

Systems Analysis

Santa 2024

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Main points

- **INPUT:** Shuffled words
- **TASK:** Reconstruct the sequence into a passage

Objective

Input (Scrambled Words)	System Output (Reconstructed Sentence)	Perplexity Score
santa merry christmas to you	Merry Christmas to you, Santa.	8.21
night holy silent all is	Silent night, holy night, all is calm.	7.95
belts jingle the way all the on	Jingle all the way, on the bells.	9.10

Evaluation

01 Evaluation model

For each sequence in submission the perplexity

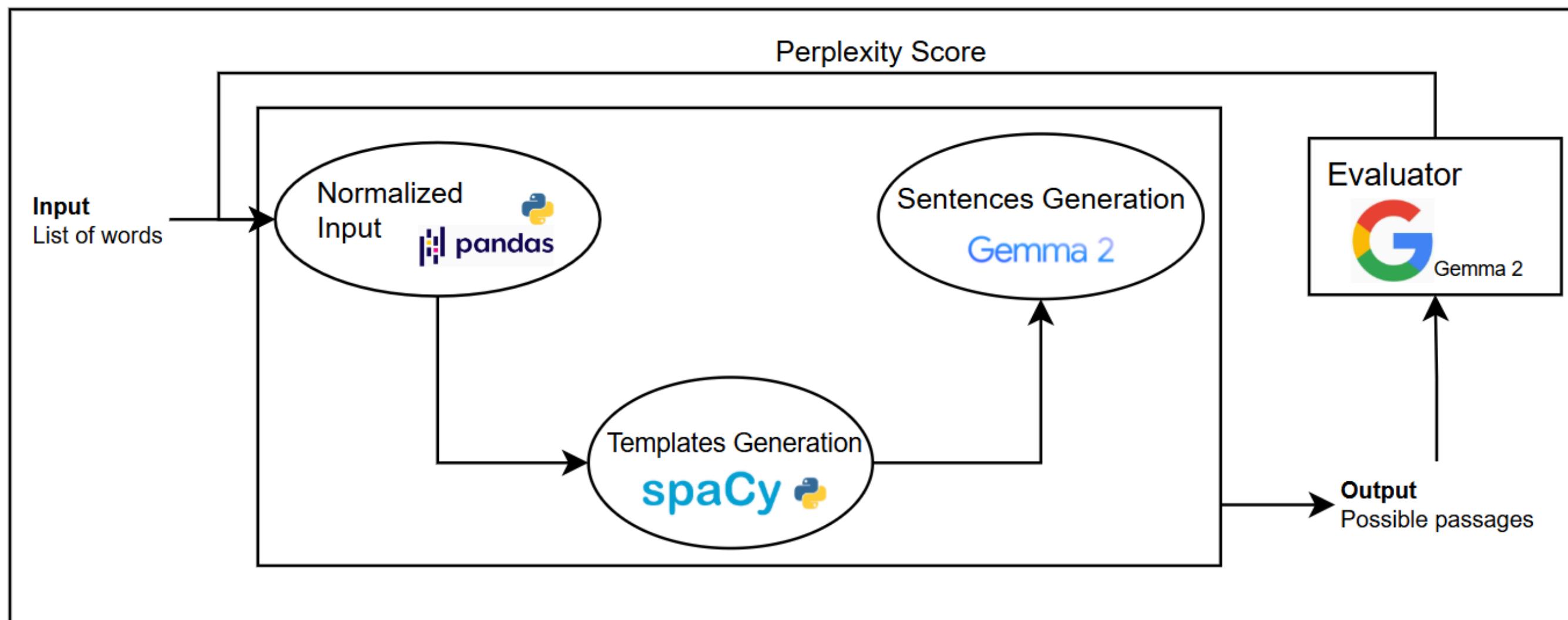
02 Perplexity



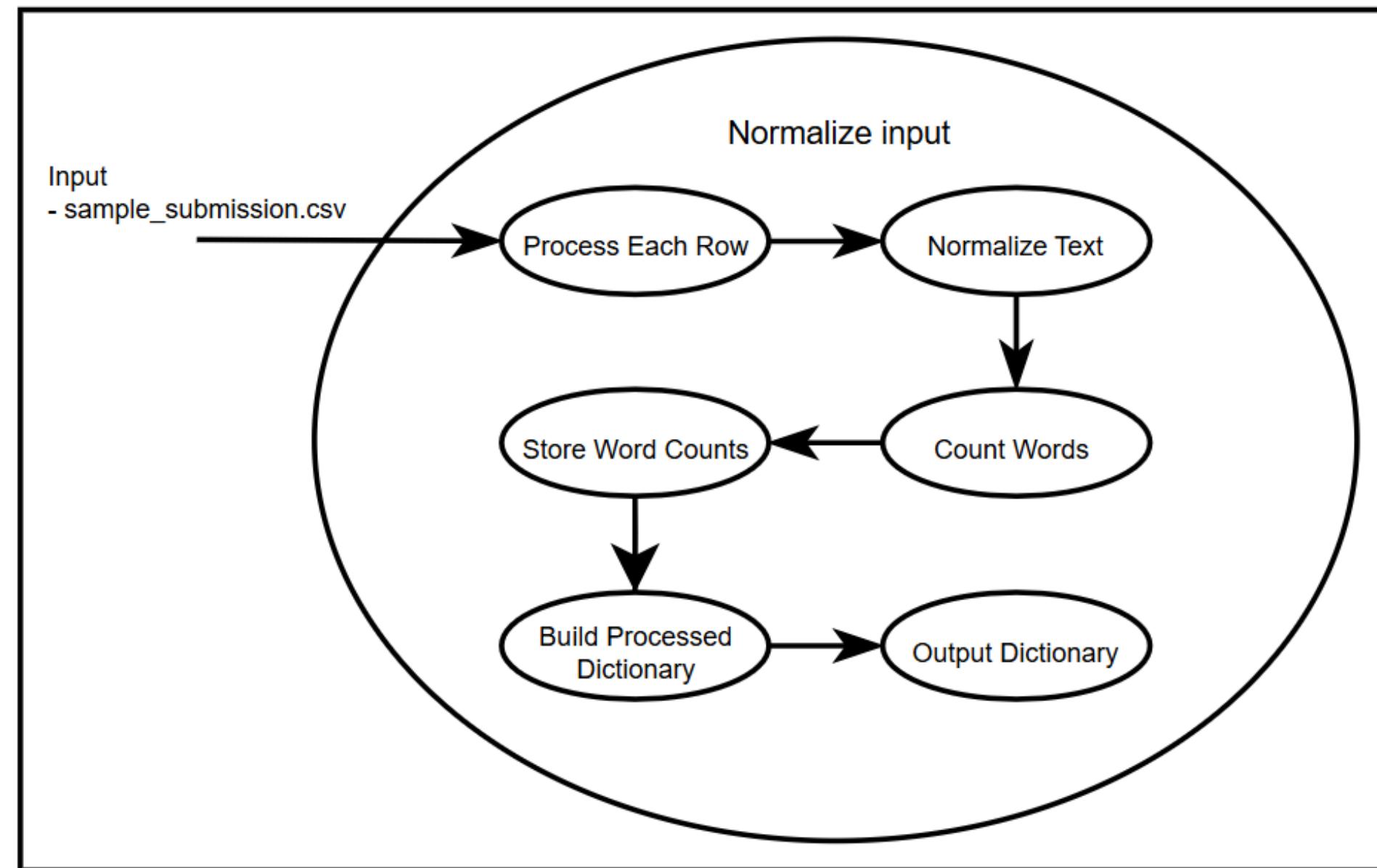
It essentially quantifies the uncertainty or "surprise" a model has when predicting the next item (such as a word) in a sequence



