3* in index *0* of the return array.

**QUESTION 6 : CONFERENCE SCHEDULING**

# 1 Source

Hackerrank

# 2 Category

.NET

# 3 Tech Area

C#

# 4 Complexity

Simple

**5**  **Question**

A schedule has just been released for an upcoming tech conference. The schedule provides the start and end times of each of the presentations. Once a presentation has begun, no one can enter or leave the room. It takes no time to go from one presentation to another. Determine the maximum number of presentations that can be attended by one person.

**Example**

*n = 3*

*scheduleStart = [1, 1, 2]*

*scheduleEnd = [3, 2, 4]*

Using 0-based indexing, an attendee could attend any presentation alone, or both presentations *1* and *2*. Presentation *0* ends too late to be able to attend presentation *2* afterwards. The maximum number of presentations one person can attend is *2.*

**Function Description**

Complete the function *maxPresentations* in the editor below.

maxPresentations has the following parameter(s):

*scheduleStart[n]:* the start times of presentation *i*

*scheduleEnd[n]:* the end times of presentation *i*

Returns:

*int:* the maximum number of presentations that can be attended by one person

**Constraints**

* 1 ≤ *n* ≤ 105
* 1 ≤ *scheduleStart[i], scheduleEnd[i]* ≤ 109

Input Format For Custom Testing

Sample Case 0

**Sample Input**

STDIN Function

----- -----

4 → scheduleStart[] size n = 4

1 → scheduleStart = [1, 1, 2, 3]

1

2

3

4 → scheduleEnd[] size n = 4

2 → scheduleEnd = [2, 3, 3, 4]

3

3

4

**Sample Output**

3

**Explanation**

An attendee can go to presentations *0, 2*, and *3* without conflict. If presentation *1* is chosen, from time *1* to *3*, only two presentations can be attended. The maximum number of presentations a single person can attend is *3.*

# 6 Answer

**Concepts covered:** Basic Programming Skills, Loops, Arrays, Greedy, Problem Solving. The problem tests the candidate's ability to use loops and arrays handling along with greedy techniques. The candidate must find the maximum number of non-overlapped timings among the given set of n times in a constrained time and space complexity.

**Optimal Solution:**

We approach the problem greedily with the observation being: Suppose we have two timings [x1, y1] and [x2, y2] and y1 > y2. Then it's always optimal to attend the second presentation first. Sort the timings on the basis of the end times in non-decreasing order and go on to choose the next presentation if the start time of the current presentation is greater than the end time of the last presentation.

Time Complexity: O(N logN)

def maxPresentations(scheduleStart, scheduleEnd):

# Write your code here

tup = []

n = len(scheduleStart)

# create a list of start/end tuples

for i in range(n):

tup.append((scheduleStart[i], scheduleEnd[i]))

# sort by ending time

tup.sort(key = lambda x: x[1])

# initialize, attending first meeting

endTime = tup[0][1]

ans = 1

for i in range(1, n):

# if start time >= current endTime

if(tup[i][0] >= endTime):

# go to next meeting

ans += 1

# and update the endTime

endTime = tup[i][1]

return ans



QUESTION BANK DOCKET

**Table of Contents**

[1 Source 2](#_Toc253285289)

[2 Category 3](#_Toc965934774)

[3 Tech Area 3](#_Toc613746458)

[4 Complexity 3](#_Toc904143571)

[5 Question 3](#_Toc1426514880)

[6 Answer 3](#_Toc441207452)

[7 References 3](#_Toc1838997797)

# Source

|  |  |  |
| --- | --- | --- |
|  |  |  |

Code Byte

# Category

Coding

# Tech Area

C#

# Complexity

Simple

# Question

### **1)** First Factorial

Have the function FirstFactorial(**num**) take the **num** parameter being passed and return the factorial of it. For example: if **num** = 4, then your program should return **(4 \* 3 \* 2 \* 1)** = 24. For the test cases, the range will be between 1 and 18 and the input will always be an integer.

#### Examples

Input: 4  
Output: 24

Input: 8  
Output: 40320

**Answer :**

using System;

class MainClass {

  public static int FirstFactorial(int num) {

    int fact = 1;

     for(int i = num; i > 0; i -- )

     {

      // code goes here

        fact = fact \* i;

     }

    return fact ;

  }

  static void Main() {

    // keep this function call here

    Console.WriteLine(FirstFactorial(Console.ReadLine()));

  }

}

# References

https://coderbyte.com/editor/First%20Factorial:Csharp?utm\_campaign=NewHomepage

**Question 2**

### First Reverse

Have the function FirstReverse(**str**) take the **str** parameter being passed and return the string in reversed order. For example: if the input string is "Hello World and Coders" then your program should return the string **sredoC dna dlroW olleH**.

