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NPTEL (<https://swayam.gov.in/explorer?ncCode=NPTEL>) » **Programming, Data Structures And Algorithms Using Python (course)**



Course outline

How does an NPTEL online course work?

Week 1 :
Introduction

Week 1 Quiz

Week 2: Basics of Python

Week 2 Quiz

Week 2
Programming Assignment

Week 3: Lists, inductive function definitions, sorting

Week 3
Programming

Week 6 Quiz

The due date for submitting this assignment has passed.

Due on 2021-09-08, 23:59 IST.

Score: 10/10=100%

Assignment submitted on 2021-09-08, 14:58 IST

All questions carry equal weightage. All Python code is assumed to be executed using Python3. You may submit as many times as you like within the deadline. Your final submission will be graded.

Note:

- If the question asks about a value of type string, remember to enclose your answer in single or double quotes.
- If the question asks about a value of type list, remember to enclose your answer in square brackets and use commas to separate list items.

1) Suppose u and v both have values of type set and are disjoint. Which of the following expressions evaluates to True?

2.5 points

- ☐ $u == v \mid (u \wedge v)$
☐ $u == (v \wedge u)$
☒ $u == v \wedge (u \mid v)$
☐ $u == u \wedge (v \mid u)$

Yes, the answer is correct.

Score: 2.5

Feedback:

Check set theoretically.

Accepted Answers:

Assignment

Week 4: Sorting, Tuples, Dictionaries, Passing Functions, List Comprehension

Week 4 Quiz

Week 4 Programming Assignment

Week 5: Exception handling, input/output, file handling, string processing

Week 5 Programming Assignment

Week 6: Backtracking, scope, data structures; stacks, queues and heaps

Week 6 Quiz

Quiz: Week 6 Quiz (assessment? name=118)

Week 7: Classes, objects and user defined datatypes

Week 7 Quiz

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$$u == v \wedge (u \mid v)$$

2) Suppose u and v both denote sets in Python. What is the most general condition that guarantees that $u \mid v == u \wedge v$? **2.5 points**

- ☒ The sets u and v should be disjoint.
- ☐ The set u should be a subset of the set v .
- ☐ The set v should be a subset of the set u .
- ☐ This is true for any u and v .

Yes, the answer is correct.

Score: 2.5

Feedback:

$u \wedge v$ has all elements that are in exactly one of u or v . This is the same as $u \mid v - u \wedge v$. Since $u \wedge v = u \mid v$, we have $u \wedge v$ is empty, so u and v are disjoint.

Accepted Answers:

The sets u and v should be disjoint.

3) Consider the min-heap [15, 27, 33, 39, 66, 39, 47, 58, 51]. built by repeatedly inserting values into an empty heap. Which of the following *could not* have been the last element inserted into this heap? **2.5 points**

- ☐ 27
- ☐ 15
- ☒ 58
- ☐ 51

Yes, the answer is correct.

Score: 2.5

Feedback:

The last position added was the one containing 51. The last element added must lie on the path from 51 to the root: {15, 27, 39, 51}.

Accepted Answers:

58

4) Consider the min-heap [13, 24, 32, 32, 41, 38, 50, 48, 40] built by repeatedly inserting values into an empty heap. Suppose the last value inserted was 24. What was the heap structure before this value was inserted? **2.5 points**

- ☐ [13, 32, 32, 41, 40, 38, 50, 48]
- ☐ [13, 41, 32, 40, 32, 38, 50, 48]
- ☐ [13, 32, 32, 48, 41, 38, 50, 40]
- ☒ [13, 32, 32, 40, 41, 38, 50, 48]

Yes, the answer is correct.

Score: 2.5

Feedback:

Push 24 down the path towards the last leaf 40. Swap 24 with 32 and then with 40.

Accepted Answers:

[13, 32, 32, 40, 41, 38, 50, 48]