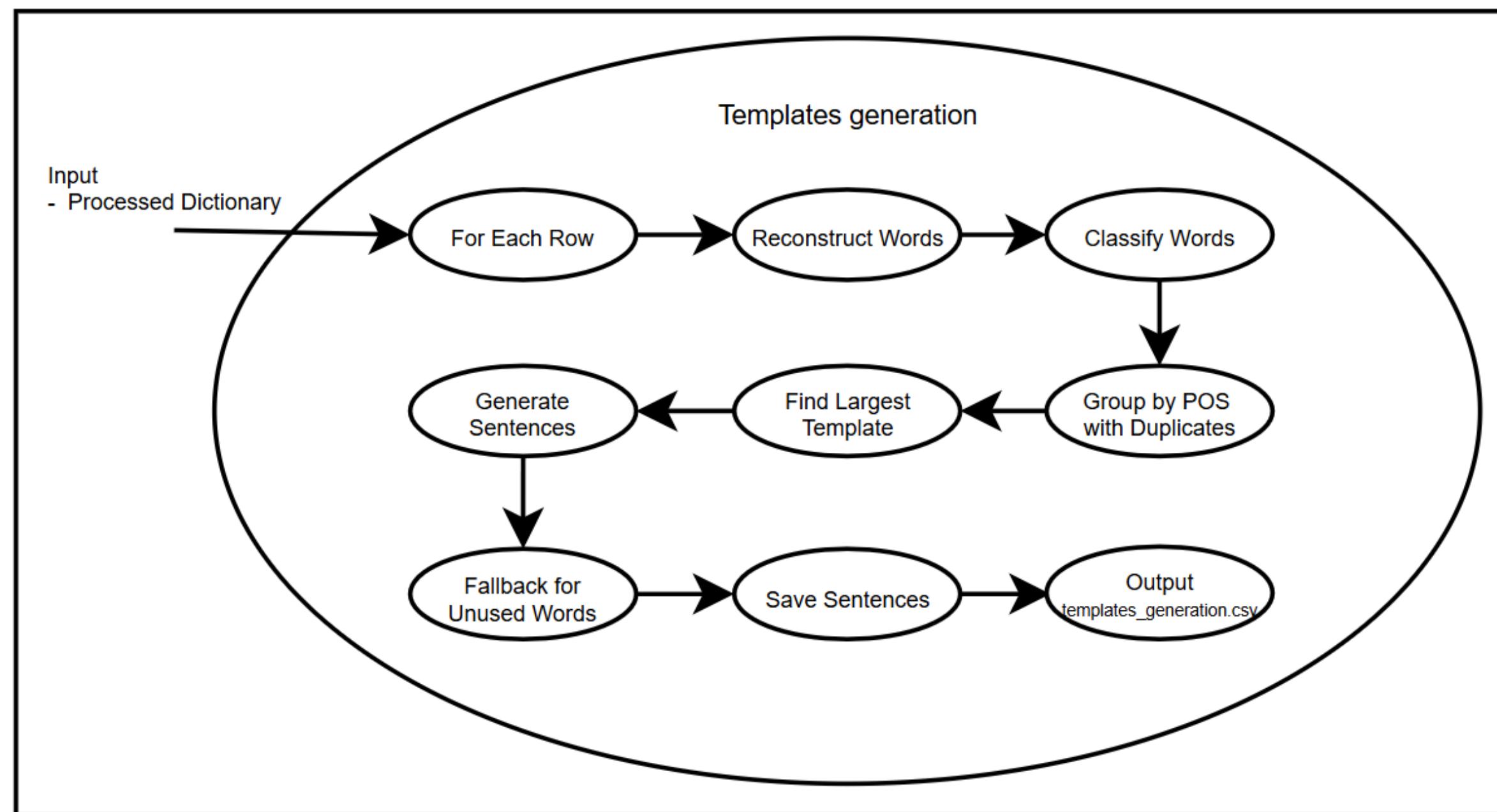
Systems Architecture



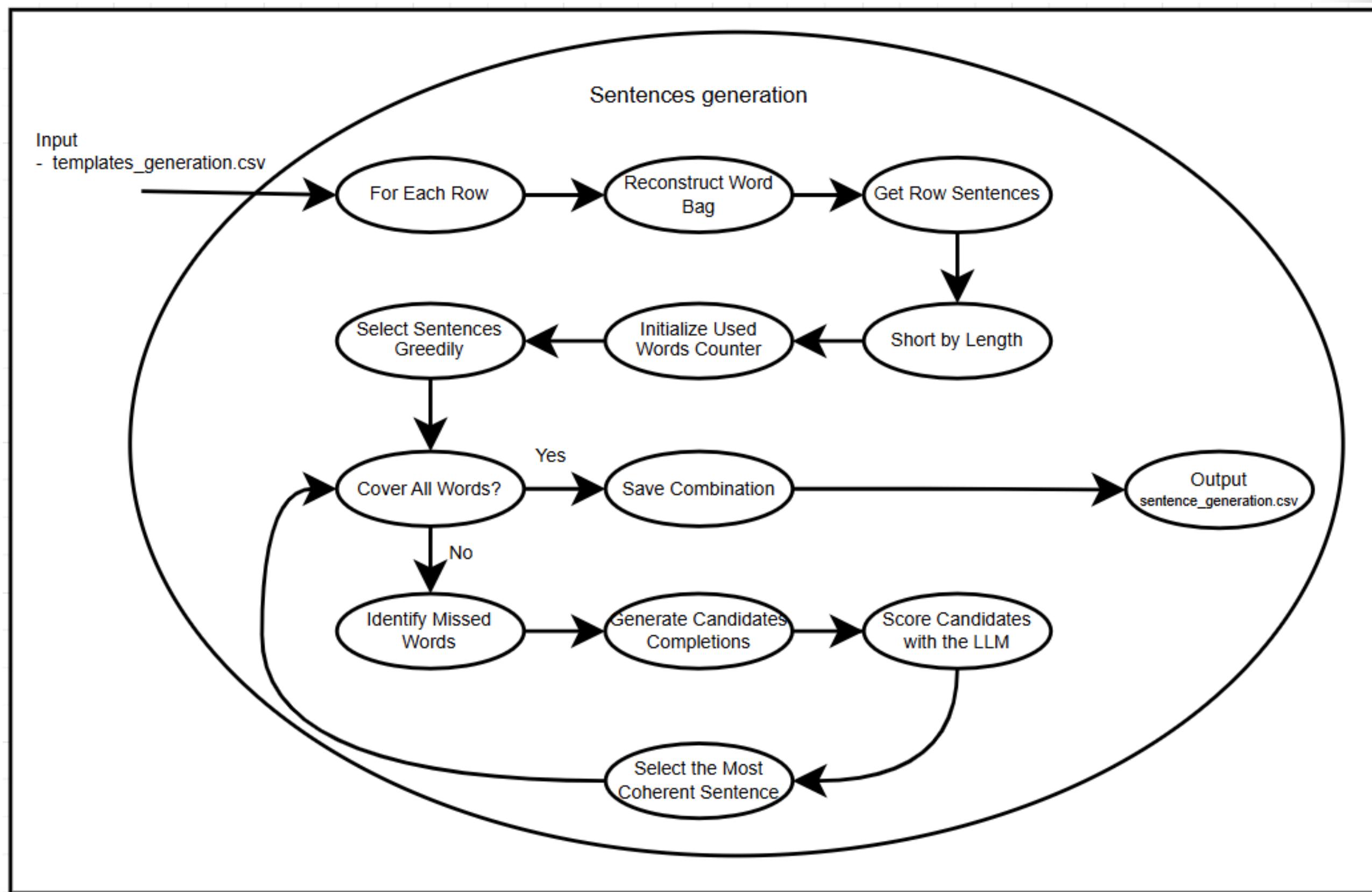
Normalize input



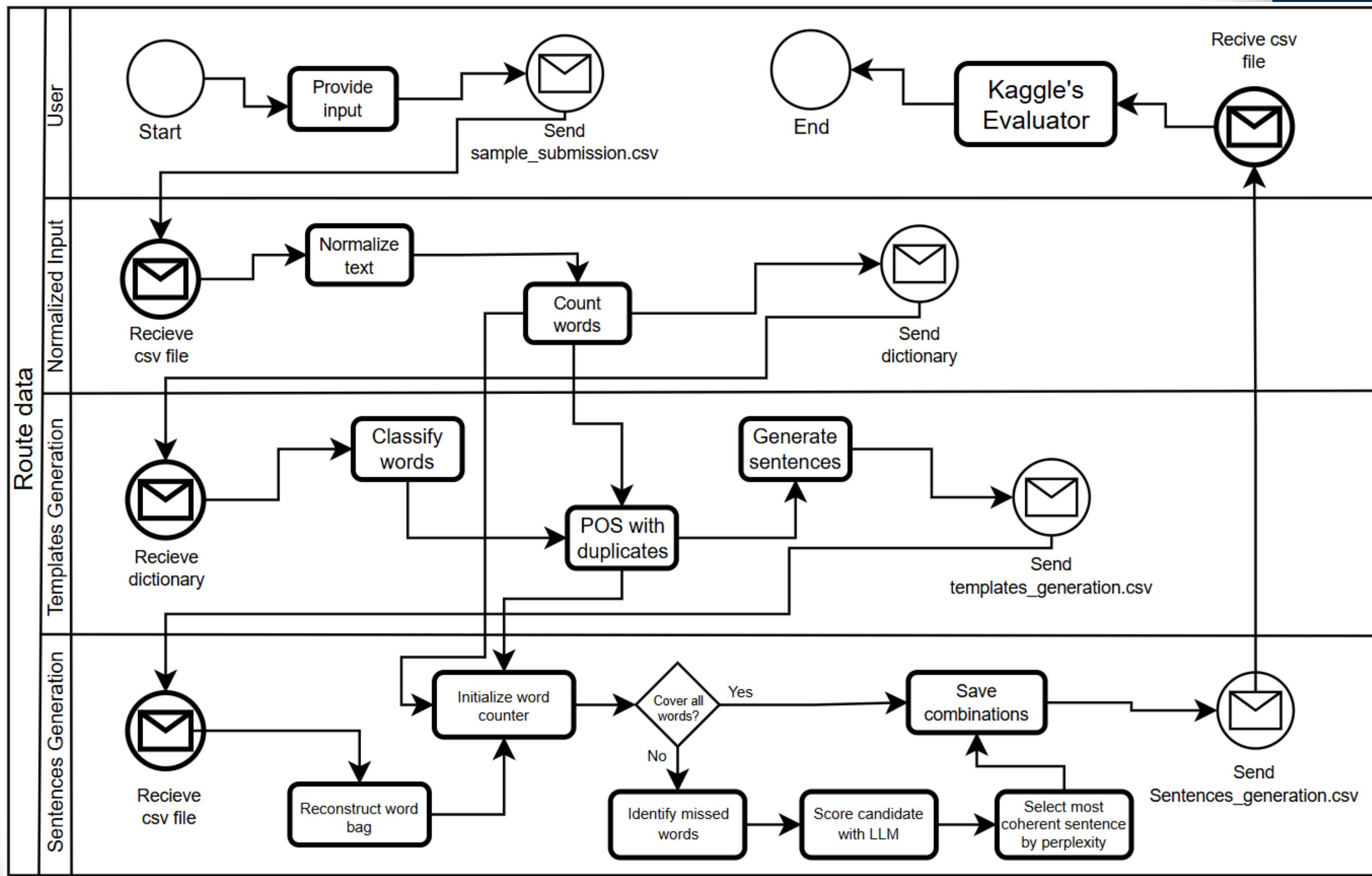
Templates generation



Sentence generation



BussinesProcessDiagram

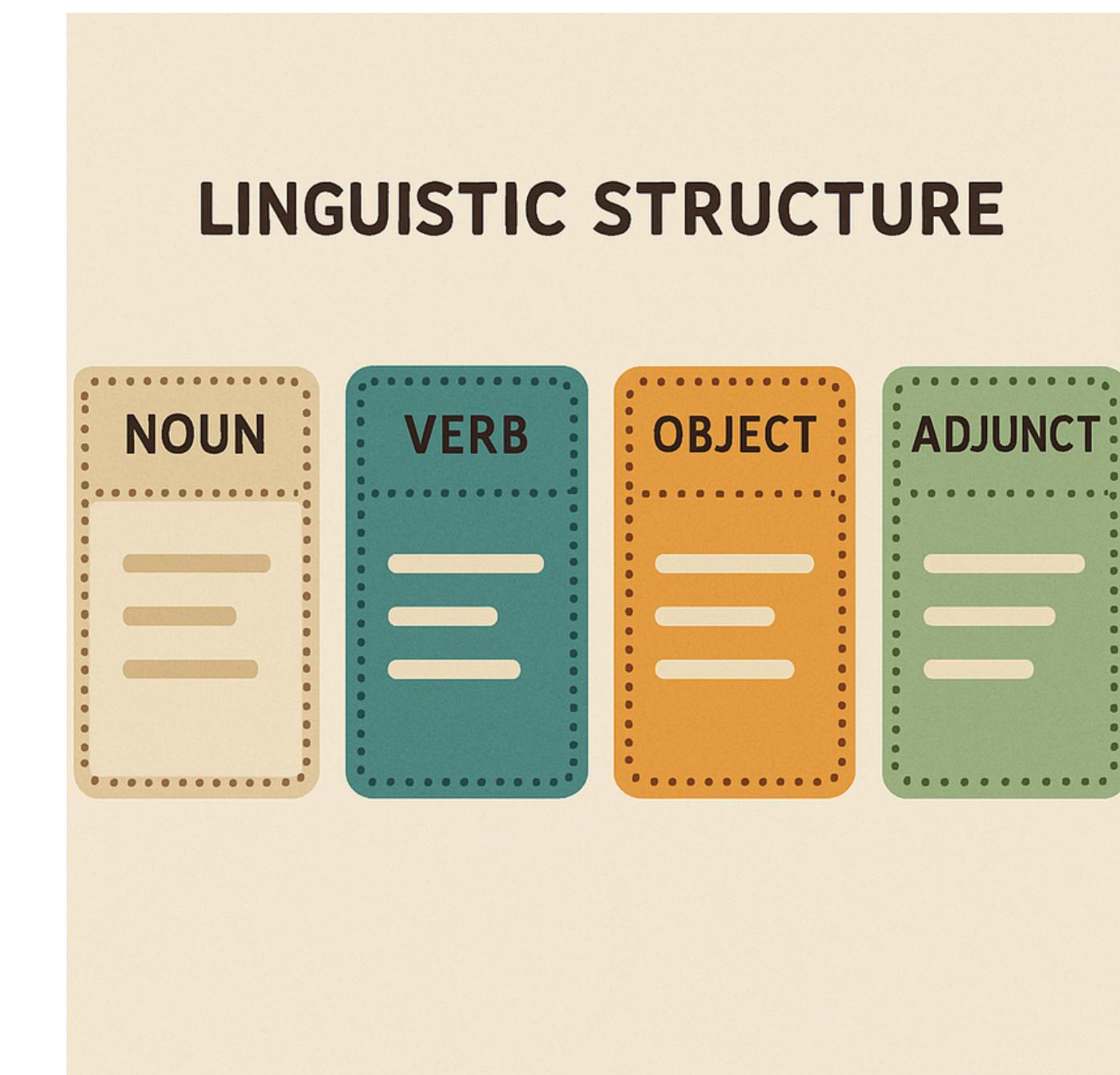


Sensitivity-Chaos attractors

Combinational
explosion

the cat sat on mat sat on mat cat mat
mat mat on mat sat sat sat on mat
hat sat he mat sat mat mat cat one sat on
mat on mat hat on mat rat mat mat mat
sat on mat mat rat mat hat mat sat cat
me sat ma cat sat on the cat sat he mat
the mat **the cat sat on the mat** the cat
sat on the nat mat
mat hat the mat the sat the cat on mat
mat mat on sat on nat mat sat on mat cat
sat on sat cat hat cat cat ont mat he sat
he cat sat on mat cat sat sat mat mat mat
cat on mat cat mat sat on hat cat the mat
mat cat cat sat mat mt mat mat oat dog

Templates limitation



Conclusions

- Simple system
- Linguistic analysis for simplify permutations
- Cybernetic approach

Thanks

GITHUB



<https://github.com/vydibot/Systems-Analysis>