#### Examples

Input: "coderbyte"  
Output: etybredocInput: "I Love Code"  
Output: edoC evoL I

**Answer :**

using System;

class MainClass {

  public static string FirstReverse(string str) {

      string rev ="";

      int len;

      len = str.Length - 1;

      while (len >= 0) {

         rev = rev + str[len];

         len--;

      }

    return rev;

  }

  static void Main() {

    // keep this function call here

    Console.WriteLine(FirstReverse(Console.ReadLine()));

  }

}

# References

https://coderbyte.com/editor/First%20Reverse:Csharp

**Question 3**

##### **How to check if a given number is prime or not in C#?**

**Answer:**

**using** *System;*

**namespace** *LogicalPrograms*

**{**

**public** **class** Program

**{**

**static** **void** Main**(string[]** args**)**

**{**

Console.Write**(**"Enter a Number : "**)**;

**int** number = **int**.Parse**(**Console.ReadLine**())**;

**bool** IsPrime = **true**;

**for** **(int** i = 2; i **<** number/2; i++**)**

**{**

**if** **(**number % i == 0**)**

**{**

IsPrime = **false**;

**break**;

**}**

**}**

**if** **(**IsPrime**)**

**{**

Console.Write**(**"Number is Prime."**)**;

**}**

**else**

**{**

Console.Write**(**"Number is not Prime."**)**;

**}**

Console.ReadKey**()**;

**}**

**}**

**}**

**Output:**

Prime Numbers in C#

# References

**https://dotnettutorials.net/lesson/prime-numbers-in-csharp/**

|  |
| --- |
|  |

**Question 4**

##### Write a C# program to find the given number is **Disarium number or not**

**using** *System;*

**public** **class** Program

**{**

**public** **static** **void** Main **()**

**{**

Console.WriteLine **(**"Input a number"**)**;

**int** num = Convert.ToInt32 **(**Console.ReadLine **())**;

**string** numStr = num.ToString **()**;

**int** length = numStr.Length;

**int** divide = 0, sum = 0, copy = num;

**while** **(**copy **>** 0**)**

**{**

divide = copy % 10;

sum = sum + **(int)** Math.Pow **(**divide, length**)**;

length--;

copy = copy / 10;

**}**

**if** **(**sum == num**)**

Console.WriteLine **(**"Disarium Number."**)**;

**else**

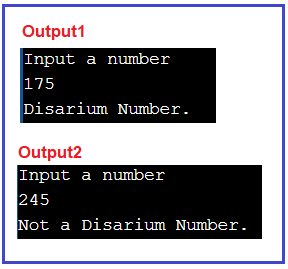
Console.WriteLine **(**"Not a Disarium Number."**)**;

Console.ReadLine **()**;

**}**

**}**

###### **Output:**



# References : https://dotnettutorials.net/lesson/disarium-number-in-csharp/

**Question 5 : Write a C# Programe to find sum of Odd number from 1 to n .**

**using** *System;*

**namespace** *DotNetTutorials*

**{**

**class** SumOfOddNumbers

**{**

**static** **void** Main**(string[]** args**)**

**{**

**int** sum = 0, i = 1;

Console.Write**(**"Enter value a Number:"**)**;

**int** Number = Convert.ToInt32**(**Console.ReadLine**())**;

**while** **(**i **<**= Number**)**

**{**

sum += i;

i += 2;

**}**

Console.Write**(**$"Sum of Odd numbers from 1 to {Number} is : {sum}"**)**;

Console.ReadLine**()**;

**}**

**}**

**}**

###### **Output:**

**How to Find the sum of odd numbers from 1 to N in C# with Examples**

**Question 6 : Write a C# program to convert  Celsius to Fahrenheit**

**using** *System;*

**class** CelsiusToFahrenheit

**{**

**static** **void** Main**()**

**{**

**float** celsius = 36;

Console.WriteLine**(**"Temperature in celsius is: " + celsius**)**;

**float** fahrenheit = **((**celsius \* 9**)** / 5**)** + 32;

Console.WriteLine**(**"Temperature in Fahrenheit is: " + fahrenheit**)**;

Console.ReadKey**()**;

**}**

**}**

###### **Output:**

Convert Celsius to Fahrenheit in C#



QUESTION BANK DOCKET

1 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**Table** **of** **Contents**

1 Source.............................................................................................................................................3 2 Category..........................................................................................................................................3 3 Tech Area........................................................................................................................................3 4 Complexity......................................................................................................................................3 5 Question..........................................................................................................................................3 6 Answer............................................................................................................................................3 7 References.......................................................................................................................................3

2 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

**4 Complexity**

Simple

**5** **Question**

1.Use the correct method to sort the cars array

**6** **Answer**

string[] cars = {"Volvo", "BMW", "Ford", "Mazda"};

.();

foreach (string i in cars)

{

Console.WriteLine(i);

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3schools.com/cs/cs\_exercises.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

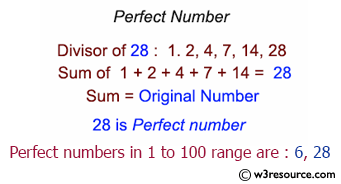
**4 Complexity**

Medium

**5** **Question**

2. Write a C# Sharp Program to find the perfect numbers within a given range of number

**6** **Answer**



/\*Perfect number is a positive number which sum of all positive divisors excluding\*/

/\*that number is equal to that number. For example 6 is perfect number since divisor of 6 are 1, 2 and 3.\*/

/\*Sum of its divisor is 1 + 2+ 3 = 6\*/

using System;

public class Exercise28

{

public static void Main()

{

int n,i,sum;

int mn,mx;

Console.Write("\n\n");

Console.Write("Find perfect numbers within a given number of range:\n");

Console.Write("------------------------------------------------------");

Console.Write("\n\n");

Console.Write("Input the starting range or number : ");

mn = Convert.ToInt32(Console.ReadLine());

Console.Write("Input the ending range of number : ");

mx = Convert.ToInt32(Console.ReadLine());

Console.Write("The Perfect numbers within the given range : ");

for(n=mn;n<=mx;n++)

{

i=1;

sum = 0;

while(i<n)

{

if(n%i==0)

sum=sum+i;

i++;

}

if(sum==n)

Console.Write("{0} ",n);

}

Console.Write("\n");

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/for-loop/csharp-for-loop-exercise-28.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

**4 Complexity**

Simple

**5** **Question**

3.Write a program in C# Sharp to display the cube of the number up to given an integer.

