Recipe Representation:

We intend to use the following JSON template to store information parsed for any given recipe:

```
{
   “ingredients”: ‘’
      [{
         “name”: ‘’
         “quantity”: ‘’
         “measurement”: ‘’
         “descriptor”: ‘’
         “preparation”: ‘’
         “prep-description”: ‘’
         “ingredient nutrition”:
            {
               “calories”: ‘’,
               “saturated fats”: ‘’,
               “unsaturated fats”: ‘’,
               “carbohydrates”: ‘’,
               “sodium”: ‘’
            }
         }],
   “primary cooking method”: ‘’,
   “cooking methods”: [],
   “cooking tools”: [],
   “total nutrition”:
      {
         “calories”: ‘’,
         “saturated fats”: ‘’,
         “unsaturated fats”: ‘’,
         “carbohydrates”: ‘’,
         “sodium”: ‘’
      },
   “total cook time”: ‘’,
   “number of servings”: ‘’,
   “cooking steps”:
      {
         “action”: {}
         “ingredient”: {}
         “utensils”: {}
         “stop point”: {}
      }
}
```

This template is heavily based upon the template provided in the assignment sheet, with additions for nutritional information and storage for the parse of the individuals steps used to prepare the food.

Individual entities will be populated by making heavy use of hard-coded items lists (either entered manually, scraped from the web, or potentially learned by processing a large number of url’s from AllRecipes.com). In some instances, frames will be applied (using regular expressions) to identify a potential entity which will then be validated or rejected using a series of dynamic web searches to determine the type of entity. For example, if we are trying to figure out what the word “banana” means, we may try a series of searches such as “banana is a vegetable", "banana is a cooking utensil", "banana is a fruit", etc., and then use the classification which has the highest number of search results. This method may also be used in lieu of scraping.

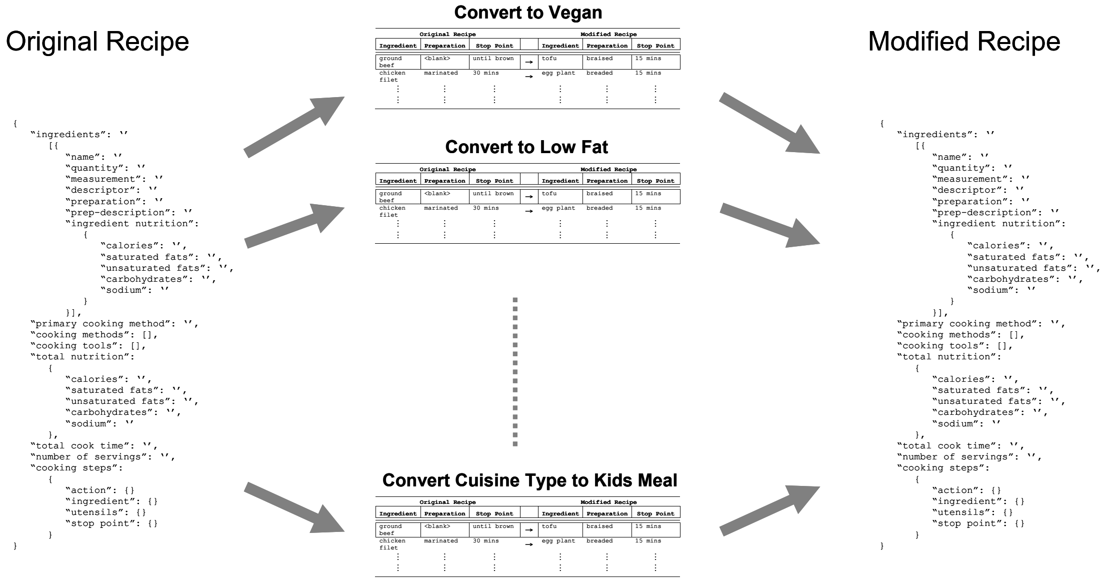
Substitution Tables:

We plan to address the tasks selected under section 3 using substitution tables. We believe that all of these tasks could be handled by substitution one ingredient for another, one action for another, etc. In certain (likely most) instances a simple substitution will not be sufficient, and other parameters of the recipe such are ingredient preparation, cooking utensils, cooking times, etc. will also need to be changed. An illustrative example for changing to a vegetarian recipe might look like:

Original Recipe				Modified Recipe		
Ingredient	**Preparation**	**Stop Point**		**Ingredient**	**Preparation**	**Stop Point**
ground beef	<blank>	until brown	→	tofu	braised	15 mins
chicken filet	marinated	30 mins	→	egg plant	breaded	15 mins
⋮	⋮	⋮		⋮	⋮	⋮
⋮	⋮	⋮		⋮	⋮	⋮

Substitution tables would be implemented as Python Dictionaries. Depending upon the specific task, there will be more or fewer columns of changes to make, and is some instances cooking steps may be deleted and/or augmented.

An overall system visual might look like:



```
{
   "ingredients": ''
      [{
         "name": ''
         "quantity": ''
         "measurement": ''
         "descriptor": ''
         "preparation": ''
         "prep-description": ''
         "ingredient nutrition":
            {
               "calories": '',
               "saturated fats": '',
               "unsaturated fats": '',
               "carbohydrates": '',
               "sodium": ''
            }
         }],
   "primary cooking method": '',
   "cooking methods": [],
   "cooking tools": [],
   "total nutrition":
      {
         "calories": '',
         "saturated fats": '',
         "unsaturated fats": '',
         "carbohydrates": '',
         "sodium": ''
      },
   "total cook time": '',
   "number of servings": '',
   "cooking steps":
      {
         "action": {}
         "ingredient": {}
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         "stop point": {}
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⋮	⋮	⋮		⋮	⋮	⋮

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⋮	⋮	⋮		⋮	⋮	⋮

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               "saturated fats": '',
               "unsaturated fats": '',
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               "sodium": ''
            }
         }],
   "primary cooking method": '',
   "cooking methods": [],
   "cooking tools": [],
   "total nutrition":
      {
         "calories": '',
         "saturated fats": '',
         "unsaturated fats": '',
         "carbohydrates": '',
         "sodium": ''
      },
   "total cook time": '',
   "number of servings": '',
   "cooking steps":
      {
         "action": {}
         "ingredient": {}
         "utensils": {}
         "stop point": {}
      }
}
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