**Translation**

1. Ordinary sentence will end with full stop (.)
2. If there is a coma (,) in between sentences split the sentences into S1 and S2, S1 from beginning till coma and S2 after coma till full stop.
3. Apply POS Tagging for words in the sentences.
4. Apply chunking rules for the sentences.
5. Apply reordering rules for the sentences [Discourse reordering, Intra chunk reordering, Inter chunk reordering]
6. Apply Telugu word substitution.

**Step 3: POS tags used in the DB**

1. CC Coordinating conjunction

2. CD Cardinal number

3. DT Determiner

4. EX Existential *there*

5. FW Foreign word

6. IN Preposition or subordinating conjunction

7. JJ Adjective

8. JJR Adjective, comparative

9. JJS Adjective, superlative

10. LS List item marker

11. MD Modal

12. NN Noun, singular or mass

13. NNS Noun, plural

16. PDT Pre-determiner

17. POS Possessive ending

18. PRP Personal pronoun

19. PRP$ Possessive pronoun

20. RB Adverb

21. RBR Adverb, comparative

22. RBS Adverb, superlative

23. RP Particle

24. SYM Symbol

25. TO *to*

26. UH Interjection

27. VB Verb, base form

28. VBD Verb, past tense

29. VBG Verb, gerund or present participle

30. VBN Verb, past participle

31. VBP Verb, non-3rd person singular present (like)

32. VBZ Verb, 3rd person singular present (likes)

33. WDT Wh-determiner

34. WP Wh-pronoun

35. WP$ Possessive wh-pronoun

36. WRB Wh-adverb

14. NNP Proper noun, singular

15. NNPS Proper noun, plural

37. QT Quantifier

38. IDP Indefinite pronoun

39. SC Subordinate conjunction

40. OD Ordinal (Ex: first, second, third.)

**Step 4: Chunking:**

There are total Noun Phrase (NP), Verb Phrase (VP), Adverb Phrase (ADVP), Preposition Phrase(PP), Adjective Phrase (AdjP)

1. **Adverb Phrase (ADVP)**

| **LHS** | **RHS** | **Example** | **Chunking Output** | **Reordering** | **Telugu Outpu** |
| --- | --- | --- | --- | --- | --- |
| ADVP | RB | They surrendered peacefully | [NP They/PRP ] [VP surrendered/VBD ] [ADVP peacefully/RB ] |  | వారు శాంతముగా  longipoyaru |
|  | RB+RB | I go to the movies quite regularly | [NP I/PRP ] [VP go/VBP ] [PP to/TO ] [NP the/DT movies/NNS ] [ADVP quite/RB frequently/RB ] |  | Nenu cinemaki chala tarachuga veltuntanu |
|  | RBR+RB | She visits temple more frequently | [NP She/PRP ] [VP visits/VBZ temple/NN ] [ADVP more/RBR frequently/RB ] |  | Ame gudiki chala tarchuga veltundi |
|  | RBS+RB | Esmeralda acted most strangely | [NP Esmeralda/NNP ] [VP acted/VBD ] [ADVP most/RBS strangely/RB ]d d t |  | Esmeralda chala vichitramga natinchindi |

1. **Prepositional Phrase (PP)**

| **LHS** | **RHS** | **Example** | **Chunking Output** | **Reordering** |  |
| --- | --- | --- | --- | --- | --- |
| PP | IN | To the store | [PP to/TO ] [NP the/DT store/NN ] |  |  |
|  | RB+IN |  |  |  |  |

1. **Adjective Phrase (ADJP): In Telugu adjectives have the suffix -maina**

| **LHS** | **RHS** | **Example** | **Chunking Output** |  |  |
| --- | --- | --- | --- | --- | --- |
| ADJP | JJ | She is beautiful | [NP She/PRP ] [VP is/VBZ ] [ADJP beautiful/JJ ] |  | Ame andamuga vundi |
|  | RB+ JJ | He is very dark | [NP He/PRP ] [VP is/VBZ ] [ADJP very/RB dark/JJ ] |  | Vadu chala nallaga vunnadu |
|  | RBR+JJ | She is more beautiful | [NP She/PRP ] [VP is/VBZ ] [ADJP more/RBR beautiful/JJ ] |  | Ame chala andamuga vundi |
|  | RBS+JJ | She is most beautiful | [NP She/PRP ] [VP is/VBZ ] [ADJP most/RBS beautiful/JJ ] |  | Ame marintha andamuga vundi |
|  |  | She sings extremely good | [NP she/PRP ] [VP sings/VBZ ] [ADJP extremely/RB good/JJ ] |  | Ame chala manchiga padutundhi |