**6** **Answer**

using System;

public class Exercise2

{

public static void Main()

{

int i,ctr;

Console.Write("\n\n");

Console.Write("Display the cube of the number:\n");

Console.Write("---------------------------------");

Console.Write("\n\n");

Console.Write("Input number of terms : ");

ctr= Convert.ToInt32(Console.ReadLine());

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

{

Console.Write("Number is : {0} and cube of the {1} is :{2} \n",i,i, (i\*i\*i));

}

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/for-loop/csharp-for-loop-exercise-5.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

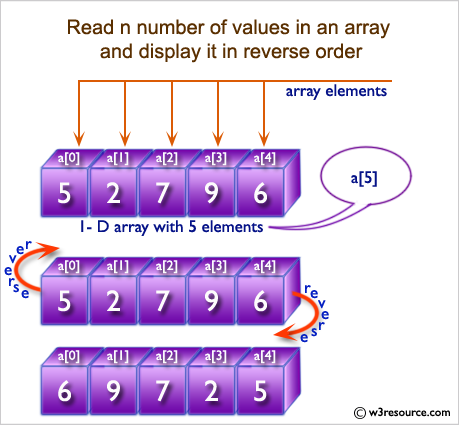
**4 Complexity**

Medium

**5** **Question**

4.Write a program in C# Sharp to read n number of values in an array and display it in reverse order

**6** **Answer**



using System;

public class Exercise2

{

public static void Main()

{

int i,n;

int[] a= new int[100];

Console.Write("\n\nRead n number of values in an array and display it in reverse order:\n");

Console.Write("------------------------------------------------------------------------\n");

Console.Write("Input the number of elements to store in the array :");

n = Convert.ToInt32(Console.ReadLine());

Console.Write("Input {0} number of elements in the array :\n",n);

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

{

Console.Write("element - {0} : ",i);

a[i] = Convert.ToInt32(Console.ReadLine());

}

Console.Write("\nThe values store into the array are : \n");

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

{

Console.Write("{0} ",a[i]);

}

Console.Write("\n\nThe values store into the array in reverse are :\n");

for(i=n-1;i>=0;i--)

{

Console.Write("{0} ",a[i]);

}

Console.Write("\n\n");

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/array/csharp-array-exercise-2.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

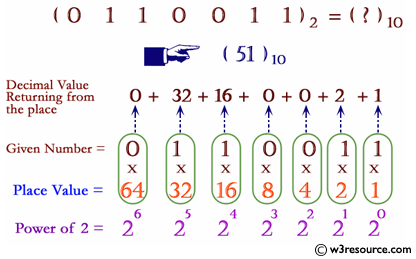
**4 Complexity**

Complex

**5** **Question**

5.Write a program in C# Sharp to convert a binary number into a decimal number without using an array, function and while loop.

**6** **Answer**



using System;

public class Exercise42

{

public static void Main()

{ int n1, n,p=1;

int dec=0,i=1,j,d;

Console.Write("\n\n");

Console.Write("Convert a binary to decimal using for loop and without using array:\n");

Console.Write("---------------------------------------------------------------------");

Console.Write("\n\n");

Console.Write("Input a binary number :");

n = Convert.ToInt32(Console.ReadLine());

n1=n;

for (j=n;j>0;j=j/10)

{

d = j % 10;

if(i==1)

p\*=1;

else

p\*=2;

dec=dec+(d\*p);

i++;

}

Console.Write("\nThe Binary Number : {0}\nThe equivalent Decimal Number : {1} \n\n",n1,dec);

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/for-loop/csharp-for-loop-exercise-42.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

**4 Complexity**

Medium

**5** **Question**

6. Write a program in C# Sharp for multiplication of two square Matrices

**6** **Answer**

using System;

public class Exercise21

{

public static void Main()

{

int i,j,k,r1,c1,r2,c2,sum=0;

int[,] arr1 = new int[50,50];

int[,] brr1 = new int[50,50];

int[,] crr1 = new int[50,50];

Console.Write("\n\nMultiplication of two Matrices\n");

Console.Write("----------------------------------\n");

Console.Write("\nInput the number of rows and columns of the first matrix :\n");

Console.Write("Rows : ");

r1 = Convert.ToInt32(Console.ReadLine());

Console.Write("Columns : ");

c1 = Convert.ToInt32(Console.ReadLine());

Console.Write("\nInput the number of rows of the second matrix :\n");

Console.Write("Rows : ");

r2 = Convert.ToInt32(Console.ReadLine());

Console.Write("Columns : ");

c2 = Convert.ToInt32(Console.ReadLine());

if(c1!=r2){

Console.Write("Mutiplication of Matrix is not possible.");

