Mastery Check 2

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| Topic | Level | Question |
| Environment Model | Fundamental | What is the main idea of environment model ? What is an environment and bindings ? |
| Environment Model | Fundamental | What are the cases where we need to extend an environment ? And what is the correct what to extend it ? |
| Environment Model | Fundamental | How do we find the value of a variable using the environment model ? |
| Environment Model | Intermediate | Why do we need environment model when we have substitution model ? Give an example where the substitution model fails! |
| Environment Model | Intermediate | Excluding empty frames and global environment, how many environments are created within the execution of the following programme ? Can you draw it ? |
| Environment Model | Advanced | Excluding empty frames and global environment, how many environments are created within the execution of the following programme (adapted from the lecture) ? Can you draw it ? |
| Memoization | Fundamental | What is memoization and why do we need memoization ? |
| Memoization | Fundamental | What are the conditions or types of problems that we can solve with memoization ? |
| Memoization | Fundamental | How do we implement memoization in general, and how do we memoize functions such as stream ? |
| Memoization | Intermediate | Consider given an image made of 1 and 0, given in the following function    And we want to find the number of ones in a certain row of the image and the function getOnes would be called multiple times, how will you solve this problem with and without memoization ? |
| Memoization | Intermediate | Given the memoize function in your lecture, why the following code would still give exponential runtime ? |
| Memoization | Advanced | Explain how memoization works on Stream and functions as given in the lecture! You can refer to Environment model advanced question to solve this question too! |
| Memoization | Advanced | What are the difference in memoizing results from bottom-up and top-down approach in solving problems (Most notably in dynamic programming) ? How will you memoize the results in these two cases ? |
| Streams | Fundamental | What is the definition of stream ? Is this a stream  Const maybe\_stream = pair(1, (x) => pair(x, null)); |
| Streams | Fundamental | What is the difference between stream and list, and in what aspects they are similar too ? |
| Streams | Intermediate | What is the result of the evaluation of the following code ? |
| Streams | Intermediate | Given two infinite stream, how would you interleave them together, and can you generalize the method to given a list of infinite stream ? |
| Streams | Advanced | How would you then memoize the stream in Stream Intermediate Question 1, is the following piece of code the correct way to memoize it ? |