Heuristics Evaluation : C-T 008

Usability Heuristics: An Evaluation of the Geeks for Geeks website

Overview

We conducted a Heuristic Evaluation for the coding education and job platform, Geeks for Geeks. As users of their articles especially for troubleshooting during our own coding projects, we reviewed the website through the 10 usability heuristics for UI as outlined by Jakob Nielsen. To narrow our evaluation scope, we chose 4 tasks that covered the major use cases of website:

1. Finding the details for troubleshooting a coding problem
2. General information to prepare for an interview on computer science topics
3. Attempting questions to practice programming
4. Searching for a development job

Methodology

We defined 3 usability rules for each heuristic and assigned ratings (from 0 to 3) based on the number of rules the website complied with. This was repeated for each task across the 10 heuristics by 3 different people. The final ratings were computed into a percentage score for each heuristic (data can be found in the Appendix). Details on the heuristics and usability rules are outlined below.

Heuristics & Usability Rules

- **Visibility of system status**
    1. Is the user completely aware of the current stage in his/her journey?

2. Is the user able to understand/identify changes in the journey?
3. Is the user able to identify the pathways to explore more/ backtrack on previous content?

- **Match between system and the real world**
    1. Are UI elements/ prompts/ general flow intuitively recognizable?
    2. Does the digital information-seeking mechanism replicate the familiarity of physical ones?
    3. Does the website use jargon that need an explanation? Have technical acronyms been clearly symbolized and explained?

- **User control and freedom**
    1. Does the user feel in control of moving through the website, especially the exit states?
    2. Is the user able to explore most of the content without restrictions (sign-up/subscribe etc)?
    3. Is any personal information that is being asked communicated clearly without deception?

- **Consistency and standards**
    1. Is there a consistent design/pattern to all Call To Actions and other UI elements on the website?
    2. Is there a consistent design standard to mobile view/web view for same tasks?
    3. Is there a design consistency of views for multiple information sources-articles/tutorials/exercises etc

- **Error prevention**

1. Are there helpful constraints that prevent the user from making mistakes?
2. Is there enough visual guidance/ assistance for new users to create familiarity with the platform?
3. Are there necessary suggestions during the journey to keep the user from making errors?

- **Recognition rather than recall**
  1. Is the user intuitively able to understand the flow for undertaking various tasks?
  2. Is the user presented with customized content based on previous sessions?
  3. Is the user presented with navigational items that reduce cognitive load and aid recall?

- **Flexibility and efficiency of use**
  1. Does the user have shortcuts for easy browsing of the platform?
  2. Is the user able to tailor frequent actions without a lot of cognitive load?
  3. Is the experience customized based on personal browsing patterns?

- **Aesthetic and minimalist design**
  1. Is the user interface design simple and easy to understand?
  2. Is navigating through the pages and across tasks convenient?
  3. Does the design of the platform appeal enough to a user for them to return?

- **Help users recognize, diagnose, and recover from errors**
  1. Is the user presented with appropriate error messages at the right junctions such as with form filling?

2. Are the error messages polite, easy to understand and don’t blame the user for the error?
3. Are the errors able to guide the user to correct the error and prevent them from causing the error again?

- **Help and documentation**
    1. Is the user presented with clear steps/guidelines to use the platform?
    2. Does the user have access to documentation and FAQs with relevant topics to help reach their goal?
    3. Is the user presented with other channels of communication to inquire assistance to reach their goal?

Task 1: Code Troubleshooting

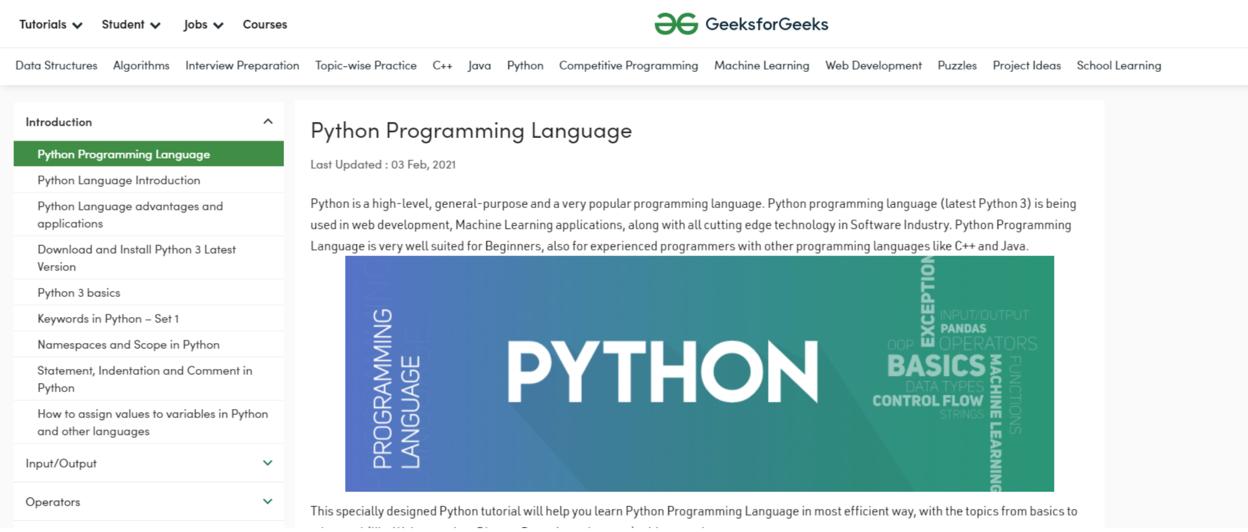
Average Rating: 0.87

Percentage Score: 28.89%

Individual Heuristic Ratings

Heuristic	Average Rating
Visibility of system status	1.67
Match between system and the real world	1
User control and freedom	1.67
Help and documentation	1
Help users recognize, diagnose, and recover from errors	0
Aesthetic and minimalist design	0
Flexibility and efficiency of use	0.67
Recognition rather than recall	1
Error prevention	1.33
Consistency and standards	0.33

Observations



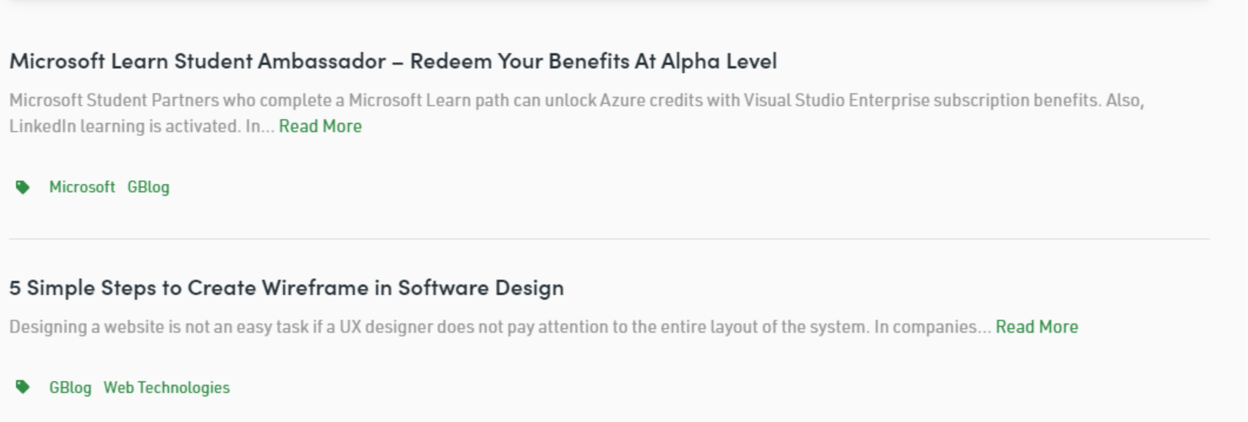
Python Programming Language

Last Updated : 03 Feb, 2021

Python is a high-level, general-purpose and a very popular programming language. Python programming language (latest Python 3) is being used in web development, Machine Learning applications, along with all cutting edge technology in Software Industry. Python Programming Language is very well suited for Beginners, also for experienced programmers with other programming languages like C++ and Java.

This specially designed Python tutorial will help you learn Python Programming Language in most efficient way, with the topics from basics to

- The only way one can tell they are on a particular language page is by repeated use of the languages name in copy, which also increases redundancy. There is no way to identify which part of the website was clicked prior to the page.