Console.Write("\nColumn of first matrix and row of second matrix must be same.");

}

else

{

Console.Write("Input elements in the first matrix :\n");

for(i=0;i<r1;i++)

{

for(j=0;j<c1;j++)

{

Console.Write("element - [{0}],[{1}] : ",i,j);

arr1[i,j] = Convert.ToInt32(Console.ReadLine());

}

}

Console.Write("Input elements in the second matrix :\n");

for(i=0;i<r2;i++)

{

for(j=0;j<c2;j++)

{

Console.Write("element - [{0}],[{1}] : ",i,j);

brr1[i,j] = Convert.ToInt32(Console.ReadLine());

}

}

Console.Write("\nThe First matrix is :\n");

for(i=0;i<r1;i++)

{

Console.Write("\n");

for(j=0;j<c1;j++)

Console.Write("{0}\t",arr1[i,j]);

}

Console.Write("\nThe Second matrix is :\n");

for(i=0;i<r2;i++)

{

Console.Write("\n");

for(j=0;j<c2;j++)

Console.Write("{0}\t",brr1[i,j]);

}

//multiplication of matrix

for(i=0;i<r1;i++)

for(j=0;j<c2;j++)

crr1[i,j]=0;

for(i=0;i<r1;i++) //row of first matrix

{

for(j=0;j<c2;j++) //column of second matrix

{

sum=0;

for(k=0;k<c1;k++)

sum=sum+arr1[i,k]\*brr1[k,j];

crr1[i,j]=sum;

}

}

Console.Write("\nThe multiplication of two matrix is : \n");

for(i=0;i<r1;i++)

{

Console.Write("\n");

for(j=0;j<c2;j++)

{

Console.Write("{0}\t",crr1[i,j]);

}

}

}

Console.Write("\n\n");

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/array/csharp-array-exercise-21.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

As given in the excel for respective categories

**4 Complexity**

Complex

**5** **Question**

7. Write a C# Sharp program that calculates the sum of all prime numbers in an array of numbers.

Sample Data:  
({ 7, 5, 85, 9, 11, 23, 18 }) -> 46  
({ 200, 300, 250, 151, 162 }) -> 151

**6** **Answer**

using System;

using System.Linq;

namespace exercises

{

class Program

{

static void Main(string[] args)

{

int[] nums = { 7, 5, 85, 9, 11, 23, 18 };

Console.WriteLine("Original array elements:");

Console.WriteLine($"{string.Join(", ", nums)}");

Console.WriteLine("Sum of all prime numbers in the said array: " + test(nums));

int[] nums1 = { 200, 300, 250, 151, 162 };

Console.WriteLine("\nOriginal array elements:");

Console.WriteLine($"{string.Join(", ", nums1)}");

Console.WriteLine("Sum of all prime numbers in the said array: " + test(nums1));

}

public static int test(int[] arr)

{

int result = 0;

foreach (int number in arr)

{

if (IsPrime(number, number/2))

{

result += number;

}

}

return result;

}

static bool IsPrime(int n1, int i)

{

if (i == 1)

{

return true;

}

else

{

if (n1 % i == 0)

return false;

else

return IsPrime(n1, i - 1);//calling the function IsPrime itself recursively

}

}

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/array/csharp-array-exercise-39.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .NET, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

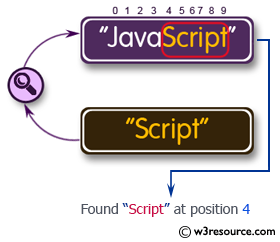
**4 Complexity**

Medium

**5** **Question**

8. Write a program in C# Sharp to search the position of a substring within a string

**6** **Answer**



using System;

public class Exercise17

{

public static void Main()

{

string str1;

string findstr;

Console.Write("\n\nSearch the position of a substing within a string :\n");

Console.Write("-------------------------------------------------------\n");

Console.Write("Input a String: ");

str1 = Console.ReadLine();

Console.Write("Input a substring to be found in the string: ");

findstr = Console.ReadLine();

int index = str1.IndexOf(findstr);

if(index<0)

Console.WriteLine("The substring no found in the given string \n");

else

Console.WriteLine("Found '{0}' in '{1}' at position {2}",

findstr, str1, index);

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/string/csharp-string-exercise-17.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3school]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

As given in the excel for respective categories

**4 Complexity**

Medium

**5** **Question**

9. Write a C# Sharp program that converts a given string’s character as ASCII to hexadecimal value as a string.

**Sample Data:**  
("Python") -> "50 79 74 68 6f 6e"  
("Century of the year") -> 43 65 6e 74 75 72 79 20 6f 66 20 74 68 65 20 79 65 61 72  
("CPP Exercises") -> 43 50 50 20 45 78 65 72 63 69 73 65 73

**6** **Answer**

using System;

using System.Linq;

namespace exercises

{

class Program

{

static void Main(string[] args)

{

string text = "Python";

Console.WriteLine("Original strings: " + text);

Console.WriteLine("Convert said ASCII text to hexadecimal value as a string:" + test(text));

text = "Century of the year";

Console.WriteLine("\nOriginal strings: " + text);

Console.WriteLine("Convert said ASCII text to hexadecimal value as a string:" + test(text));

text = "CPP Exercises";

Console.WriteLine("\nOriginal strings: " + text);

Console.WriteLine("Convert said ASCII text to hexadecimal value as a string:" + test(text));

}

public static string test(string text)

{

return text.ToCharArray().Aggregate("", (a, b) => a + ((byte)b).ToString("X") + " ").ToLower().Trim();

}

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/string/csharp-string-exercise-67.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.

