Practice Quiz 6

The first few questions refer in part to the following class:

```python
class Person:
    def __init__(self, name):
        self.name = name
        self.friends = []

    def __str__(self):
        result = self.name + "'s friends: "
        for f in self.friends:
            result = result + f.getName() + " "
        return result

    def getName(self):
        return self.name

    def getFriends(self):
        return self.friends

    def numFriends(self):
        return len(self.friends)

    def hasFriend(self, name):
        for f in self.friends:
            if f.getName() == name:
                return True
        return False

    def addFriend(self, friend):
        # only add a friend if they aren't already a friend
        if not self.hasFriend(friend.getName()):
            self.friends.append(friend)
        # friendship is mutual
        if not friend.hasFriend(self.name):
            friend.addFriend(self)
```

1. Given the following code fragment, show the value and type of the expressions below just prior to the completion of the main program:

```
def main():
    p1 = Person("Harry")
    p2 = Person("Hermoine")
    p3 = Person("Ron")

    n = p1.numFriends() #draw stack just before this returns
    print "Initial number of friends:", n

    p1.addFriend(p2)
    p1.addFriend(p3)

    print p1
    print p2
    print p3

main()
```

```
Expression                      Value                           Type
----------                      -----                           ----
(1)  str(p1)
(2)  p1.getName()
(3)  p1.getFriends()
(4)  p3.hasFriend("Harry")
(5)  p2.numFriends()
```

2. Using the main program from the previous question, trace through the execution of the program showing both (1) the output and (2) the stack contents. Draw the stack right before the return statement in `numFriends` is executed.

3. Write a class to represent a sports team. Each team should have a name and record the total number of wins and losses. Initially, each team should have 0 wins and 0 losses. Write code for methods `__init__`, `__str__`, getName, getWins, getLosses, `wonGame`, `lostGame`, and `getWinningPercentage`. The methods `wonGame` and `lostGame` should increment the team's wins or losses, respectively, by one. `getWinningPercentage` should return the percentage of games won out of the total number of games played. If a team has played 0 games, report the winning percentage as 0.0.

4. Write a short `main` function to create one team object and test your methods. Show any output of your function.