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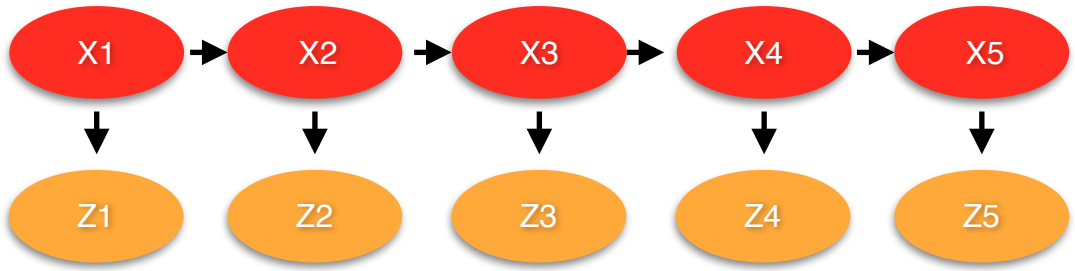
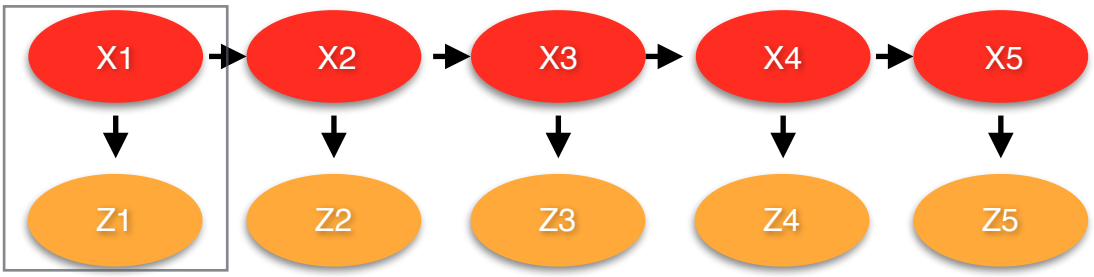
Machine Discovery hw1-1 report

- **Graphical model**

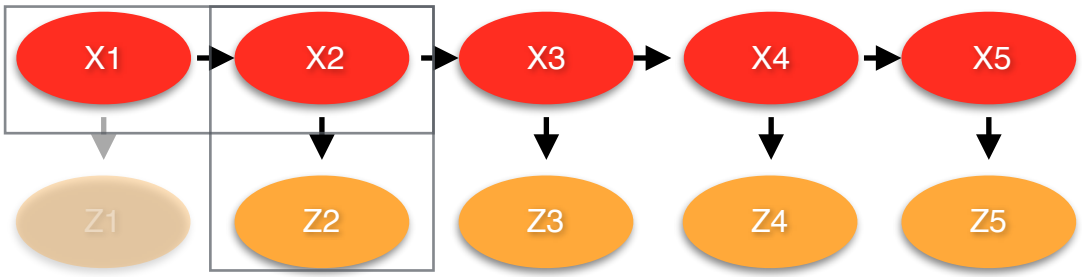


the probability of $\mathbf{P(X_i|X_{i+1})}$ is given from bigram.txt
the probability of $\mathbf{P(Z_i|X_i)}$ is given from encode.txt
since $\mathbf{P(Z_i|X_i) = P(X_i|Z_i)*P(Z_i) / P(X_i)}$, and regard $\mathbf{P(Z_i)}$, $\mathbf{P(X_i)}$ as same value for all $Z_i \in Z$, $X_i \in X$
so we use $\mathbf{P(Z_i|X_i)}$ to represent the value of given Z_i prob of $P(X_i)$

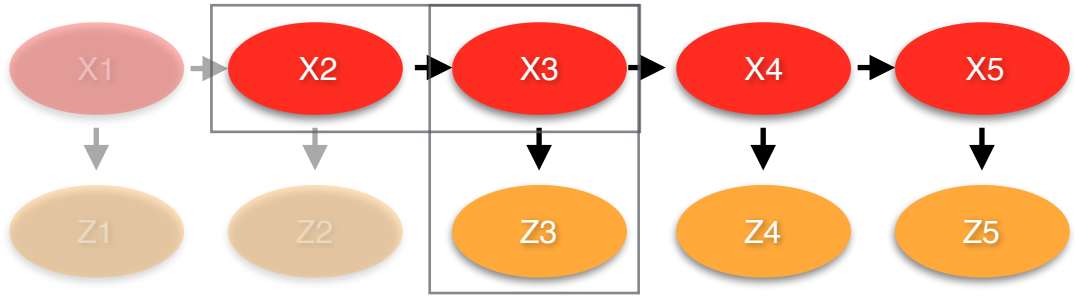
M(X1) = max P(X1 | ‘ ‘)P(X1 | Z1)