**pratian**

**1** **Source**

Enter the name of the source where you got the question from [w3School]

**2** **Category**

Programming, Java, .**NET**, SQL, Angular (Mark one of the above as Bold and Underline)

**3** **Tech** **Area**

C#

**4 Complexity**

Medium

**5** **Question**

10. Write a program in C# Sharp to calculate and print the Electricity bill of a given customer. The customer id., name and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow:

|  |  |
| --- | --- |
| **Unit** | **Charge/unit** |
| upto 199 | @1.20 |
| 200 and above but less than 400 | @1.50 |
| 400 and above but less than 600 | @1.80 |
| 600 and above | @2.00 |

If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/

**6** **Answer**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

public class exercise18

{

static void Main(string[] args)

{

int custid, conu;

double chg, surchg=0, gramt,netamt;

string connm;

Console.Write("\n\n");

Console.Write("Calculate Electricity Bill:\n");

Console.Write("----------------------------");

Console.Write("\n\n");

Console.Write("Input Customer ID :");

custid= Convert.ToInt32(Console.ReadLine());

Console.Write("Input the name of the customer :");

connm= Console.ReadLine();

Console.Write("Input the unit consumed by the customer : ");

conu= Convert.ToInt32(Console.ReadLine());

if (conu <200 )

chg = 1.20;

else if (conu>=200 && conu<400)

chg = 1.50;

else if (conu>=400 && conu<600)

chg = 1.80;

else

chg = 2.00;

gramt = conu\*chg;

if (gramt>300)

surchg = gramt\*15/100.0;

netamt = gramt+surchg;

if (netamt < 100)

netamt =100;

Console.Write("\nElectricity Bill\n");

Console.Write("Customer IDNO :{0}\n",custid);

Console.Write("Customer Name :{0}\n",connm);

Console.Write("unit Consumed :{0}\n",conu);

Console.Write("Amount Charges @Rs. {0} per unit :{1}\n",chg,gramt);

Console.Write("Surchage Amount :{0}\n",surchg);

Console.Write("Net Amount Paid By the Customer :{0}\n",netamt);

}

}

**7** **References**

[Discussion Boards, Comments, Links, etc..]

https://www.w3resource.com/csharp-exercises/conditional-statement/csharp-conditional-statement-exercise-18.php

3 © 2021 Pratian Technologies (India) Pvt., Ltd.



QUESTION BANK DOCKET

**Table of Contents**

[1 Source 3](#_Toc124585200)

[2 Tech 3](#_Toc124585201)

[3 Focus Area 3](#_Toc124585202)

[4 Complexity 3](#_Toc124585203)

[5 Question 3](#_Toc124585204)

[6 Answer 3](#_Toc124585205)

[7 References 3](#_Toc124585206)

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Simple

1. **Question**

Compute number of distinct values in an array, that, given an array A consisting of N integers, returns the number of distinct values in array A.

For example, given array A consisting of six elements such that:

A0] = 2 A[1] = 1 A[2] = 1 A[3] = 2 A[4] = 3 A[5] = 1

the function should return 3, because there are 3 distinct values appearing in array A, namely 1, 2 and 3.

1. **Answer**

static void Distinct(int[] arr, int n)

{

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

{

int j;

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

if (arr[i] == arr[j])

break;

if (i == j)

Console.Write(arr[i] + " ");

}

}

public static void Main()

{

int[] arr = { 2, 1, 1, 2, 3, 1 };

int n = arr.Length;

Distinct(arr, n);

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

https://www.geeksforgeeks.org/print-distinct-elements-given-integer-array/

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Simple

1. **Question**

Write a program convert any decimal number (base-10 (i.e. 0 to 9)) into binary number (base-2 (i.e. 0 or 1)).

1. **Answer**

public class Program

{

static void Main(string[] args)

{

Console.Write("Enter the Decimal Number : ");

int number = int.Parse(Console.ReadLine());

int i;

int[] numberArray = new int[10];

for (i = 0; number > 0; i++)

{

numberArray[i] = number % 2;

number = number / 2;

}

Console.Write("Binary Represenation of the given Number : ");

for (i = i - 1; i >= 0; i--)

{

Console.Write(numberArray[i]);

}

}

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

https://dotnettutorials.net/lesson/decimal-to-binary-conversion-in-csharp/

1. **Source**

Enter the name of the source where you got the question from

.NET Tutorials

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Simple

1. **Question**

Write a program to sort the given elements using Bubble Sort.

1. **Answer**

class Program

{

static void Main(string[] args)

{

int count = 0;

int[] intArray = new int[5];

Console.WriteLine("Enter the Array Elements : ");

for (int i = 0; i < intArray.Length; i++)

{

intArray[i] = int.Parse(Console.ReadLine());

}

for (int j = 0; j <= intArray.Length - 2; j++)

{

for (int i = 0; i <= intArray.Length - 2; i++)

{

count = count + 1;

if (intArray[i] > intArray[i + 1])

{

int temp = intArray[i + 1];

intArray[i + 1] = intArray[i];

intArray[i] = temp;

}

}

}

Console.WriteLine("After Sorting Array :");

foreach (int item in intArray)

{

Console.Write(item + " ");

}

Console.WriteLine();

Console.WriteLine("The Loop iterates :" + count);

Console.ReadKey();

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Medium

1. **Question**
   1. Write a program to Find the smallest positive integer that does not occur in a given sequence.

that, given an array A of N integers, returns the smallest positive integer (greater than 0) that does not occur in A.

