

21286

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Group A Assignment-1

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Problem Statement -

In a second year Engineering class group A student plays Cricket group B student plays badminton and group C student plays football write a python program using function to compare

- list of student who play both Cricket and badminton
- list of student who play Cricket or badminton but not both
- no of student who play neither Cricket nor badminton
- no of student who play Cricket and football but not badminton

Objective:-

To understand Concept and operation of set to understand primitive function of list data structure in python

Outcome :-

To impliment list data structure in python.

To write menu driven modular prog. in python

2/200
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To implement user defined function in python.

* S/W requirement -
programming lang:- python.
operating system:- 64 bit Fedora
programming tools:- Jupyter notebook.

* H/W requirement.
machine used for carrying operation

Company Name:- Lenovo
intel Core i5-8260U CPU@1.60GHz
64 bit O.S. x64 based processor.

* Theory:-

Data structure Used:- List.

python list is most versatile data type in python which can be written as list of comma separated values (item) between square bracket.

important thing in the list is that items in a list need to be same type.

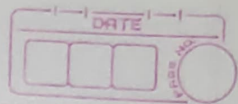
list 1 = [1, 2, 3, 4, 5]

o/p list 2 = ['a', 'b', 'c', 'd']

list 1[0] = 1

list 2[2] = c

creating classes -



21236

(2)

class Employee :

employee Count = 0

def __init__ (self, name, salary)

self.name = name

self.salary = salary

Employee employeeCount += 1

~~def~~

def displayCount (self)

print ("Total Employee", EmployeeCount)

def displayEmployee (self)

print ("Name:", self.name)

• Creating instance object

To Create instance of the class we call the class using class name and pass in whatever argument it's __init__ method accepts.

• Accessing attribute :

We can access method of object attribute using (.) operator with object. class variable could be accessed using class name as follows

emp1.displayEmployee (self)

emp2.displayEmployee (self)



Sets:-

A set is a unordered & unindexed collection of elements. Addition, subtraction, union, intersection are various operations performed on sets. Sets are defined using curly brackets and elements are separated by comma.

Operation on sets.

1. Intersection.

Intersection of set is denoted by symbol \cap the intersection $A \cap B$ is defined as the set composed of all element that belongs to both A & B.

$$A = \{2, 3, 4, 5\}$$

$$B = \{3, 4, 6, 7\}$$

$$A \cap B = \{3, 4\}$$

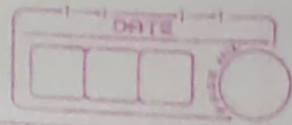
2. Union of set.

Union of set is denoted by symbol \cup the union of A and B define as set that consist all elements of set A and set B.

$$A = \{2, 3, 4, 5\}$$

$$B = \{3, 4, 6, 7\}$$

$$A \cup B = \{2, 3, 4, 5, 6, 7\}$$



6 ADT:-

ADT Set is

Object or Value definition: A Finite Collection of zero or more element.

Functions:-

For all $S \in \text{Set}$ and item $e \in \text{element}$.
add Ele(set , item) : Void.

// add unique item to set.

union(set , set) : Set

// returns union of two set.

Intersection(set , set) : Set

// returns intersection of two set.

Difference(set , set) : Set

// returns diff of two set.

display(set) : Void

// display item/element in set.

End set.

* Algorithm (pseudocode)

1) Union of two set:- $\text{Union}(S_1, S_2)$

1. Begin
2. For $i = 1$ to $S_1.\text{length}()$
3. $S_3.\text{addelement}(S_1[i])$
4. endfor
5. For $i = 1$ to $S_2.\text{length}$
6. if $S_3.\text{pin}(S_2[i])$
7. Pass
8. else
9. $S_3.\text{addelement}(S_2[i])$
10. endfor
11. return S_3
12. endfor. stop

2) Intersection of two set.

 $\text{Intersection}(S_1, S_2)$

1. Begin
2. For $i = 1$ to $S_1.\text{length}()$
3. if $S_1[i]$ is present in S_2
4. $S_3.\text{add}(S_1[i])$
5. endfor.
6. return S_3
7. stop.

3) Function to determine is element is present in list or not.
 $\text{Pin}(\text{value}) \rightarrow \text{Present in.}$

Pin(list, ele)

```

1  for i=1 to list.length()
2  if list[i] == ele
3      return True
4      break.
5  else:
6      return False
7  break end for.
8  end.

```

4)

DIFF OF set.

DIFF.(S₁, S₂)

1. Begin

2. for i=1 to S₁.length()

3. if (Pin(S₂, S₁[i]) == false)

4. S₃.add(element(S₁[i]))

5 end for.

6 ~~stop~~

7 return S₃

8 end.

9. Test Cases

Case No	Input Values	Output Values
1	Cricket = [2, 3, 4, 6]	i) [3, 4]
	Badminton = [3, 4, 6, 7]	ii) [2, 6, 6, 7]
	Football = [4, 5, 7, 8]	iii) [8]
		iv) [2, 5, 6]
2	Cricket = [1, 2, 4, 6]	i) [2, 4]
	Badminton = [2, 4, 6, 8]	ii) [1, 6, 6, 8]
	Football = [3, 5, 7, 9]	iii) [3, 7, 9]
		iv) [1, 5, 3, 7, 9]

10. Application

- 1] For Creating oop based application to store all data of various type of categories and also analyse the data.
- 2] Explain Various Concept regarding class and object and set operation.

11. Conclusion

In this Assignment 1, I have implemented the concept of class, object, attributes, union, intersection, set operations for object oriented programming in python.