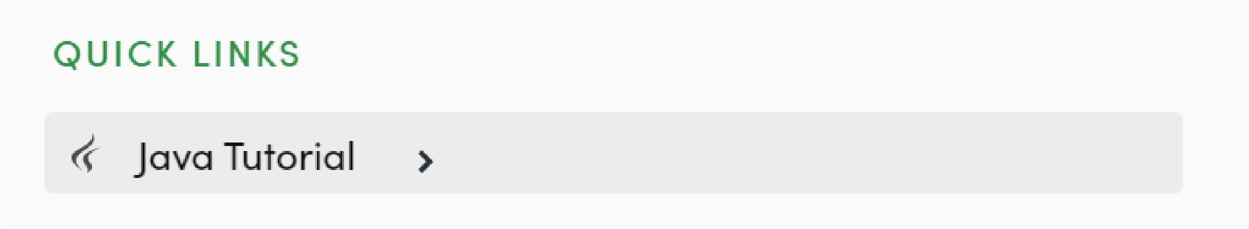
Microsoft Learn Student Ambassador – Redeem Your Benefits At Alpha Level

Microsoft Student Partners who complete a Microsoft Learn path can unlock Azure credits with Visual Studio Enterprise subscription benefits. Also, LinkedIn learning is activated. In... Read More

5 Simple Steps to Create Wireframe in Software Design

Designing a website is not an easy task if a UX designer does not pay attention to the entire layout of the system. In companies... Read More

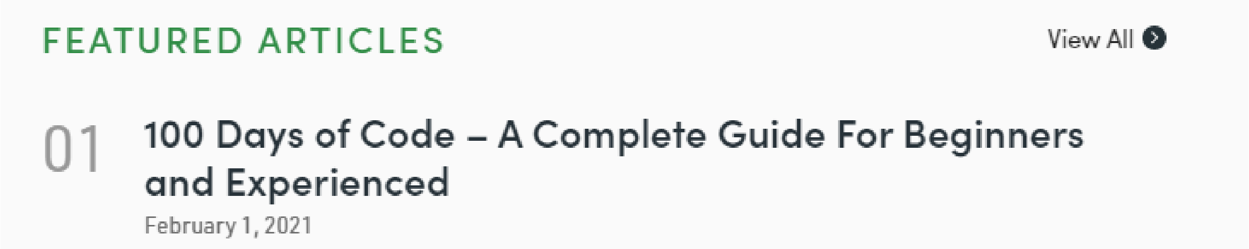
- Some UI elements may not be intuitively deemed as clickable, for instance in listings of articles, the title, read more and tags can be clicked, but not the body preview text. Ideally, the entire region should be clickable.



QUICK LINKS

Java Tutorial

Grey box highlight on hover for quick links



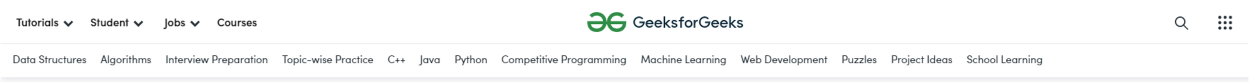
FEATURED ARTICLES

View All

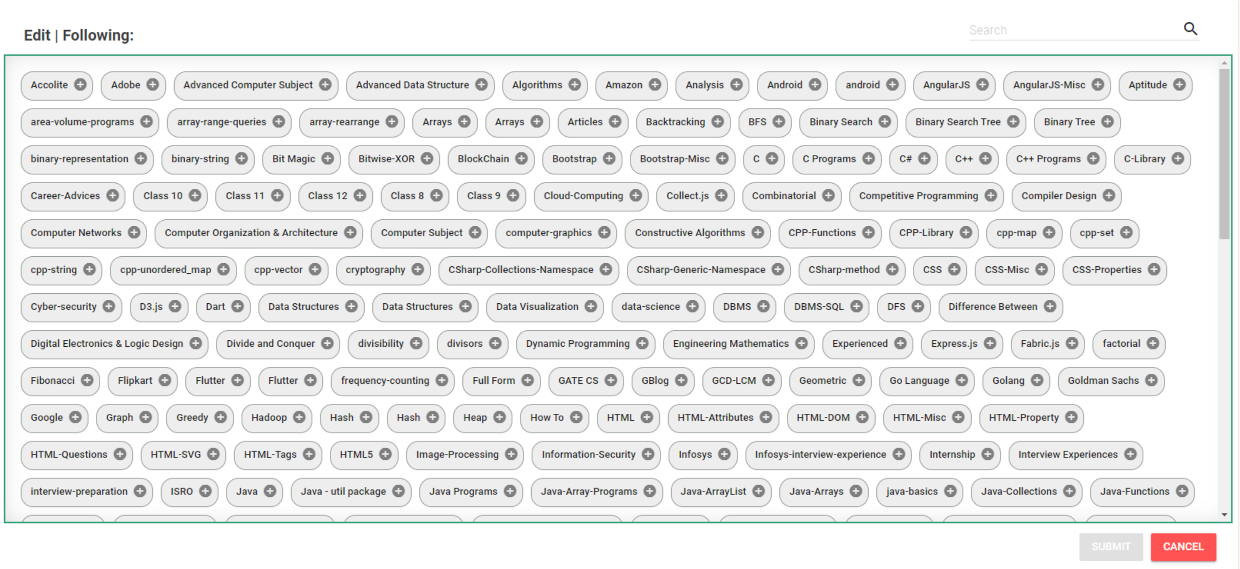
01 100 Days of Code – A Complete Guide For Beginners and Experienced

February 1, 2021

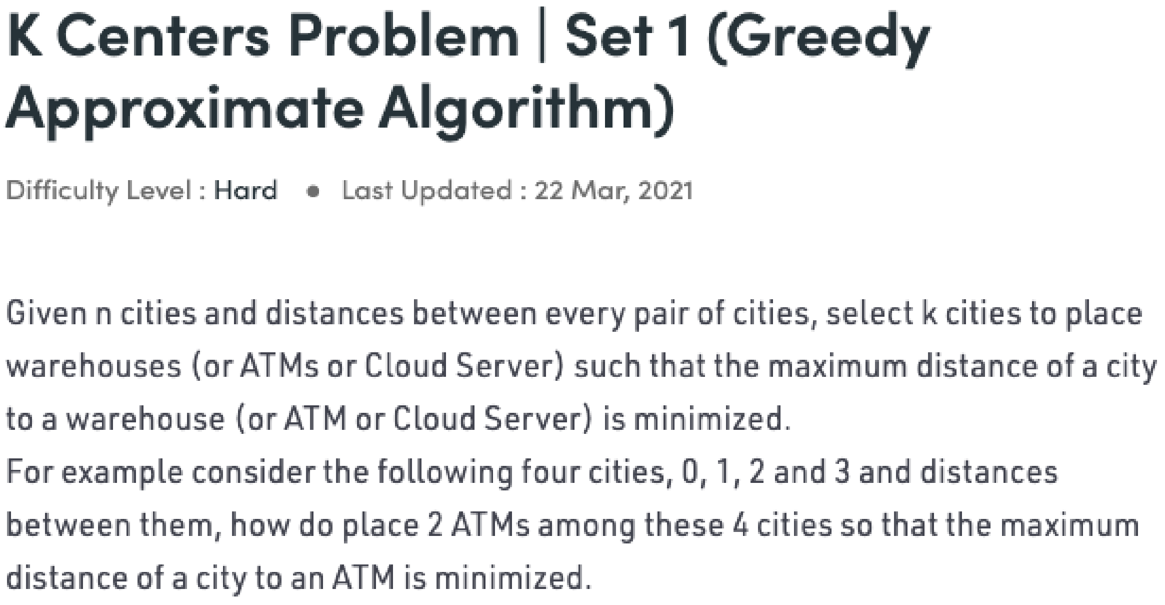
- *No highlight on hover for featured articles*
- CTA patterns vary, from green highlights on text, to grey box highlights on buttons to no feedback on article titles at all.



- High cognitive load due to a large amount of text-based options. Limited informational hierarchy makes it difficult to navigate and achieve the desired task.



