

Team бутерброд ("sandwich" in Russian):

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Assignment 1 - PB & J Report

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### Introduction

The premise of this assignment was to create a step by step guide to making a peanut butter and jelly sandwich. Our group started by discussing what resources you would need to create the sandwich. We then decided our starting and end goal points. We tried to be as explicit and clear as we could be so there would be little room for misinterpreting the individual steps. The group then decided on preconditions and postconditions we felt were necessary to aide the process. Once we were satisfied with the completed steps we then tested them with a third party to see how the process went, what was confusing, and what could be improved upon.

### Outline of Steps

1. Get the peanut butter, jelly, and two slices of bread
  - a. Precondition: have all of the ingredients
2. Get knife and plate
  - a. Precondition: have both already
3. Apply Peanut butter to 1 slice of bread with knife
  - a. Precondition: clean the knife
4. Apply jelly to other slice of bread with knife
  - a. Precondition: clean the knife
5. Combine bread slices with condiments facing inwards
6. Cut sandwich across the diagonal with knife
  - a. Precondition: clean the knife
7. Serve the sandwich
8. Eat the sandwich/Have person eat sandwich

### Initial Data Set

Step	Time (Seconds)	Quality
1	9.17	X
2	3.66	X
3	40.70	X
4	67.33	X
5	5.98	X
6	14.72	X
7	3.02	X

8	162.99	X
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### Improvement Plan

The longest time during the process was not surprisingly the time it took to eat the sandwich. However, our focus for the improvement plan was only to reduce the second longest step, which was spreading the jelly. Eating the sandwich is not as relevant to the entire process and assignment as was spreading the jelly. In addition to updating the directions for spreading the jelly though, we also made the same update to spreading the peanut butter since they are essentially the same procedure with the exception of the actual ingredient being spread. For fun, and to improve upon an additional step, we used a cleaver in the final data set to slice the sandwich as opposed to a knife. We also deleted the last step of eating the sandwich.

#### *Improved Steps:*

1. Get the ingredients (peanut butter, jelly, and two slices of bread)
  - a. Precondition: have all of the ingredients available and enough of each ingredient & know which type of each ingredient is desired.
  - b. Postcondition: ingredients assembled and ready for use.
2. Get tools (knife and plate)
  - a. Precondition: have both already available and clean.
  - b. Postcondition: tools (knife and plate) assembled together with ingredients.
3. Put one slice of bread on the plate and apply peanut butter to 1 side with knife making sure to cover as much of the side as possible. Do this as quick as you can without making it messy.
  - a. Precondition: clean the knife, jar of PB is open
  - b. Postcondition: 1 slice has PB spread onto 1 side of it
4. Move that slice aside and put the other unused slice of bread on the plate. Apply jelly to 1 side with knife making sure to cover as much of the side as possible. Do this as quick as you can without making it messy.
  - a. Precondition: clean the knife, jar of jelly is open
  - b. Postcondition: The other slice of bread has jelly spread onto 1 side of it
5. Combine bread slices with PB & J facing inwards and trying your best to line up the edges of the bread.
  - a. Precondition: both pieces of bread are ready to be put together and you have two hands available and are capable of completing this activity
  - b. Postcondition: sandwich is now put together
6. Cut sandwich diagonally with cleaver
  - a. Precondition: cleaver is clean, you can cut it carefully enough to not go through the plate or whatever type of material you are cutting on
  - b. Postcondition: you have a sandwich with 2 triangular pieces
7. Serve the sandwich
  - a. Precondition: the sandwich is prepared and ready to be served
  - b. Postcondition: sandwich is served!

### Final Data Set

Step	Time (Seconds)	Quality
1	10.74	X
2	2.89	X
3	23.34	X
4	22.15	X
5	5.36	X
6	5.38	X
7	3.02	X

### Conclusion

As visible from the second data set, the improvements we have added to our process cut down total time markedly, with no drop in quality. The focused method of spreading on caused a drop of about 17 seconds in peanut butter application (42.7% increase in completion time) and 45 seconds in jelly application (67.1% increase in completion time), resulting in a whole minute and 2 seconds of saved time. Our original goal was to increase only by 20% but our final data set illustrates an increase that surpassed our goal. Part of this efficiency included wiping the knife on the bread slice following step 3, which turned out to be quicker than cleaning it with a paper towel, and utilized less resources. Furthermore, after step 4, the knife could be set aside entirely, and wasn't needed in step 6 due to the change of tools. The use of a larger cutting implement to slice the bread into two even halves reduced the step's time by half and resulted in a cleaner cut as well. The duration of the steps of, of course, will vary from subject to subject.