## C++ Programming Exercise

Background  
Create a function named prepare\_recipe that is overloaded to take a character pointer to a null-terminated string of a recipe, or a string to a recipe. The recipe returns a character pointer of the prepared result from the recipe preparation steps.  In your solution both pointers and the standard template library must be used in the prepare\_recipe function. Please be creative and use classes, pointers and the Standard Template Library in the solution. If information is not included, please include assumptions and list those assumptions. Please also list out algorithmic complexity with the O(n) notation.  
  
Recipe Format  
### Ingredient1  
### Ingredient2  
Ingredient Action Ingredient. Ingredient Action Ingredient Ingredient.  
  
Preparation Steps  
• Preparation Steps are in the form of a sentence. Sentences are comprised of space-delimited words and end with a period.  
• Ingredients must match an existing element in the list from the recipe. Ingredients are in the format of a number the name without a space and then a new line.  
• The list of ingredients is given before the preparation steps.  
• The Preparation Steps will follow the ingredients list.  
• Preparation Steps are comprised of sentences.  
• Sentences require at least 1 action. All sentences must terminate with a period character.  
• An incremental positions character from the ingredient names, starting at the first character in the name and combining the resulting ingredient name with the quantities of ingredients being operated on by the defined action in the preparation step.  
• Multiple sentences have the result of the prior sentence fed in as the first value to be used in the following sentence.  
• Actions must match an action below and are mapped to mathematical operations.  
  
Actions  
• mix = add   
• chop = subtract  
• strain = divide  
• sprinkle = multiply  
• kick = bitwise and   
• smash = bitwise exclusive-or  
• destroy = remainder  
  
First example:  
prepare\_recipe("3 Boars  
5.46 BoilerPots  
BoilerPots Boars Mix."  
);  
  
Returns: "8.46 Bo"  
  
Second example:  
prepare\_recipe("1 Yak  
5 Poster  
892.111 Electromagnetic  
1.8374568 Plastic  
Poster Electromagnetic chop Plastic. Sprinkle Yak."  
);  
  
Returns: "-888.9484568 Play"  
  
Third example:  
prepare\_recipe(“0 Pop  
1 Water  
3 Ox  
Water mix Pop Ox.”  
);  
  
Returns: “Error: 1 Wo, with 3 Ox having a length of 2 characters, but the position in the Preparation Steps requires at least 3 letters.”  
  
Errors  
Unsuccessful Recipes return a character pointer to a null-terminated string. Examples of errors are:  
• Recipe is too short  
• Ingredients isn’t found or used  
• prepare\_recipe Returns a string explaining the error  
• Other errors and edge cases that are not listed