**CS202 Assignment 1 – Shin Minchul**

[Question 1] Java Code Explanations

1. Overview of the Choose.java code

This given Java program works similar to Combination in Mathematics.

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| *Figure 1. The formula of Combination* |

Where stands for total number of objects in the set, stands for the number of choosing objects from the set. The program prints all possible subset of size r from an array e of n elements. The method “choose(int b, int c)” generates recursion to recurse all possible selection of r elements from the given n elements that is inputted by the user.

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| *Figure 2. Example output of Choose.java* |

From Figure 2, one key observation about the code is that it prints the combination of 6 Choose 3 in descending order rather than usual ascending order (0 1 2, 0 1 3, 0 1 4, …).

2. Understanding the choose Method

As the key implementation of the program is related to choose method, I will further explain about it. The method looks like working as follows:

1. It selects r elements from n.
2. If c < 0, it prints the selected subset ‘a’ array.
3. Else, it iterates over possible selsections from i = b to i < n – c.
4. Each selection in each recursive level will be stored in array a, and recursive call is made for the next element.

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| *Figure 3. Comments and explanation of what the function does* |

3. Diagram with input instance n = 6 and r = 3