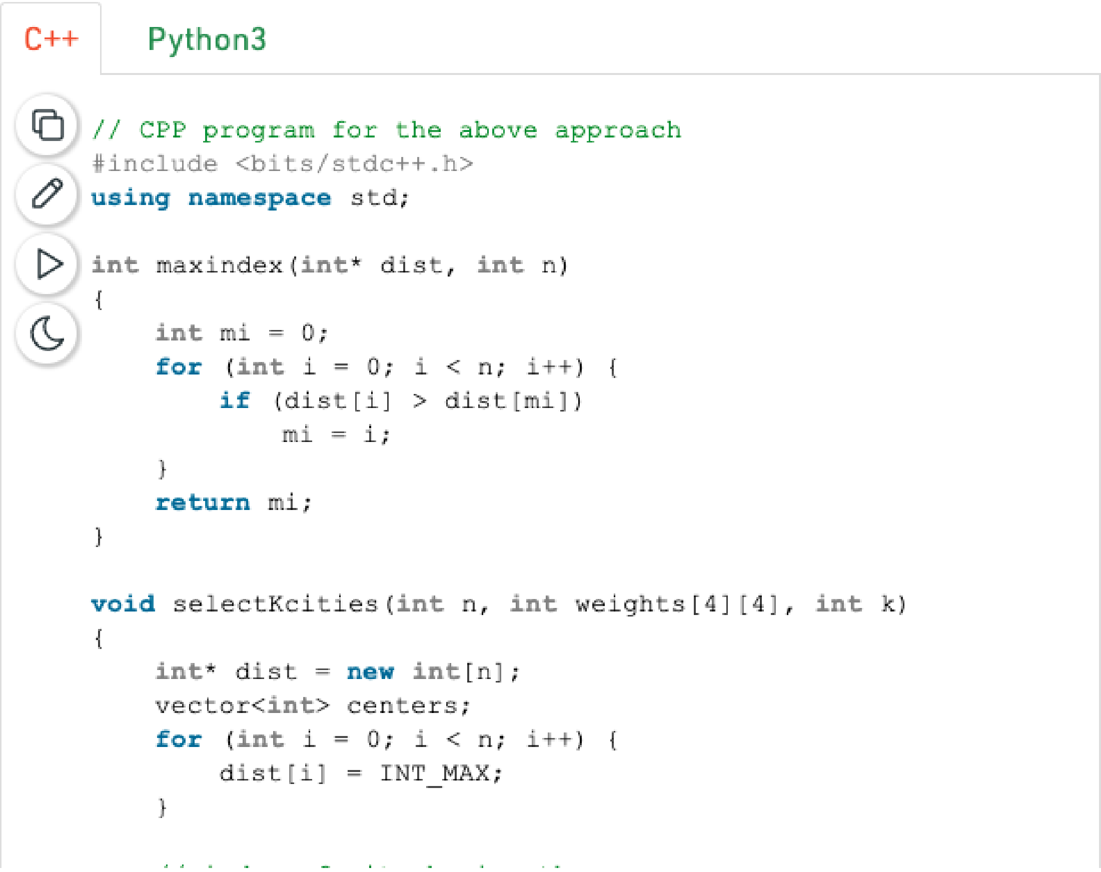
- A quick links section is provided for shortcuts and browsing. A personalization feature is available after logging in but is a tedious process involving the user selecting tags rather than automated through browsing patterns.



K Centers Problem | Set 1 (Greedy Approximate Algorithm)

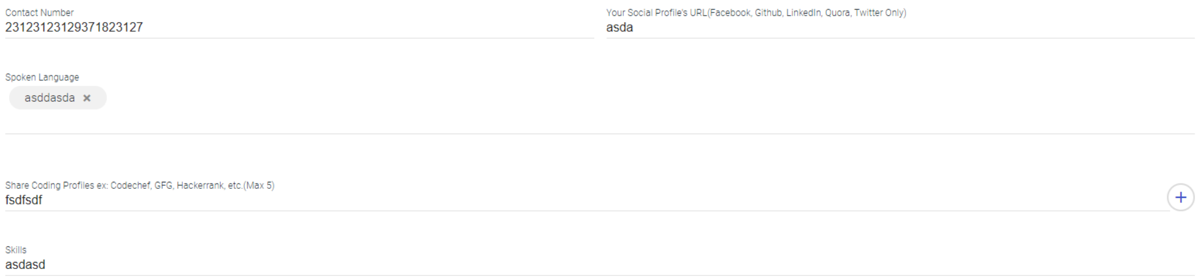
Difficulty Level : **Hard** • Last Updated : 22 Mar, 2021

Given n cities and distances between every pair of cities, select k cities to place warehouses (or ATMs or Cloud Server) such that the maximum distance of a city to a warehouse (or ATM or Cloud Server) is minimized.
For example consider the following four cities, 0, 1, 2 and 3 and distances between them, how do place 2 ATMs among these 4 cities so that the maximum distance of a city to an ATM is minimized.



```cpp
// CPP program for the above approach
#include <bits/stdc++.h>
using namespace std;

int maxindex(int* dist, int n)
{
    int mi = 0;
    for (int i = 0; i < n; i++) {
        if (dist[i] > dist[mi])
            mi = i;
    }
    return mi;
}

void selectKcities(int n, int weights[4][4], int k)
{
    int* dist = new int[n];
    vector<int> centers;
    for (int i = 0; i < n; i++) {
        dist[i] = INT_MAX;
    }
```

- It took a fair amount of effort to get a textual description of a problem that was not interactive and didn't explain the concepts behind the solution, rather providing just raw code consisting of the primary solution.



Contact Number
23123123129371823127

Your Social Profile's URL(Facebook, Github, LinkedIn, Quora, Twitter Only)
asda

Spoken Language
asddasda ✕

Share Coding Profiles ex: Codechef, GFG, Hackerrank, etc.(Max 5)
fsdfsdf

Skills
asdasd

- During profile details filling out, there seem to be no checks in place to correct errors, the platform accepts random strings or invalid inputs for fields without issue. The exception is for mobile number which only accepts integers but there is no format check.

Task 2: Topic Research

Average Rating: 0.83

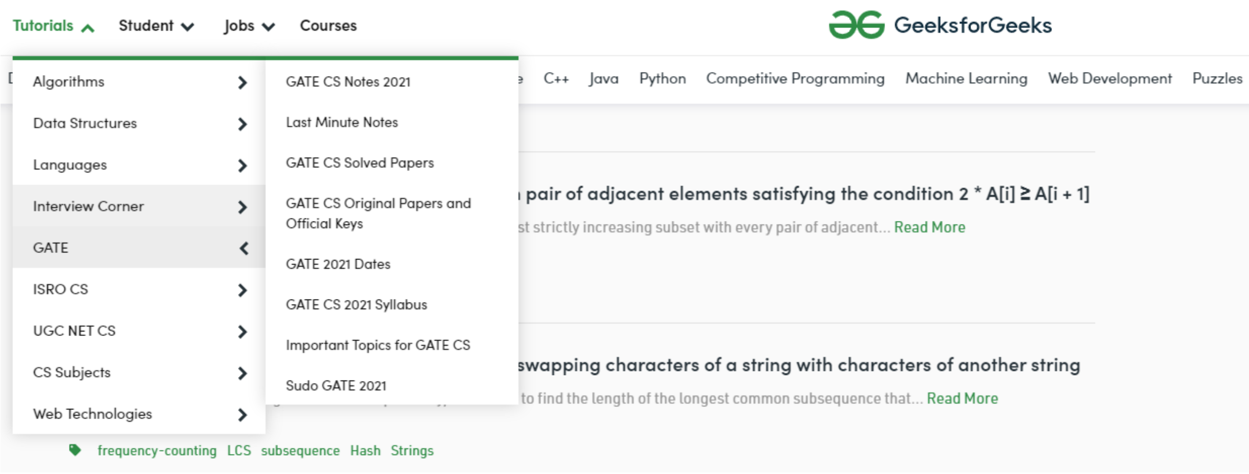
Percentage Score: 27.78%

Individual Heuristic Ratings

Aa Heuristic	# Average Rating
Visibility of system status	1
Match between system and the real world	1.67
User control and freedom	2.33
Help and documentation	1.33
Help users recognize, diagnose, and recover from errors	0
Aesthetic and minimalist design	0
Flexibility and efficiency of use	0.67
Recognition rather than recall	1
Error prevention	0
Consistency and standards	0.33

Observations*

**Due to the similarity in the UI structures encountered in both Task 1 and 2, many of the observations from Task 1 are relevant here but are omitted to avoid repetition.*



pair of adjacent elements satisfying the condition 2 * A[i] ≥ A[i + 1]

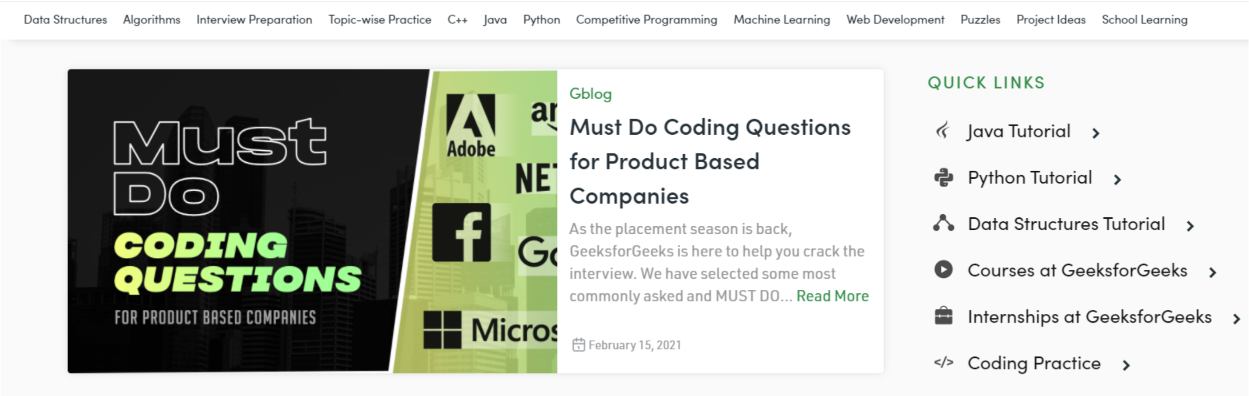
st strictly increasing subset with every pair of adjacent... Read More

swapping characters of a string with characters of another string

to find the length of the longest common subsequence that... Read More

frequency-counting LCS subsequence Hash Strings

- Though one can be there to learn, there are many acronyms used without much explanation.



