

Lab 11: Python

ESS 112 - Programming I

International Institute of Information Technology – Bangalore

Submission: LMS by 7 Feb 23:59:59

Submission Instructions: Submit your code in a separate file on LMS.

Exercises:

1. Write a python program to create a Vehicle class with max_speed(km/hr), seating capacity and mileage(km/lt) instance attributes. Create a Bus child class that inherits from the Vehicle class. The default fare charge of any vehicle is seating capacity * 200. If Vehicle is Bus instance, we need to add an extra 5% on full fare as a maintenance charge. So total fare for bus instance will become the final amount = total fare + 5% of the total fare. The main reads the standard input and processes each line as follows:
Name of the bus, max_speed, seating capacity and mileage separated by space
E denotes the end of input. Each bus final amount should be printed at the end of input in separate line.

Sample Input:

```
A 100 50 5
B 80 100 6
E
```

Sample Output:

```
A 10500
B 21000
```

2. Write a python program which implement a class "Rectangle" in Python that has the following:
 - two private instance variables `length` and `width`
 - a method `area` that returns the area of the rectangle
 - a method `perimeter` that returns the perimeter of the rectangle
 - a method `from_square` that returns a rectangle object with sides of equal length (i.e. a square)
 - a destructor that prints a message "An instance of Rectangle has been deleted" when an instance of the class is deleted

Note: You must destroy all objects at the end of execution of this program.

Sample Input:

10 5

Sample Output:

50 30

100 40

3. You are given a list called my_list. Using this list, you must create a tuple called my_tuple. The tuple will contain the list's first element, last element, and the length of the list, in that same order.

Sample Input:

10 20 "Python" 17 "Programming"

Sample Output:

(10, 'Programming', 5)

4. Write a Python program to print all unique values in a dictionary.

Sample Input:

5

A:4

B:2

C:3

D:2

E:10

Sample Output:

4 2 3 10

5. Given a dictionary (key, integer) and a number k, find the kth largest integer in the list and print the corresponding key. First line of input will contain 's' size of dictionary followed by key-value pairs in next s line. Last line of the input will contain 'k'.

Sample Input:

5

A:4

B:2

C:3

D:8

E:10

2

Sample Output:

D