**Problem Set 2, Problems 0, 1, and 2**

**Problem 0: Reading and response**

*Put your response to the reading below.*

1. *What was the most interesting or important idea in this article for you – and why?*
2. *What is an application that (in your opinion) Watson's technology might be able to contribute to? Alternatively, do you feel Watson's capabilities will not make much of an impact?*
3. *Whether or not you had the chance to interact with Watson, comment on your sense of the similarities and/or differences between Watson-style and human-style thinking.*

From the article, I think the most interesting idea is that we are one step closer to the movie, "Star Trek." By IBM made the artificial intelligent computer, Watson, which answers the question from j*eopardy,* we can actually invent computer, which we can actually talk to and question us again if they need additional information to give us the answer. I think the great application of Watson is education. Think about how young kids ask questions to us. If Watson answers them and guides them to think properly, then it would be awesome. It will have huge impact on us. I never had interacted with Watson, but I have Siri on my phone. If I compare to Siri to Human then I think Siri still need more development to be better at understanding such as different language for multi-language speakers, the ton of the speaker to catch up with the mood, or the timeline or time.

**Problem 1: Tracing function calls**

`global variables`

| **a** | **b** | **c** | **d** |
|---|---|---|---|
| 3 | 5 | 2 | 4 |
| 3 | 5 | 2 | 7 |
| | | | |
| | | | |

`hello's local variables`

| **a** | **b** | **c** | **d** |
|---|---|---|---|
| 3 | 5 | 2 | 4 |
| 3 | 5 | 7 | 4 |
| 3 | 5 | 7 | 6 |
| | | | |

`goodbye's local variables`

| **a** | **c** | **b** |
|---|---|---|
| 5 | 4 | |
| 5 | 4 | 7 |
| | | |
| | | |

`adios's local variables`

| **a** | **b** | **c** | **d** |
|---|---|---|---|
| 5 | 5 | 4 | 4 |
| 3 | 4 | 5 | 5 |
| | | | |
| | | | |

output (the lines printed by the program)

```
3 5 2 4
5 5 4 4
3 4 5 5
Hello 3 5 7 6
3 5 2 7
```

**Problem 2: Thinking recursively**

**2-1)**

```
mystery(0, 9)
-------------
    a = 0
    b = 9
    myst_rest = mystery(1, 7) = 15
    return b + myst_rest = 9 + 15 = 24

    mystery(1, 7)
    -----------------
        a = 1
        b = 7
        myst_rest = mystery(2, 5) = 8
        Return b + myst_rest = 7 + 8 = 15

           mystery(2, 5)
           -----------------
               a = 2
               b = 5
               myst_rest = mystery(3, 3) = 3
               return b + myst_rest = 5 + 3 = 8

                      mystery(3, 3)
                      -------------
                      a = 3
                      b = 3
                      return 3
```

**2-2) 24**

**2-3) 4 stack frames**

**2-4) (4, 5) would be in an infinite loop. Because it doesn't reach the base case. a and b would never be the same even if a is added by 1 and b is subtracted by 2.**