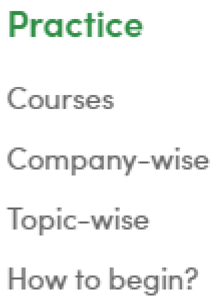
Gblog

Must Do Coding Questions for Product Based Companies

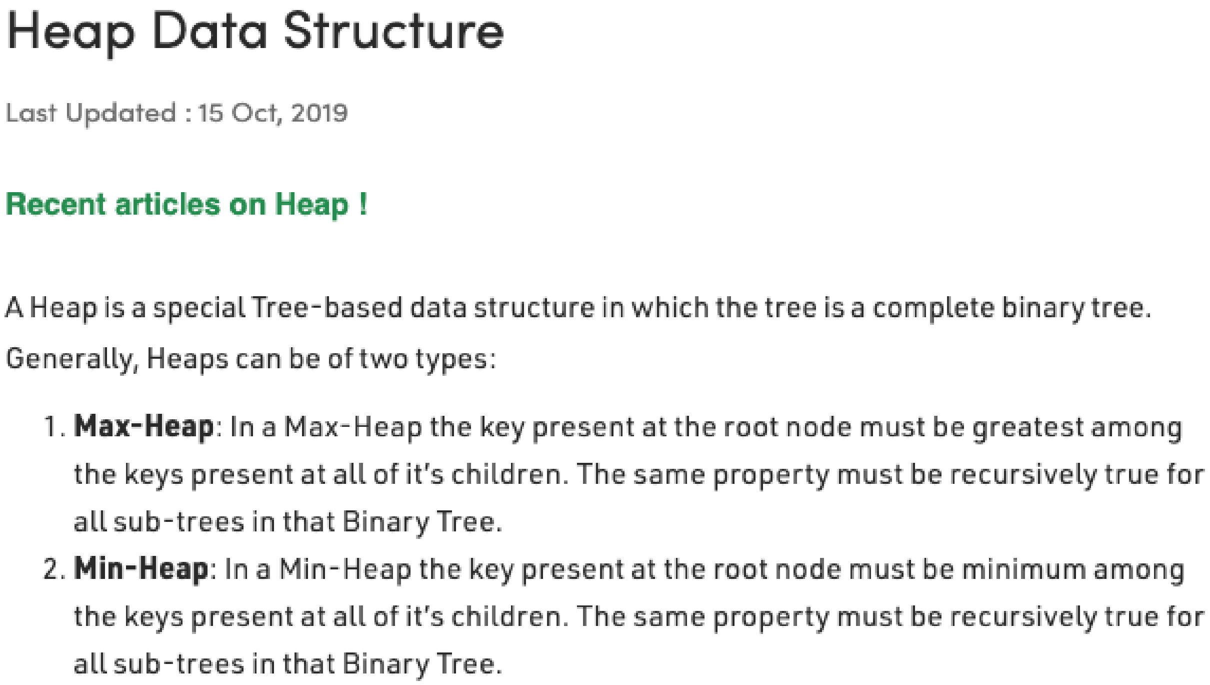
As the placement season is back, GeeksforGeeks is here to help you crack the interview. We have selected some most commonly asked and MUST DO... Read More

February 15, 2021

- *Shortcuts for all the chosen tasks were available through the Nav bar and Quick Links section*



- The only CTA for guiding the user in achieving a goal was specific to practicing coding questions and was found at the bottom of the page in the footer.



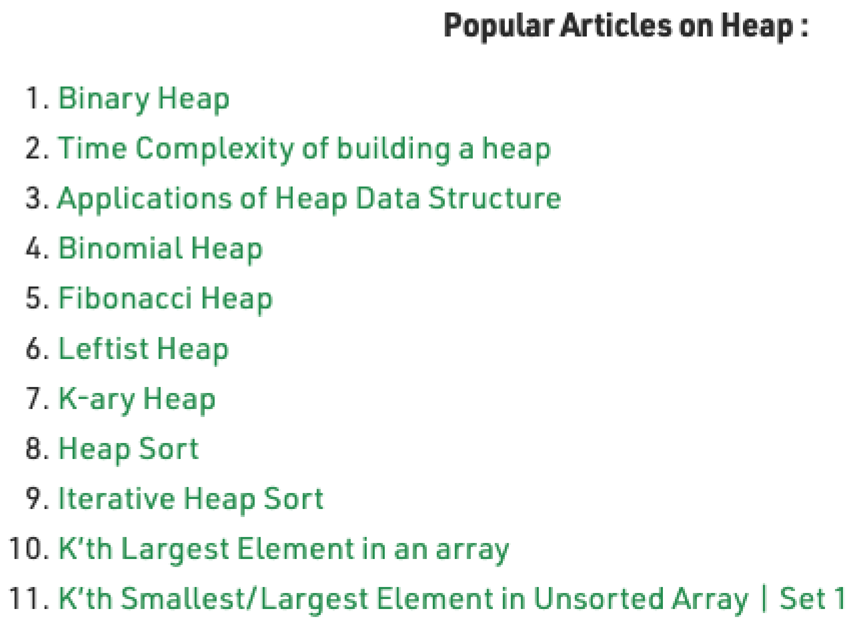
Heap Data Structure

Last Updated : 15 Oct, 2019

Recent articles on Heap !

A Heap is a special Tree-based data structure in which the tree is a complete binary tree. Generally, Heaps can be of two types:

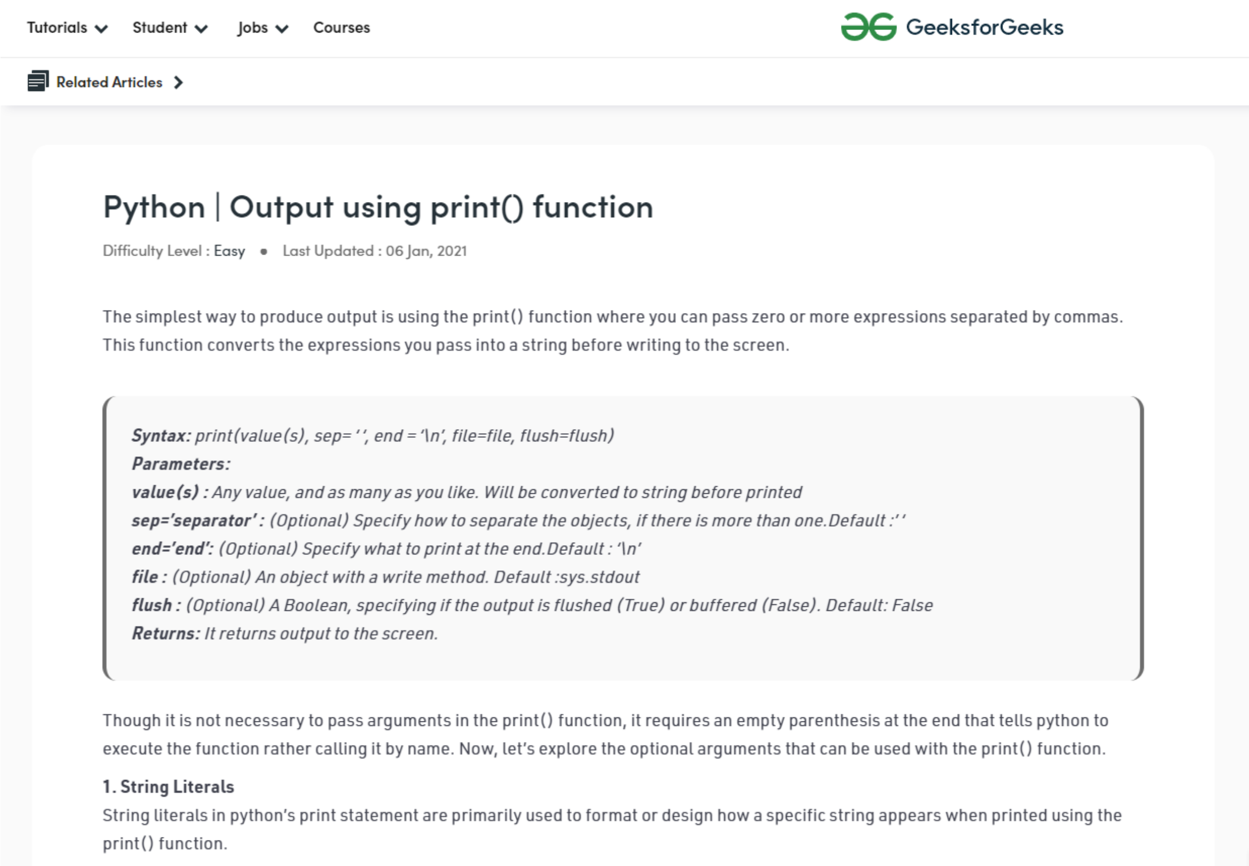
1. **Max-Heap**: In a Max-Heap the key present at the root node must be greatest among the keys present at all of it's children. The same property must be recursively true for all sub-trees in that Binary Tree.
2. **Min-Heap**: In a Min-Heap the key present at the root node must be minimum among the keys present at all of it's children. The same property must be recursively true for all sub-trees in that Binary Tree.