1. **Noun Phrase (NP)**

| **LHS** | **RHS** | **Example** | **Chunking Output** | **Reordering** | **Telugu Outputs** |
| --- | --- | --- | --- | --- | --- |
| NP | NN | Cat is a domestic animal | [NP cat/NN ] [VP is/VBZ ] [NP a/DT domestic/JJ animal/NN ] |  | Pilli oka pempudu jantuvu |
|  | NNS | Cats are playful | [NP cats/NNS ] [VP are/VBP playful/VBG ] |  | Pillulu atakari |
|  | NNP | Ram is a good boy | [NP Ram/NNP ] [VP is/VBZ ] [NP a/DT good/JJ boy/NN ] |  | Ramudu oka manchi baludu |
|  | PRP | They saw her | [NP They/PRP ] [VP saw/VBD ] [NP her/PRP] |  | Varu amenu chusaru |
|  | PRP$+JJ+NN  PRP$+NN+NN | My new house is good.  Your school bus is going.  Its Mine | [NP My/PRP$ new/JJ house/NN ] [VP is/VBZ ] [ADJP good/JJ ]  [NP your/PRP$ school/NN bus/NN ] [VP is/VBZ going/VBG ]  [NP Its/PRP$ Mine/PRP ] |  | Na kotha illu manchidhi  Mi skulu bassu veltunnadhi  Idhi nadhi |
|  | WP | Who wants coffee | [NP Who/WP ] [VP wants/VBZ ] [NP coffee/NN ] |  | Evariki coffee kavali |
|  | DT +NNS | The wombats escaped | [NP The/DT wombats/NNS ] [VP escaped/VBD ] |  | Wombats tappinchukunnavi |
|  | DT+NN | That vase is valuable | [NP That/DT vase/NN ] [VP is/VBZ ] [ADJP valuable/JJ ] |  | Aa vezu viluvainadhi |
|  | JJ+NN JJ+NNS | Strong winds | [NP Strong/JJ winds/NNS ] |  | Dattamaina mabbulu |
|  | PRP$+NN  PRP$+NNS | Her mind is powerful | [NP Her/PRP$ mind/NN ] [VP is/VBZ ] [ADJP powerful/JJ ] |  | Ame medhadu chala shaktivantahamainadhi |
|  | NNP+NNS | Metal plates shielded the instruments | [NP Metal/NNP plates/NNS ] [VP shielded/VBD ] [NP the/DT instruments/NNS ] |  | Panimutlani inapa pallalu rakshinchinavi |
|  | PDT+NNS | Some survivors remained | [NP Some/DT survivors/NNS ] [VP remained/VBD ] |  |  |
|  | WDT+NN | Which lobster do you want | [NP Which/WDT lobster/NN ] [VP do/VBP ] [NP you/PRP ] [VP want/VB]? |  | Aey lonsteru niku |
|  | CD+NNS | Seven boxes fell | [NP Seven/CD boxes/NNS ] [VP fell/VBD ] |  |  |
|  | OD+NNS | Second thoughts assailed us | [NP Second/JJ thoughts/NNS ] [VP assailed/VBD ] [NP us/PRP ] |  |  |
|  | QT+NNS | Several vats of beet | [NP Several/JJ vats/NNS ] [PP of/IN ] [NP beer/NN ] |  |  |
|  | DT+CD+NNS | The two culprits | [NP The/DT two/CD culprits/NNS ] |  |  |
|  | DT+NN+NNS | These metal plates | [NP These/DT metal/NN plates/NNS ] |  |  |
|  | JJ+JJ+NNS | Several other candidates | [NP Several/JJ other/JJ candidates/NNS ] |  |  |
|  | CD+JJ+NN | One such occasion | [NP One/CD such/JJ occasion/NN ] |  |  |
|  | DT+JJ | A second chance | [NP A/DT second/JJ chance/NN ] |  |  |
|  | NNP+JJ+NNS | Very old memories | [NP Very/NNP old/JJ memories/NNS ] |  |  |
|  | VP+NN | Carelessly organized meetings | [NP Carelessly/NNP ] [VP organized/VBD ] [NP meetings/NNS ] |  |  |
|  | DT+(JJ)\*+NN+NNS | The five good long old brown tables | [NP The/DT five/CD good/JJ long/RB old/JJ brown/NN tables/NNS ] |  |  |
|  | NNP +CC+NNP | Ram and Shyam | [NP Ram/NNP and/CC Shyam/NNP ] |  |  |
|  | NNS+CC+NNS | Cats and dogs | [NP Cats/NNS and/CC dogs/NNS ] |  |  |
|  | JJ+NNS +CC+NNS | old men and women | [NP old/JJ men/NNS and/CC women/NNS ] |  |  |
|  | PDT+DT+(JJ)\*+NNS | All the last few days | [NP all/PDT the/DT last/JJ few/JJ days/NNS ] |  |  |
|  | JJ/DT+NNS | Some people | [NP Some/DT people/NNS ] |  |  |

