IT2154 Tutorial 9: Imperative vs Functional Programming in Python

Question 1

Name one key difference between *imperative* programming and *declarative* programming.

Question 2

Name one declarative programming language that you have encountered before.

Question 3

Rewrite the following Python code in imperative style.

```
from functools import *

students = [ {"name": "Seah Bo Keng", "score": 0, "status" : "withdraw" },
             {"name": "Sum Ting Wong", "score": 79, "status" : "enrolled" },
             {"name": "Annie How", "score": 80, "status" : "enrolled" },
             {"name": "Lee Kum Kee", "score": 90, "status" : "enrolled" } ]

r1 = filter(lambda s:s["status"] != "withdraw", students)
r2 = list(map(lambda s:s["score"], r1))
r3 = reduce(lambda x,y: x+y,r2) / len(r2)
```

Question 4

Identify the problem with the following Python program, and explain why it is a problem.

```
from functools import *
fruits = [("apple", 1), ("apple", 2), ("banana", 10), ("pineapple", 1)]
empty_order = { "apple":0, "banana":0, "pineapple":0}

order = reduce(lambda d,p: d[p[0]] = d[p[0]] + p[1], fruits, empty_order)
```

Question 5

Can you propose one way to fix the error found in question 4?