Popular Articles on Heap :

1. Binary Heap
2. Time Complexity of building a heap
3. Applications of Heap Data Structure
4. Binomial Heap
5. Fibonacci Heap
6. Leftist Heap
7. K-ary Heap
8. Heap Sort
9. Iterative Heap Sort
10. K'th Largest Element in an array
11. K'th Smallest/Largest Element in Unsorted Array | Set 1

- Direct navigation from the homepage to a relevant section is tricky and needs familiarity to figure out. The topics under this subject area are listed but have no order such as by difficulty or due to learning dependencies.



Python | Output using print() function

Difficulty Level : Easy • Last Updated : 06 Jan, 2021

The simplest way to produce output is using the print() function where you can pass zero or more expressions separated by commas. This function converts the expressions you pass into a string before writing to the screen.

Syntax: *print(value(s), sep= ' ', end = '\n', file=file, flush=flush)*
Parameters:
value(s) : *Any value, and as many as you like. Will be converted to string before printed*
sep='separator' : *(Optional) Specify how to separate the objects, if there is more than one.Default :' '*
end='end': *(Optional) Specify what to print at the end.Default : '\n'*
file : *(Optional) An object with a write method. Default :sys.stdout*
flush : *(Optional) A Boolean, specifying if the output is flushed (True) or buffered (False). Default: False*
Returns: *It returns output to the screen.*

Though it is not necessary to pass arguments in the print() function, it requires an empty parenthesis at the end that tells python to execute the function rather calling it by name. Now, let's explore the optional arguments that can be used with the print() function.

1. String Literals
String literals in python's print statement are primarily used to format or design how a specific string appears when printed using the print() function.

- Though navigation through the website and it's interface can pose challenges, if one was to directly land on an article through a web search then the article pages themselves are simple, understandable and sufficient to warrant a return by users.

Task 3: Coding Practice

Average Rating: 1.72

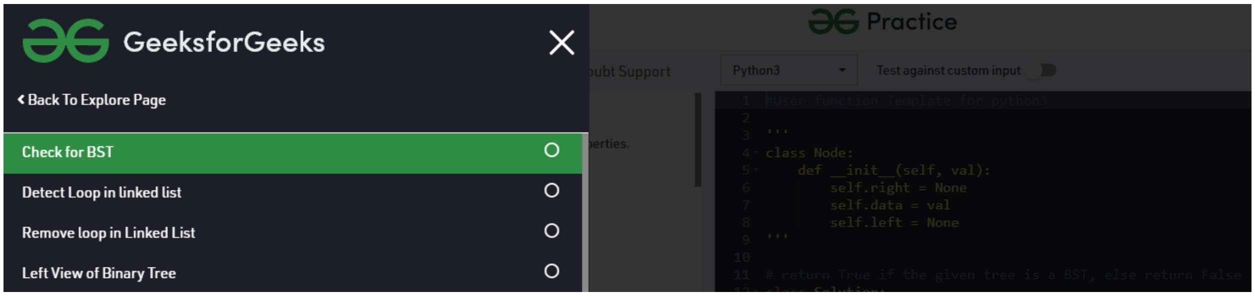
Percentage Score: 57.22%

Individual Heuristic Ratings

Aa Heuristic	# Average Rating
Visibility of system status	2

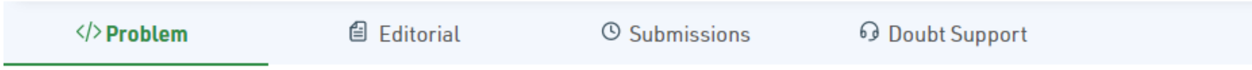
Aa Heuristic	# Average Rating
Match between system and the real world	2.67
User control and freedom	3
Help and documentation	1.67
Help users recognize, diagnose, and recover from errors	1
Aesthetic and minimalist design	0.67
Flexibility and efficiency of use	1
Recognition rather than recall	1.67
Error prevention	1.5
Consistency and standards	2

Observations

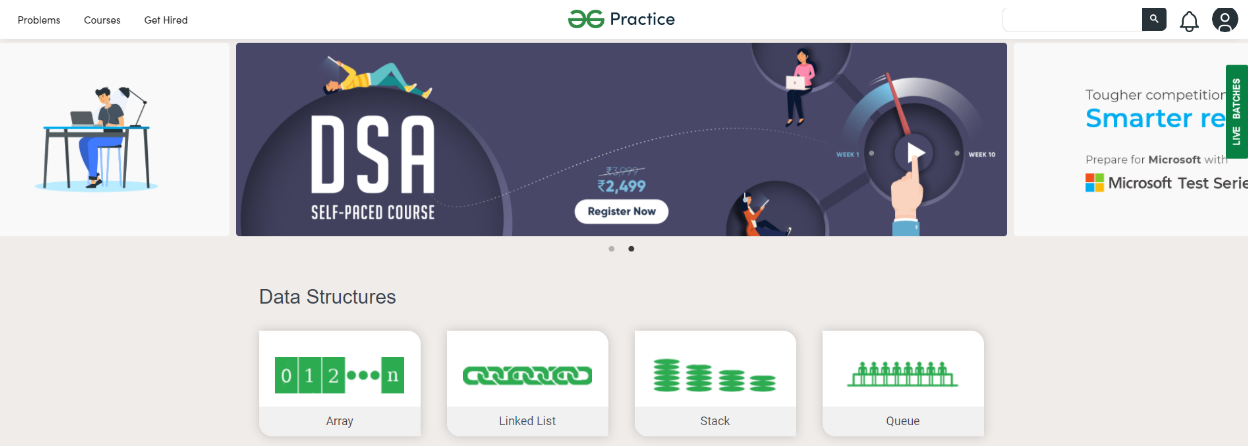

GeeksforGeeks
‹ Back To Explore Page
Check for BST ○
Detect Loop in linked list ○
Remove loop in Linked List ○
Left View of Binary Tree ○
Practice
oubt Support
Python3
Test against custom input
perties.

```
#User function Template for python3

'''
class Node:
    def __init__(self, val):
        self.right = None
        self.data = val
        self.left = None
'''

# return True if the given tree is a BST, else return False
class Solution:
```

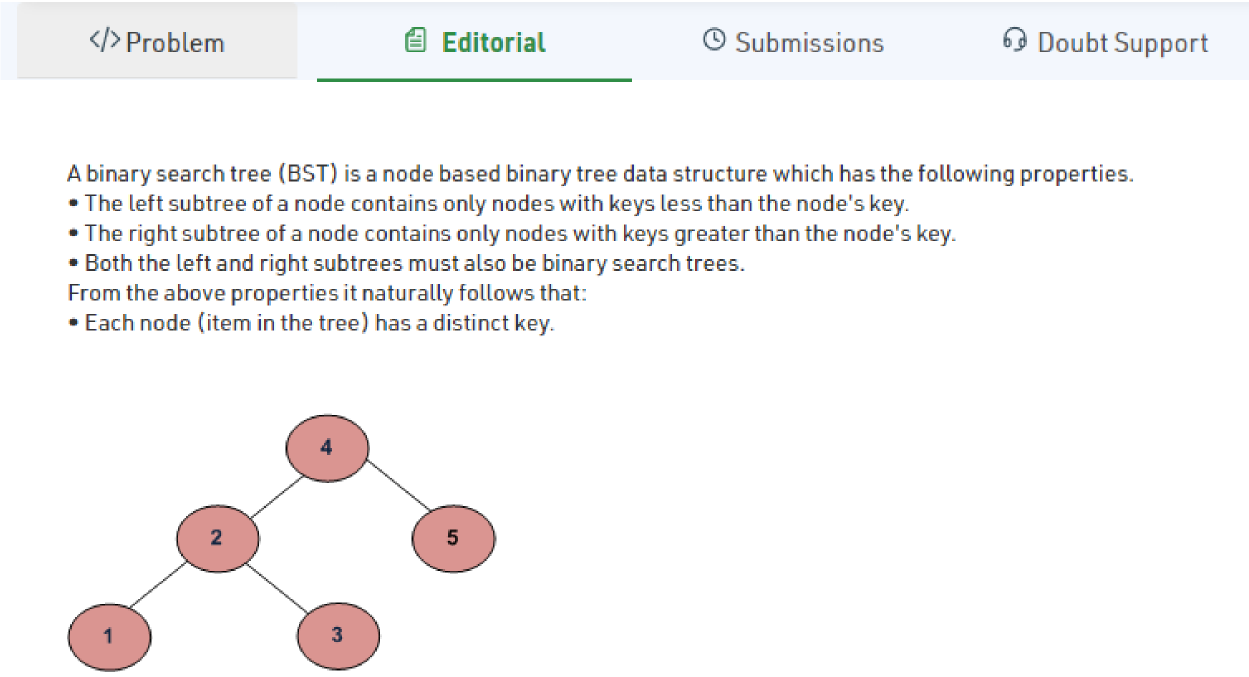
- *A hamburger menu in the practice tool allows users to go back to the explore page or directly access other problems from an overlay*



- *Practice tool nav bar does offer a simpler way to access most relevant information for the task*



- *Clicking the company logo in the practice section redirects to a different practice homepage*
- The practice platform seems to have it's own separate platform/domain so it becomes difficult for a user to identify their stage in the journey.