For example, given A = [1, 3, 6, 4, 1, 2], the function should return 5.

Given A = [1, 2, 3], the function should return 4.

Given A = [−1, −3], the function should return 1.

1. **Answer**

namespace ConsoleApp1

{

public class Program

{

public static void Main()

{

int[] A = { 1, 3, 6, 4, 1, 2 };

var smallestInt = 1;

smallestInt = GetSmallestPositiveInteger(A);

Console.WriteLine(smallestInt);

}

public static int solution(int[] array)

{

HashSet<int> found = new HashSet<int>();

for (int i = 0; i < array.Length; i++)

{

if (array[i] > 0)

{

found.Add(array[i]);

}

}

int result = 1;

while (found.Contains(result))

{

result++;

}

return result;

}

public static int solution1(int[] A)

{

int flag = 1;

A = A.OrderBy(x => x).ToArray();

for (int i = 0; i < A.Length; i++)

{

if (A[i] <= 0)

continue;

else if (A[i] == flag)

{

flag++;

}

}

return flag;

}

public static int GetSmallestPositiveInteger(int[] A)

{

var smallestInt = 1;

var arrLn = A.Length;

if ((A == null) || (A.Length == 0)) { return 1; }

return arrLn;

A = A.OrderBy(x => x).ToArray();

for (int i = 0; i < A.Length; i++)

{

if (A[i] <= 0)

continue;

else if (A[i] == smallestInt)

{

smallestInt++;

}

}

return smallestInt;

}

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

https://dotnetfiddle.net/5eT3pk

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Simple

1. **Question**

Compute number of integers divisible by k in range [a..b], that, given three integers A, B and K, returns the number of integers within the range [A..B] that are divisible by K, i.e.:

{ i : A ≤ i ≤ B, i mod K = 0 }

For example, for A = 6, B = 11 and K = 2, your function should return 3, because there are three numbers divisible by 2 within the range [6..11], namely 6, 8 and 10.

1. **Answer**

public class Program

{

static int countDivisibles(int A, int B, int M)

{

int counter = 0;

for (int i = A; i <= B; i++)

if (i % M == 0)

counter++;

return counter;

}

public static void Main()

{

int A = 6, B = 12, M = 3;

Console.WriteLine(countDivisibles(A, B, M));

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

https://www.geeksforgeeks.org/count-numbers-divisible-m-given-range/

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Medium

1. **Question**

Given array of integers, find the lowest absolute sum of elements, For a given array A of N integers and a sequence S of N integers from the set {−1, 1}, we define val(A, S) as follows:

val(A, S) = |sum{ A[i]\*S[i] for i = 0..N−1 }|

For example, given array:

A[0] = 1

A[1] = 5

A[2] = 2

A[3] = -2

1. **Answer**

internal class Program

{

public static int sumOfMinAbsDifferences(int[] arr, int n)

{

var sum = 0;

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

{

var diff = int.MaxValue;

for (int j = 0; j < n; j++)

{

if (i != j)

{

diff = Math.Min(diff, Math.Abs(arr[i] - arr[j]));

}

}

sum += diff;

}

// required sum

return sum;

}

public static void Main(String[] args)

{

int[] arr = { 1,5,2,-2 };

var n = arr.Length;

Console.WriteLine("Sum = " + Program.sumOfMinAbsDifferences(arr, n).To.String());

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

https://www.geeksforgeeks.org/sum-minimum-absolute-difference-array-element/

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Medium

1. **Question**

Find an index of an array such that its value occurs at more than half of indices in the array, An array A consisting of N integers is given. The dominator of array A is the value that occurs in more than half of the elements of A.

For example, consider array A such that

A[0] = 3 A[1] = 4 A[2] = 3

A[3] = 2 A[4] = 3 A[5] = -1

A[6] = 3 A[7] = 3

The dominator of A is 3 because it occurs in 5 out of 8 elements of A (namely in those with indices 0, 2, 4, 6 and 7) and 5 is more than a half of 8.

1. **Answer**

internal class Program

{

static void findMajority(int[] arr, int n)

{

int maxCount = 0;

int index = -1;

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

{

int count = 0;

for (int j = 0; j < n; j++)

{

if (arr[i] == arr[j])

count++;

}

if (count > maxCount)

{

maxCount = count;

index = i;

}

}

if (maxCount > n / 2)

Console.WriteLine(arr[index]);

else

Console.WriteLine("No Majority Element");

}

static public void Main()

{

int[] arr = { 3,4,3,2,3,-1,3,3 };

int n = arr.Length;

findMajority(arr, n);

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

<https://www.geeksforgeeks.org/majority-element/>

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Medium

1. **Question**

Count the number of different ways of climbing to the top of a ladder. You have to climb up a ladder. The ladder has exactly N rungs, numbered from 1 to N. With each step, you can ascend by one or two rungs. More precisely:

* with your first step you can stand on rung 1 or 2,
* if you are on rung K, you can move to rungs K + 1 or K + 2,
* finally you have to stand on rung N.