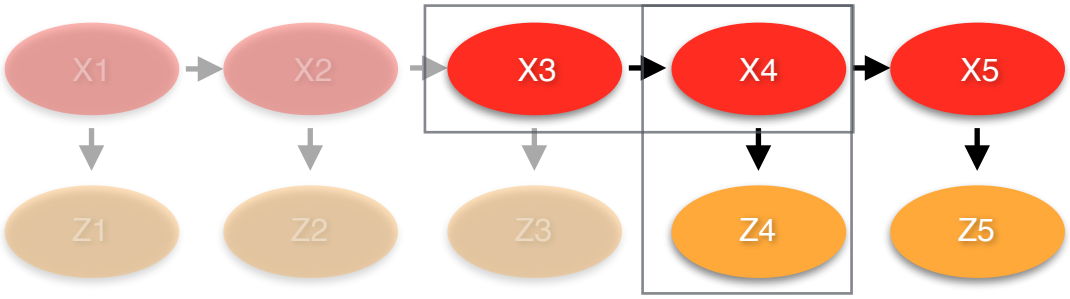
M(X2) = max P(X2 |X1)P(X2 | Z2)M(X1) store maximum path from X1 to X2



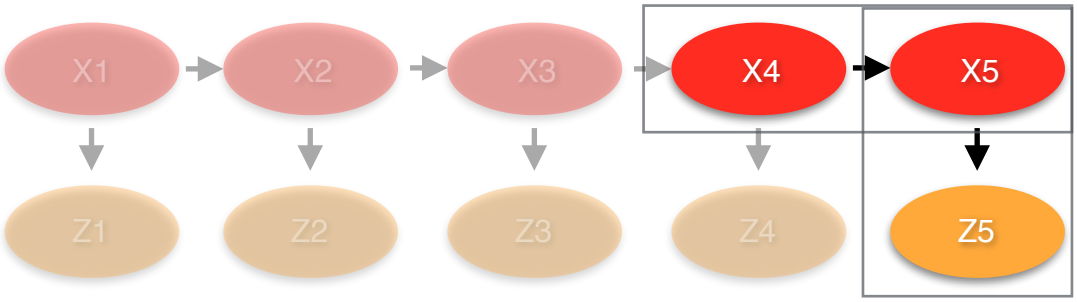
M(X3) = max P(X3 |X2)P(X3 | Z3)M(X2) store maximum path from X2 to X3



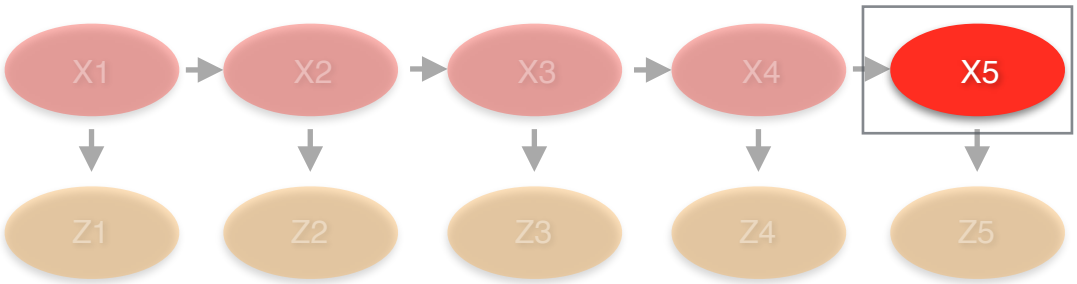
M(X4) = max P(X4 |X3)P(X4 | Z4)M(X3)　　store maximum path from X3 to X4



M(X5) = max P(X5 |X4)P(X5 | Z5)M(X4)　　store maximum path from X4 to X5



M(end) = max P(‘ ‘ |X5)M(X5)



Calculate the maximum probability path for each encoded words in test file. Since space can’t be encoded to other characters, we can split each word by space directly. Finally, output the final result to output file.

- **run the code**

-full argument:

python hw1-1.py --bigram_file [default=./bigram.txt] --encode_file [default=./encode.txt] --test_file [default=./test.txt] --output_file [default=./pred.txt]

-brief argument: (this will use default path directly)

python hw1-1.py

or

./run.sh