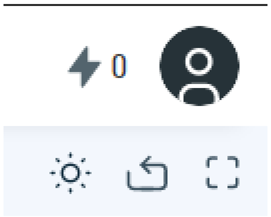
A binary search tree (BST) is a node based binary tree data structure which has the following properties.

- The left subtree of a node contains only nodes with keys less than the node's key.
- The right subtree of a node contains only nodes with keys greater than the node's key.
- Both the left and right subtrees must also be binary search trees.

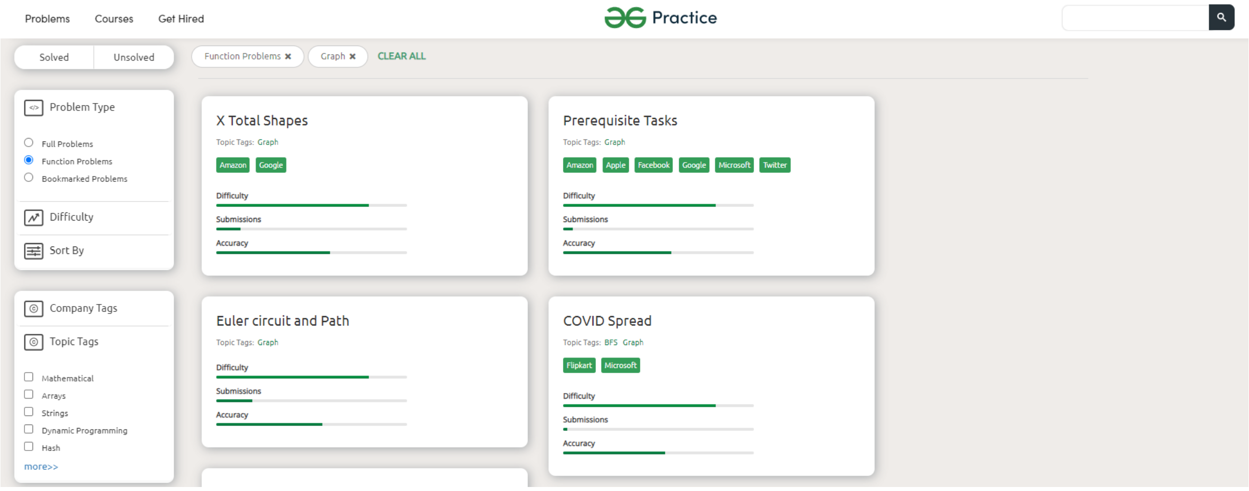
From the above properties it naturally follows that:

- Each node (item in the tree) has a distinct key.

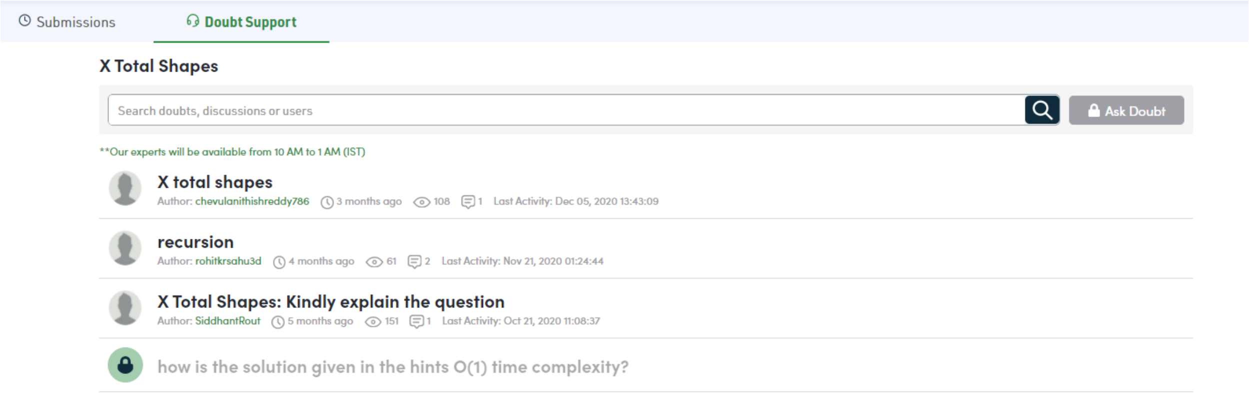
- The practice tool does provide an editorial section that does elaborate on the details of the question for easy referencing should a user need it.



- *New CTA icons with a different pattern introduced in practice tool*



- *The practice tool explore page has deep filter options without being complex*



X Total Shapes

**Our experts will be available from 10 AM to 1 AM (IST)

X total shapes
Author: chevulanithishreddy786 3 months ago 108 1 Last Activity: Dec 05, 2020 13:43:09

recursion
Author: rohitkrsahu3d 4 months ago 61 2 Last Activity: Nov 21, 2020 01:24:44

X Total Shapes: Kindly explain the question
Author: SiddhantRout 5 months ago 151 1 Last Activity: Oct 21, 2020 11:08:37

how is the solution given in the hints O(1) time complexity?

- There is a support section for users to ask questions, hints are also available to help users solve practice questions.

Task 4: Job Search

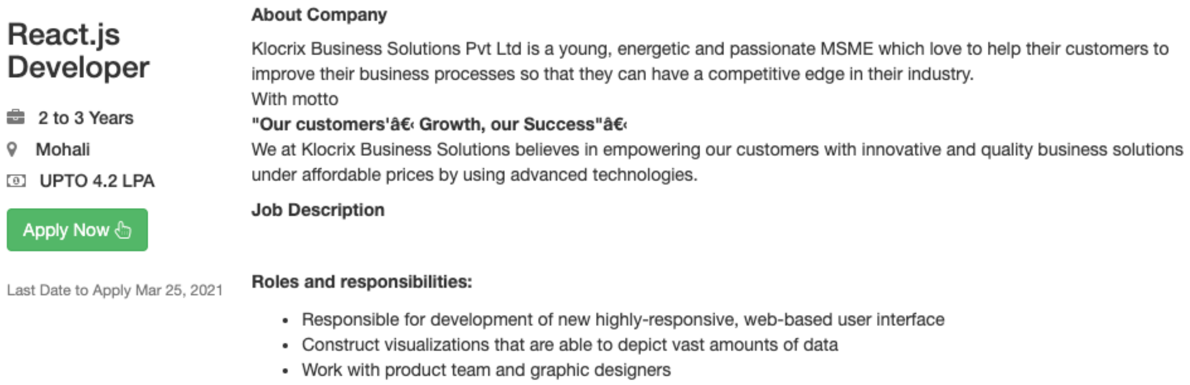
Average Rating: 1.17

Percentage Score: 38.89%

Individual Heuristic Ratings

Heuristic	Average Rating
Visibility of system status	1.67
Match between system and the real world	2
User control and freedom	2.67
Help and documentation	1.33
Help users recognize, diagnose, and recover from errors	0
Aesthetic and minimalist design	1
Flexibility and efficiency of use	0.67
Recognition rather than recall	1.33
Error prevention	0.67
Consistency and standards	0.33