Your task is to count the number of different ways of climbing to the top of the ladder.

For example, given N = 4, you have five different ways of climbing, ascending by:

* 1, 1, 1 and 1 rung,
* 1, 1 and 2 rungs,
* 1, 2 and 1 rung,
* 2, 1 and 1 rungs, and
* 2 and 2 rungs.

1. **Answer**

internal class Program

{

static void Main(string[] args)

{

static int fib(int n)

{

if (n <= 1)

return n;

return fib(n - 1) + fib(n - 2);

}

static int countWays(int s)

{

return fib(s + 1);

}

int s = 5;

Console.WriteLine("Number of ways = " + countWays(s));

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

<https://www.geeksforgeeks.org/count-ways-reach-nth-stair/>

1. **Source**

Enter the name of the source where you got the question from

Codility

1. **Tech**

Programming, Java, .NET, SQL, Angular

**(.NET)**

1. **Focus Area**

As given in the form for respective categories

**C#(Coding)**

1. **Complexity**

Simple / Medium / Complex

Simple

1. **Question**

Compute number of distinct absolute values of sorted array elements. A non-empty array A consisting of N numbers is given. The array is sorted in non-decreasing order. The absolute distinct count of this array is the number of distinct absolute values among the elements of the array.

For example, consider array A such that:

A[0] = -5

A[1] = -3

A[2] = -1

A[3] = 0

A[4] = 3

A[5] = 6

The absolute distinct count of this array is 5, because there are 5 distinct absolute values among the elements of this array, namely 0, 1, 3, 5 and 6.

1. **Answer**

internal class Program

{

static void Main(string[] args)

{

static int distinctCount(int[] arr, int n)

{

HashSet<int> s = new HashSet<int>();

// Note that set keeps only one

// copy even if we try to insert

// multiple values

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

s.Add(Math.Abs(arr[i]));

return s.Count;

}

int[] arr = { -5, -3, -1, 0, 3, 6 };

int n = arr.Length;

Console.Write("Count of absolute distinct values : "

+ distinctCount(arr, n));

}

}

1. **References**

[Discussion Boards, Comments, Links, etc..]

https://www.geeksforgeeks.org/absolute-distinct-count-array-sorted-absolute-values/



QUESTION BANK DOCKET

**Table of Contents**

[1 Source 2](#_Toc253285289)

[2 Category 3](#_Toc965934774)

[3 Tech Area 3](#_Toc613746458)

[4 Complexity 3](#_Toc904143571)

[5 Question 3](#_Toc1426514880)

[6 Answer 3](#_Toc441207452)

[7 References 3](#_Toc1838997797)

# Source

Leet Code

# Category

|  |
| --- |
| DOT NET |

# Tech Area

C#

# Complexity

Simple

# Question

1. Given an integer x, return true *if* x *is a* ***palindrome****, and* false *otherwise*.
2. Given an input string s and a pattern p, implement regular expression matching with support for '.' and '\*' where:

* '.' Matches any single character.
* '\*' Matches zero or more of the preceding element. The matching should cover the **entire** input string (not partial).

1. Given an integer array nums, return all the triplets [nums[i], nums[j], nums[k]] such that i != j, i != k, and j != k, and nums[i] + nums[j] + nums[k] == 0. Notice that the solution set must not contain duplicate triplets.
2. Given an integer array nums and an integer val, remove all occurrences of val in nums **in-place**. The relative order of the elements may be changed. Since it is impossible to change the length of the array in some languages, you must instead have the result be placed in the **first part** of the array nums. More formally, if there are k elements after removing the duplicates, then the first k elements of nums should hold the final result. It does not matter what you leave beyond the first k elements. Return k *after placing the final result in the first* k *slots of* nums. Do **not** allocate extra space for another array. You must do this by **modifying the input array in-place** with O(1) extra memory.
3. Given two strings needle and haystack, return the index of the first occurrence of needle in haystack, or -1 if needle is not part of haystack.
4. You are given the heads of two sorted linked lists list1 and list2.Merge the two lists in a one **sorted** list. The list should be made by splicing together the nodes of the first two lists. Return *the head of the merged linked list*.
5. Given n pairs of parentheses, write a function to *generate all combinations of well-formed parentheses*.
6. You are given an array of k linked-lists lists, each linked-list is sorted in ascending order. *Merge all the linked-lists into one sorted linked-list and return it.*
7. Given a string containing just the characters '(' and ')', return *the length of the longest valid (well-formed) parentheses* Substring
8. Given a sorted array of distinct integers and a target value, return the index if the target is found. If not, return the index where it would be if it were inserted in order. You must write an algorithm with O (log n) runtime complexity.

