**Lab # 6**

Due: 2024-11-14

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Course: CSI3120

Group: 40

**Code explanation:**

**Question 1**

The code uses different predicates to find the factorial of a positive integer. The first part checks the input is a positive integer. If it is negative, it returns an error message “Error: Input must be a non-negative integer.” The second part is the base case when the factorial of 0 is equal to TempResult. The final part multiplies Input by TempResult, decrements the input and then recursively calls the factorial predicate until Input is 0, which is the base case.

**Question 2**

The code works on lists as a filter to only allow specified elements in the output list depending on the filter. The first predicate filter\_list recursively checks each element, if the element passes the filter it is added to the result. There are other helper predicates such as check\_conditions which works by iterating through each condition, and the predicate apply\_condition converts conditions to be able to check each element. The two predicates greater\_than and multiple\_of are two mandatory conditions for this question which check if an element is greater than or a multiple of a given value.

**Question 3**

This code takes a list as input and finds the second max distinct element and returns it. First, it removes duplicates and sorts the list in ascending order. It then checks if there are at least 2 distinct elements in the list and if there is, it calls the helper predicate reverse which makes the list be in descending order. It then retrieves the second largest value as the SecondMax. In the case where there aren’t at least 2 distinct elements, the code returns an error message.

**Test cases:**

**Question 1**

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**Question 2**

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**Question 3**

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**ChatGPT declaration:** Our group used ChatGPT throughout the lab to better understand the program application so that we are able to develop our answers. ChatGPT was used for assistance to learn and understand how it worked and not to generate any answers or results. All solutions were implemented in our own words and approach.