Observations



React.js Developer

2 to 3 Years

Mohali

UPTO 4.2 LPA

Last Date to Apply Mar 25, 2021

About Company

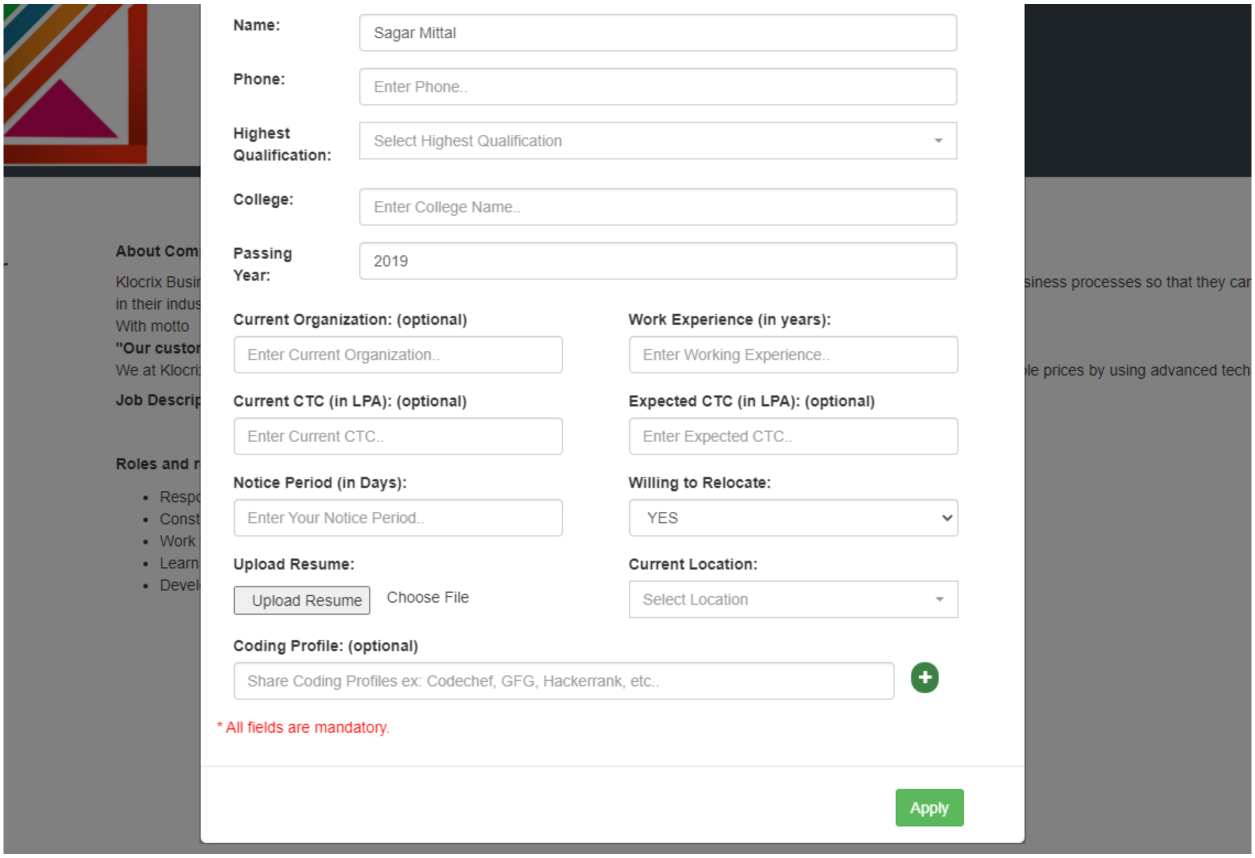
Klocrix Business Solutions Pvt Ltd is a young, energetic and passionate MSME which love to help their customers to improve their business processes so that they can have a competitive edge in their industry.
With motto
"Our customers'â€‹ Growth, our Success"â€‹
We at Klocrix Business Solutions believes in empowering our customers with innovative and quality business solutions under affordable prices by using advanced technologies.

Job Description

Roles and responsibilities:

- Responsible for development of new highly-responsive, web-based user interface
- Construct visualizations that are able to depict vast amounts of data
- Work with product team and graphic designers

- Getting to the jobs page is straight forward but thereafter it lacks many informative points such as how many applicants are interested in the position or the status of the user with regards to their eligibility for the role.



Name: Sagar Mittal

Phone: Enter Phone..

Highest Qualification: Select Highest Qualification

College: Enter College Name..

Passing Year: 2019

Current Organization: (optional) Enter Current Organization..

Work Experience (in years): Enter Working Experience..

Current CTC (in LPA): (optional) Enter Current CTC..

Expected CTC (in LPA): (optional) Enter Expected CTC..

Notice Period (in Days): Enter Your Notice Period..

Willing to Relocate: YES

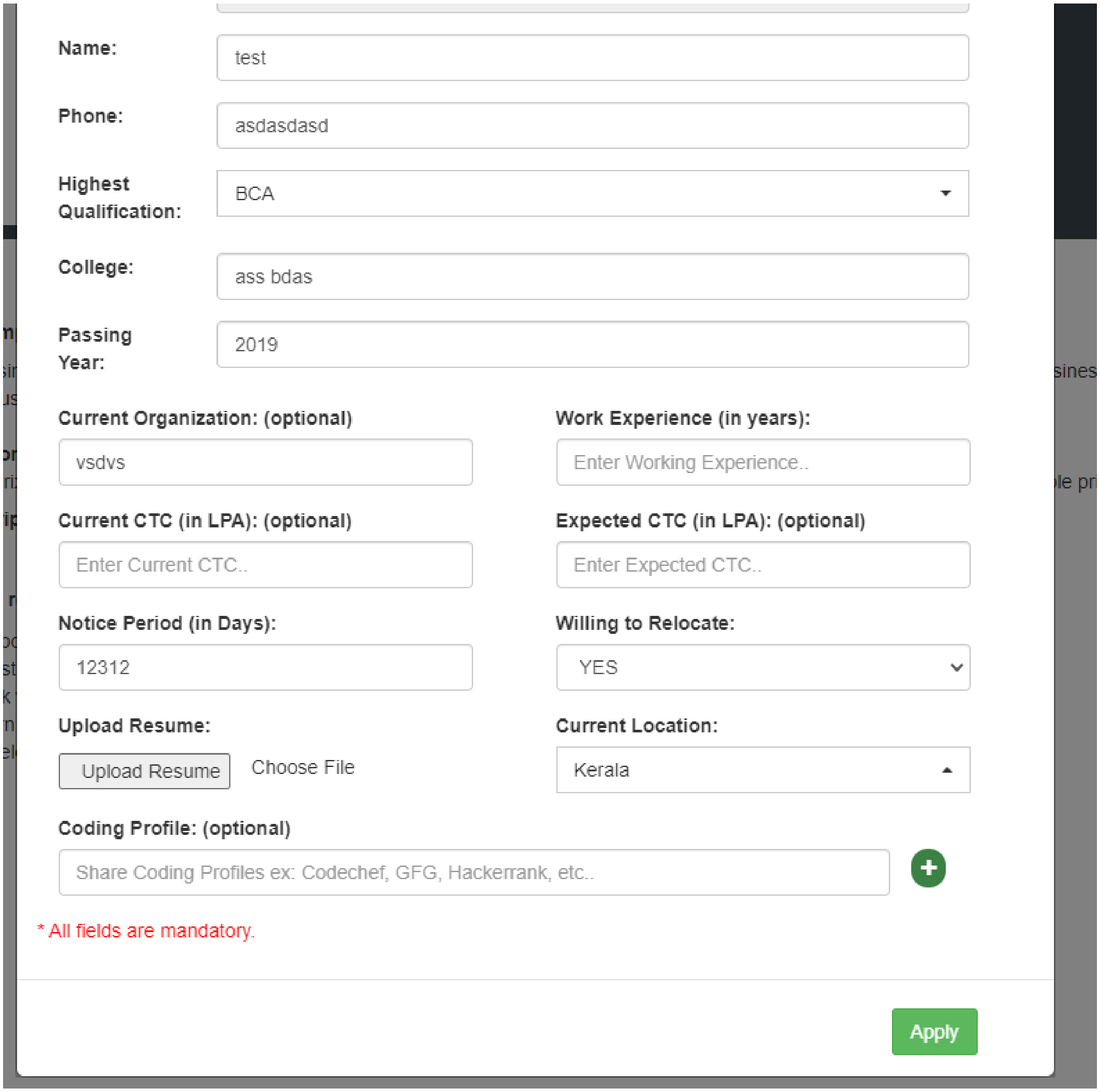
Upload Resume: Upload Resume Choose File

Current Location: Select Location

Coding Profile: (optional) Share Coding Profiles ex: Codechef, GFG, Hackerrank, etc..

* All fields are mandatory.

- The job application form is on an overlay card with a traditional form layout, mimicking its paper predecessor.



Name: test

Phone: asdasdasd

Highest Qualification: BCA

College: ass bdas

Passing Year: 2019

Current Organization: (optional) vsdvs

Work Experience (in years): Enter Working Experience..

Current CTC (in LPA): (optional) Enter Current CTC..

Expected CTC (in LPA): (optional) Enter Expected CTC..

