Marking guide:

There are 13 \* N marks in total in this assignment where N = 4. **1. Smell detection (4 \* N marks) 16 marks**1) Identification of N bad smells in the programs provided. For the sake of learning, please try to identify different types of bad smells. (4 marks)2) The location of each bad smell identified (4 marks)  
3) And discussion on the reasons why you think that the ones you identify are bad smells in a  
concise fashion. Please do not simply copy general reasons from somewhere and paste them  
in your submission (4 marks)  
4) And brief discussion on the refactoring strategies/ approaches you are going to use to remove each bad smell (4 marks)  
Please document the bad smells in the following format:  
Name: <e.g., duplication>  
Location: <packageName/folderName>-<moduleName/fileName>-<className>-  
<methodName>-<between Line XXX and XXX>  
Reasons:  
1. …  
2. …  
…  
Strategies/ approaches: <e.g., extract method>  
Note: marks are for the number of bad smells correctly identified and sound reasons.

**2. Tests development (4 \* N marks) 16 marks**  
1) To develop a set of tests for the methods/ classes/ modules/ packages encompassed by the bad smells you previously identified (3 \* N marks) **12 marks**  
2) Please also use coverage package to generate a HTML report in order to show your code  
branch coverage == 100%. And all tests should be able to be run together by running a single  
.py file (N marks) **4 marks**  
Note: your testing code needs to pass PEP8 check as well.

**3. Refactoring (5 \* N marks) 16 marks**In order to remove the bad smells that you previously identified, you need to follow the  
refactoring process that we discussed in class sessions.  
1) Identifying the worst smell and the reasons why it is the worst one (N marks) **4 marks**  
2) Version control via a remote repository and testing (N marks) **4 marks**  
3) Modification to remove the worst smell and PEP8 validation (2 \* N marks) **4 marks**  
4) Effectively evaluations (N marks) **4 marks**  
Note: removing a single bad smell often requires a number of refactoring cycles. During a cycle, a small modification should be implemented. After each implementation, you need to make a “commit” to your remove repository, e.g., GitHub, for version control.  
In your repository, it is better that you have a document to briefly step by step explain your  
refactoring process for each individual bad smell identified and a discussion on how well you  
remove the bad smells (e.g., has the bad smells successfully been removed at the end? Did you bring new bad smells into the program? How well is your program now in terms of software quality?)  
Your source code needs to pass PEP8 check.