# Answer

1.

public class Solution {

public bool IsPalindrome(int x) {

{

if (x < 0) { return false; }

if (x < 10) { return true; }

var temp = x;

var b = 0;

var digit = 0;

while (temp != 0)

{

digit = temp % 10;

b = b \* 10 + digit;

temp /= 10;

}

return x == b;

}

}

}

2.

public class Solution {

public bool IsMatch(string s, string p) {

if (p.Length == 0) {

return s.Length == 0;

}

if (p.Length > 1 && p[1] == '\*') {

while (!string.IsNullOrEmpty(s) && (s[0] == p[0] || p[0] == '.')) {

if (IsMatch(s, p.Substring(2))) {

return true;

}

s = s.Substring(1);

}

return IsMatch(s, p.Substring(2));

} else {

if (!string.IsNullOrEmpty(s) && (s[0] == p[0] || p[0] == '.')) {

return IsMatch(s.Substring(1), p.Substring(1));

} else {

return false;

}

}

}

}

3.

public class Solution {

public IList<IList<int>> ThreeSum(int[] nums) {

List<IList<int>> result = new List<IList<int>>() ;

Array.Sort(nums);

if(nums[0]>0 && nums.Length<3 ) return result;

for(int i=0; i<nums.Length-2; i++)

{

int k=nums.Length-1;

for(int j=i+1; j<k;)

{

if (nums[i]+nums[j]+nums[k]==0)

{

result.Add(new List<int>(){nums[i], nums[j], nums[k]});

while(nums[j] == nums[j+1] && j<k-1) j++;

j++;

while(nums[k]==nums[k-1] && k>j+1) k--;

k--;

}

else if (nums[i]+ nums[j]+nums[k]>0)

{

while(nums[k]==nums[k-1] && k>j+1) k--;

k--;

}

else

{

while(nums[j] == nums[j+1] && j<k-1) j++;

j++;

}

}

while(nums[i]==nums[i+1] && i<nums.Length-2) i++;

}

return result;

}

}

4.

public class Solution {

public int RemoveElement(int[] nums, int val) {

var lastindex = nums.Length-1;

for (int i = 0; i<=lastindex; i++)

{

if (nums[i] == val)

{

nums[i--] = nums[lastindex--];

}

}

return lastindex + 1;

}

}

5.

public class Solution {

public int StrStr(string haystack, string needle) {

for(int i =0;i<haystack.Length-needle.Length+1;i++)

{

for(int j = 1;j<needle.Length+1;j++)

{

if(haystack.Substring(i,j) != needle.Substring(0,j))

{

break;

}

if(haystack.Substring(i,j) == needle)

{

return i;

}

}

}

return -1;

}

}

6.

public class Solution {

public ListNode MergeTwoLists(ListNode list1, ListNode list2) {

if(list1 == null && list2 == null)

{

return list2;

}

ListNode current = new ListNode(0);

ListNode head = current;

while(list1 != null && list2 != null)

{

if(list1.val<list2.val)

{

current.next = list1;

list1 = list1.next;

}

else

{

current.next = list2;

list2 = list2.next;

}

current = current.next;

}

if(list1!=null)

{

current.next = list1;

}

if(list2!=null)

{

current.next = list2;

}

return head.next;

}

}

7.

public class Solution {

List<string> result = new List<string>();

int maxLen;

public IList<string> GenerateParenthesis(int n) {

maxLen = n;

GenerateAndCheck("", 0, 0);

return result;

}

private void GenerateAndCheck(string str, int opened, int closed)

{

if(opened == closed && opened == maxLen)

{

result.Add(str);

return;

}

if(opened < maxLen)

GenerateAndCheck(str + "(", opened + 1, closed);

if(closed < opened)

GenerateAndCheck(str + ")", opened, closed + 1);

}

}

8.

public class Solution {

public ListNode MergeKLists(ListNode[] lists) {

var min = int.MaxValue;

var node = new ListNode();

var root = node;

var index = 0;

var total = 0;

while(true){

total = 0;

min = int.MaxValue;

for(int i=0;i<lists.Length;i++){

if(lists[i] == null){

total++;

continue;

}

if(lists[i].val < min){

min = lists[i].val;

index = i;

}

}

if(total == lists.Length){

break;

}

node.next = new ListNode(min);

node = node.next;

lists[index] = lists[index].next;

}

return root.next;

}

}

9.

public class Solution {

public int LongestValidParentheses(string s) {

int ans = 0;

int count = 0;

Stack<int> stack = new Stack<int>();

for (int i = 0; i < s.Length; i++)

{

if (s[i] == '(')

{

stack.Push(i);

}

else

{

if (stack.Count > 0)

{

stack.Pop();

count += 2;

}

else

{

ans = Math.Max(ans, count);

count = 0;

}

}

}

ans = Math.Max(ans, count);

if (stack.Count == s.Length)

{

return 0;

}

if (stack.Count > 0)

{

List<string> subStrings = new List<string>();

int index = stack.Pop();

var subString1 = s.Substring(0, index);

var subString2 = s.Substring(index + 1, s.Length - index - 1);

var len1 = LongestValidParentheses(subString1);

var len2 = LongestValidParentheses(subString2);

ans = Math.Max(len2, len1);

}

return ans;

}

}

10.

public class Solution {

public int SearchInsert(int[] nums, int target) {

int startIndex = 0;

int endIndex = nums.Length - 1;

while(startIndex <= endIndex)

{

int midIndex = (startIndex + endIndex) / 2;

if(target == nums[midIndex]) return midIndex;

else if (target < nums[midIndex]) endIndex = midIndex - 1;

else startIndex = midIndex + 1;

}

return startIndex;

}

}

# References

[Discussion Boards, Comments, Links, etc..]x

https://leetcode.com/problemset/all/