10. Super Shipping

Program Name: shipping.java Input File: shipping.in

As the owner of a widget manufacturing company, you manufacture widgets, process orders, and make shipments. Each day begins at 4:00 AM and ends at 8:00 PM (two shifts). Due to an overzealous janitorial staff, unfilled orders and unshipped widgets from previous days are lost, but at the beginning of each new day a fresh set of orders arrive.

The widget assembly line produces widgets at a rate of one every five minutes, and widgets are shipped by the case (9 widgets each). Partial cases cannot be shipped, so in the event that an order would result in an incomplete case, the order is increased just enough to result in a full case. For example, if an order is made for 11 widgets, two full cases of widgets must be shipped to complete it.

Write a program that calculates what time of day shipments are made to which customers. Process the orders in the sequence that they are given (i.e., no order can be filled unless all orders before it are filled).

Input

The first line of the input file will contain a single integer, *n,* indicating the number of days of operations to calculate. For each day, the first line of input will contain a single integer, *m*, indicating the number of orders for that day. The following *m* lines will each contain an order consisting of the name of the ordering city (one word) followed by the number of widgets they need.

Note, no city will have more than one order in any given day.

Output

For each day, first print a line, "Day #X" where X is 1 for the first day, 2 for the second, etc. Then, for each order in the input, determine if it can be filled. If so, display the statement, "Ship Y cases to CITY at TIME." where Y is the minimum number of cases necessary to satisfy the order and TIME is the time of day the last case is ready to ship. If the order cannot be filled, display the statement, "CITY does not get a shipment today."

Example Input File

```
2
4
Houston 15
Dallas 20
Austin 30
Tulsa 185
2
Tulsa 185
Boston 1
```

Example Output To Screen

```
Day #1
Ship 2 cases to Houston at 5:30AM.
Ship 3 cases to Dallas at 7:45AM.
Ship 4 cases to Austin at 10:45AM.
Tulsa does not get a shipment today.
Day #2
Ship 21 cases to Tulsa at 7:45PM.
Boston does not get a shipment today.
```