Performance Based Delivery System

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In this short writing, we will talk about a simple delivery system. This is something that I am building. Let's say that there are some people whose job is to deliver our products to customers. The commission for the delivery men is based on profit. In other words, the amount of commission will depend on the type of product (and the quantity) that they deliver. There will be times when they only make pennies. Of course, in other situations they can receive a good amount of commission. The purpose of this system is to ensure the person who are willing to deliver items with a small profit will get a bigger chance to deliver highly profitable items in the next orders.

As it is web based, the system is written in PHP and MySQL. This is just a rough design so that the details may be different than the one presented here. However, you get the idea.

```
TABLE: transaction
COLUMNS:
-orderID: Order ID
-ordercom: The commission of this order.
-delID: The person who delivered the item.

TABLE: deliverer
COLUMNS:
-delID: The IDs of the deliverers
-delLow: The number of deliveries with low commission
-delHigh: The number of deliveries with high commission
```

When an order is placed by a customer, the system will first calculate the commission. Based on that, it will then determine the deliverer who should be prioritized to take the task. The priority is calculated based on the previous performance of the deliverers. For the very first order, the system will give a message to all of the delivery men. It is up to them whether or not they will take the delivery task.

Here is the calculation:

```
average commission = total amount of commission / total number of order

commission level = commission for the particular order / average commission

threshold = 5 (up to you)
```

If the commission level is higher than threshold, the order is considered 'high'. Otherwise it is considered 'low'.

For calculating the performance of each of the deliverers, low commission level is given a higher weight than high commission level.

```
low level weight = 2 (up to you)
high level weight = 1 (up to you)

performance = (number of deliveries with low level commission * low level
weight) + (number of deliveries with high level commission * high level weight)
```

The results of the performance calculation are then ranked. If the commission level for the particular order is considered 'high', the deliverer with the highest performance will be prioritized. He will be given a message. If there is no confirmation within a certain amount of time, the task will be offered to the next person with the second best performance, and so on. The opposite applies.

The Code

An order is placed by a customer. Let's say that the commission of this particular order has been calculated and the data type for the column *orderID* is integer with auto increment.

```
$order_commission = xyz;

//The data is saved into the table <i>transaction</i>.
$handle = $dbcon->prepare('INSERT INTO transaction (ordercom) VALUES (?,?)');
$handle->execute([$ordercom]);
```

Now it is the time to calculate the average commission.

```
//fetch the commission data and calculate total commission.
$handle = $dbcon->prepare('SELECT ordercom from transaction');
$handle->execute();
$rows = $handle->fetchAll();

$total_commission = 0;
foreach ($rows as $row){
    $total_commission = $total_commission + $row[0];
}

//get total number of order
$handle = $dbcon->prepare('SELECT MAX(orderID) FROM transaction');
$handle->execute();
$row = $handle->fetch();
$total_order = $row[0];

//calculate the average commission.
$average_commission = $total_commission / $total_order;
```

Now, it is the time to determine the commission level.

```
$threshold = 5;
$commission_level = $order_commission / $average_commission;

$level = '';
if($commission_level >=  $threshold){
    $level = 'high';
}else{
    $level = 'low';
}
```

Next, calculate the performance of each of the deliverers.

```
//prepare the array for storing the performance values of the deliverers.
$count = $dbcon->query('SELECT count(*) FROM deliverer')->fetchColumn();
$del_array = array($count);

$handle = $dbcon->prepare('SELECT (delID,delLow,delHigh) FROM deliverer');
$handle->execute();
$rows = $handle->fetchAll();

$low_weight = 2;
$high_weight = 1;

$idx = 0;
foreach ($rows as $row){
    $performance = ($row[1] * $low_weight) + ($row[2] * $high_weight);
    $del_array[$idx] = array($row[0],$performance);
    $idx = $idx + 1;
}
```

Finally, rank the performance values.

```
//a function for sorting multidimensional array (highest to lowest)
function compare_arrays($first_array,$second_array){
    if($first_array[1] < $second_array[1]){
        return 1;
    }else if($first_array[1] > $second_array[1]){
        return -1;
    }else if($first_array[1] == $second_array[1]){
        return 0;
    }
}

usort($myarray,'compare_arrays');
```

The deliverer for the task is then chosen based on the rank. An email message can be sent to him.