Notice Period (in Days): 12312

Willing to Relocate: YES

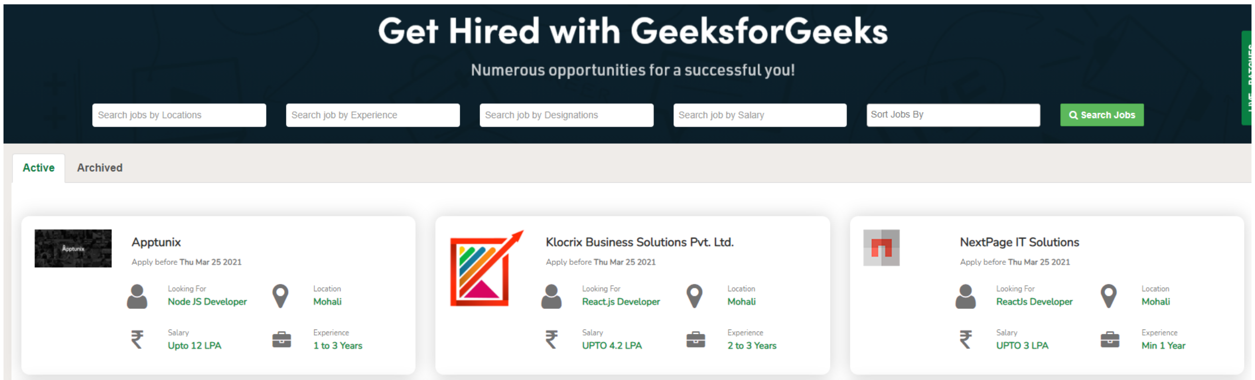
Upload Resume: Upload Resume Choose File

Current Location: Kerala

Coding Profile: (optional) Share Coding Profiles ex: Codechef, GFG, Hackerrank, etc..

* All fields are mandatory.

- Though there should be constraints or guidance on job applications to reduce errors, there is little in the way of any help. Moreover, it shows a "* All fields are mandatory" legend without marking any of the fields with an asterisk and instead labels a few as "(optional)".



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Numerous opportunities for a successful you!

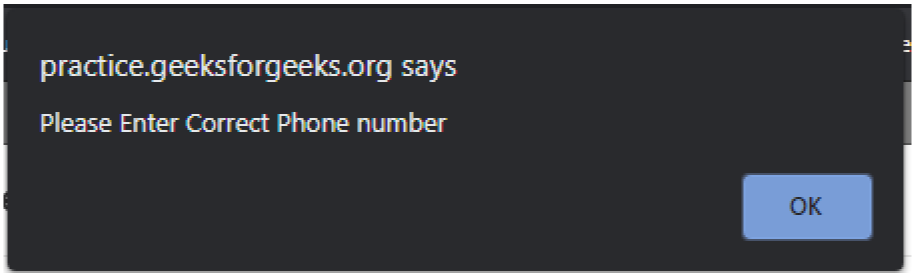
Apptunix
Apply before Thu Mar 25 2021
Looking For: Node JS Developer
Location: Mohali
Salary: Upto 12 LPA
Experience: 1 to 3 Years

Klocrix Business Solutions Pvt. Ltd.
Apply before Thu Mar 25 2021
Looking For: React.js Developer
Location: Mohali
Salary: UPTO 4.2 LPA
Experience: 2 to 3 Years

NextPage IT Solutions
Apply before Thu Mar 25 2021
Looking For: ReactJs Developer
Location: Mohali
Salary: UPTO 3 LPA
Experience: Min 1 Year

- The clearly labelled filters and card system to showcase job opportunities enables better recall.

- The difficulty of going through a job search task and application repeatedly does not seem to have been made easier by the platform. For example, each application seems to have to be re-entered rather than building an online digital resume.



practice.geeksforgeeks.org says

Please Enter Correct Phone number

- Though some errors are present during the filling of a job application form there is little in the way of a clear description of exactly what was incorrect and how the user could avoid facing an error again.

Conclusion

Given all the averaged percentages, we decided to attribute one of the 4 following 'tags of status' to each heuristic:

Strong - 80% and above

Fair - 50-80%

Weak - 30-50%

Poor - 0- 30%

Overall Heuristic Ratings and Scores

Aa Name	# Avg Rating Across Tasks	# Total Percentage Score	≡ Final Status
Visibility of system status	1.58	52.78%	Fair
Match between system and the real world	1.83	61.11%	Fair
User control and freedom	2.42	80.56%	Strong
Help and documentation	1.33	44.44%	Weak
Help users recognize, diagnose, and recover from errors	0.25	7.41%	Poor
Aesthetic and minimalist design	0.42	13.89%	Poor
Flexibility and efficiency of use	0.75	25%	Poor
Recognition rather than recall	1.25	41.67%	Weak
Error prevention	0.88	27.27%	Poor
Consistency and standards	0.75	25%	Poor
Untitled			

Overall Task Percentage Scores

Aa Name	# Avg Task Rating Across Heuristics	# Percentage Score Across Heuristics
Code Troubleshooting	0.87	28.89%
Topic Research	0.83	27.78%
Coding Practice	1.72	57.22%
Job Search	1.17	38.89%

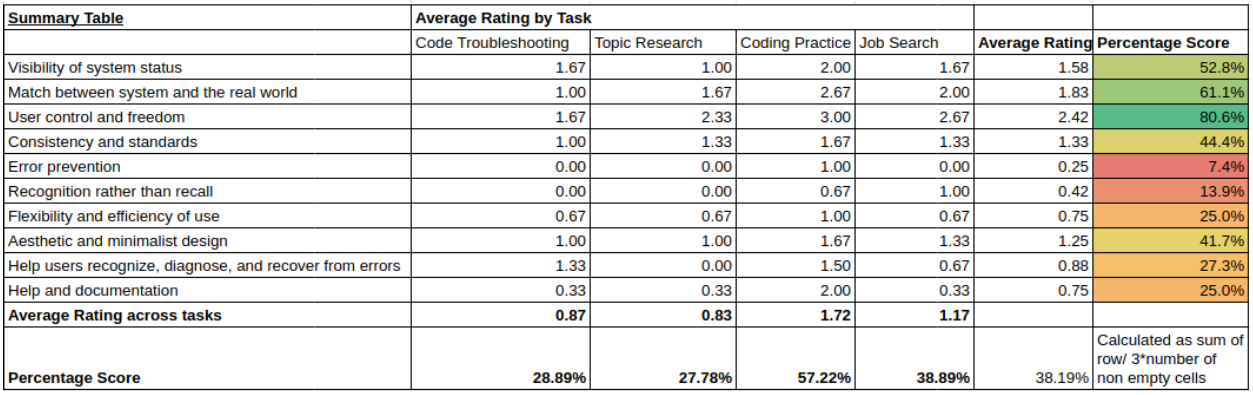
Our Two Cents:

From what we observed, GeeksForGeeks, despite being one of the most sought-after platforms for all things relevant to computing, lacks heavily in certain key aspects of our heuristics evaluation. Barring the presence of a highly neat methodology for maintaining 'User Control and Freedom', the website needs serious help in terms of its Design Consistency & Aesthetics, Flexibility of Usage, and Helping Users Recognize/Recover from Errors.

The website has been in this condition for a while, and it hasn't undergone any major design/usability touch-ups except minor add-ons. One of the possible reasons for the same could be the acclimatization of its user-base to its simplistic, non-intuitive, easy to access interface. Given the kind of audience the platform targets (young computer-science enthusiasts and early-to-mid level professionals), we suggest that the interface be made a lot less cluttered, cognitively, and a lot more intuitive/interactive aesthetically.

Appendix

Here is a screenshot of the spreadsheet we've used for evaluation. You can also access it by clicking here.



Summary Table	Average Rating by Task					
	Code Troubleshooting	Topic Research	Coding Practice	Job Search	**Average Rating**	**Percentage Score**
Visibility of system status	1.67	1.00	2.00	1.67	1.58	52.8%
Match between system and the real world	1.00	1.67	2.67	2.00	1.83	61.1%
User control and freedom	1.67	2.33	3.00	2.67	2.42	80.6%
Consistency and standards	1.00	1.33	1.67	1.33	1.33	44.4%
Error prevention	0.00	0.00	1.00	0.00	0.25	7.4%
Recognition rather than recall	0.00	0.00	0.67	1.00	0.42	13.9%
Flexibility and efficiency of use	0.67	0.67	1.00	0.67	0.75	25.0%
Aesthetic and minimalist design	1.00	1.00	1.67	1.33	1.25	41.7%
Help users recognize, diagnose, and recover from errors	1.33	0.00	1.50	0.67	0.88	27.3%
Help and documentation	0.33	0.33	2.00	0.33	0.75	25.0%
Average Rating across tasks	**0.87**	**0.83**	**1.72**	**1.17**		
Percentage Score	**28.89%**	**27.78%**	**57.22%**	**38.89%**	38.19%	Calculated as sum of row/ 3*number of non empty cells