# Fuzzy sets and related topics

## Excersise 1. Answer to the question 4 of chapter 1 from the book Ross, 4th ed. 2017

The question asked us to find a membership function to terms “half-full”, “half-empty” and “full” while pointing to a glass of water.

**Answer:** The terms half-full or half-empy are ambiguous words. For example For the term “half-empty”:

* when our glass of water is full, we can assign zero value to half-empty meaning there is no have empty.
* Or if the glass is empty it’s possible to assign zero value to half-empy.

And for the term “half-full”:

* when our glass of water is full, we can assign zero value to “half-full”.
* Or if the glass is empty, again we can assign zero value to “half-full”.

With these assumptions above we can aswer the question “Does half-full and half-empty have identical membership function?” As below

Because both assumptions have same value assigned for an empty glass of water we can say that both have identical membership function. Below a triangular function is an example of membership function for these terms.

But for full we can assign another membership function such as S-type membership function.

And for conclusion it can be said that, the answer does not solve this ageless riddle.

## Excersise 2. Use a programming language to answer to the question 2 of the second chapter of Zimmermann, 4th ed, 2001 book.

**Answer:** The answer is in *main.ipynb* file or the exported form of it *main.pdf*

## Excersise 3. Which of the fuzzy sets in question 2 of the second chapter of Zimmermann, 4th ed, 2001 book, are Convex?

**Answer:** The answer is in *main.ipynb* file or the exported form of it *main.pdf*

## Excersise 4. Answer the question 2 of chapter 4 from the book Ross, 4th ed. 2017

**Answer:** The answer is in *main.ipynb* file or the exported form of it *main.pdf*

## Excersise 5. Answer Question 4 of the second chapter of Zimmermann, 4th ed, 2001 book

**Answer:** The answer is in *main.ipynb* file or the exported form of it *main.pdf*

## Excersise 6. Answer to the question 8, chapter 2 from the book Ross, 4th ed. 2017

**Answer:** The answer is in *main.ipynb* file or the exported form of it *main.pdf*