

- General instructions:

==>> Open the program in eclipse or other IDE for JAVA

==>> Start a new project and copy my code in a new class file.

==>> Run the program, and results should be in the console window

==>> There should be one table, it is the answer each query.

- Data Structures:

HashMap: a data structure used to implement an associative array, a structure that can map keys to values.

Chosen reason: Considering the mapping between product and corresponding values, using HashMap can easily find relations.

- Description of Algorithm:

Pseudo code for sdap1:

```
initiate classes, HahsMap and arguments for different kinds of information;
while(has next row from database) {
    get information of this new row;
    if(product exists){
        find the same product in record;
        if(new quant < record Min) {update the Min value; }
        if(new quant > record Max) {update the Max value; }
        sum = sum + quant;
        number + 1;
    }
    else{add new product information; }
}
print table;
```

Pseudo code for sdap2:

```
initiate classes, HahsMap and arguments for different kinds of information;
while(has next row from database) {
    get information of this new row;
    get values from outer value;
    if(outer value is null) {add new outer value;}
    get values from inner value;
    if(inner value is null) {add new inner value;}
    if(state is CT){
        if(2000<=year<=2005 ){
            if(new quant > record Max)
                update CT_MAX information;
        }
    }
    }else if (state is NY){
        if(new quant < record Min)
            update NY_MIN information;
    }
    }else if(state is NJ)
```

```
        if(new quant < record Min)
            update NY_MIN information;
    }
    get inner HashMap;
    get outer HashMap;
}
print table;
```