For none, not, no, neither add kAdu to the verb

1. **Verb Phrase (VP)**

| **LHS** | **RHS** | **Example** | **Chunking Output** | **Intra Chunk Reordering** |
| --- | --- | --- | --- | --- |
| VP | VBZ | He goes | [NP He/PRP ] [VP goes/VBZ ] |  |
|  | VBP | We see | [NP We/PRP ] [VP see/VBP ] |  |
|  | VBD | He left | [NP I/PRP ] [VP left/VBD ] |  |
|  | MD+VB | I will stay. | [NP I/PRP ] [VP will/MD stay/VB ] |  |
|  | VBD+VBN | We had gone. | [NP We/PRP ] [VP had/VBD gone/VBN ] |  |
|  | VBP+VBG | They are leaving. | [NP They/PRP ] [VP are/VBP leaving/VBG ] |  |
|  | VBZ+VBN | It is finished. | [NP It/PRP ] [VP is/VBZ finished/VBN ] |  |
|  | MD+VB+VBG | I could have danced. | [NP I/PRP ] [VP could/MD have/VB danced/VBN ] |  |
|  | MD+VB+VBN | She should be arriving. | [NP She/PRP ] [VP should/MD be/VB arriving/VBG ] |  |
|  | MD+VB+VBN | He must be stopped. | [NP He/PRP ] [VP must/MD be/VB stopped/VBN ] |  |
|  | VBZ+VBN+VBG | It has been raining. | [NP It/PRP ] [VP has/VBZ been/VBN raining/VBG ] |  |
|  | VBP+VBN+VBN | We have been encouraged. | [NP We/PRP ] [VP have/VBP been/VBN encouraged/VBN ] |  |
|  | VBZ+VBG+VBN | It is being discussed. | [NP It/PRP ] [VP is/VBZ being/VBG discussed/VBN ] |  |
|  | MD+VB+VBN+VBG | I could have been lying. | [NP I/PRP ] [VP could/MD have/VB been/VBN lying/VBG ] |  |
|  | MD+VBN+VBN+VBN | We may have been tricked. | [NP We/PRP ] [VP may/MD have/VB been/VBN tricked/VBN ] |  |
|  | MD+VB+VBG+VBN | It may be being discussed. | [NP It/PRP ] [VP may/MD be/VB being/VBG discussed/VBN ] |  |
|  | VBD+RB+VB | He did not arrive. | [NP he/PRP ] [VP did/VBD not/RB arrive/VB ] |  |
|  | VBP+RB+VBN | I have never played | [NP I/PRP ] [VP have/VBP never/RB played/VBN ] |  |
|  | VBZ+RB+VBN | Janet has not seen the Taj Mahal. | [NP Janet/NNP ] [VP has/VBZ not/RB seen/VBN ] [NP the/DT Taj/NNP Mahal/NNP ] |  |
|  | VBZ+RB+VBG | The president is not coming to town. | [NP The/DT president/NN ] [VP is/VBZ not/RB coming/VBG ] [PP to/TO ] [NP town/NN ] |  |
|  | VBD+RB+VBN | The mail was not sent to the wrong house. | [NP The/DT mail/NN ] [VP was/VBD not/RB sent/VBN ] [PP to/TO ] [NP the/DT wrong/JJ house/NN ] |  |
|  | MD+RB+VB | Jerome should not eat more meat. | [NP Jerome/NNP ] [VP should/MD not/RB eat/VB ] [NP more/JJR meat/NN ] |  |
|  | MD+TO+VB | You ought to do your homework. | [NP You/PRP ] [VP ought/MD to/TO do/VB ] [NP your/PRP$ homework/NN ] |  |
|  | MD+RB+TO+VB | You ought not to do your homework. | [NP You/PRP ] [VP ought/MD not/RB to/TO do/VB ] [NP your/PRP$ homework/NN ] |  |
|  | MD+RB+VB |  | [NP We/PRP ] [VP would/MD rather/RB go/VB ] [NP sailing/NN ] |  |
|  | MD+RB+RB+VB |  | [NP We/PRP ] [VP would/MD rather/RB not/RB go/VB ] [NP sailing/NN ] |  |
|  | **VBP+TO+VB** | I want to talk with you | [NP I/PRP ] [VP want/VBP to/TO talk/VB ] [PP with/IN ] [NP you/PRP ] |  |
|  | **VBZ+TO+VB** | Becky wishes to be younger | [NP Becky/NNP ] [VP wishes/VBZ to/TO be/VB ] [NP younger/JJR ] |  |
|  | **TO+VB** | I want to learn new things |  |  |
|  |  | She was reluctant to go home |  |  |
|  | **VBD+TO+VB** | she went to learn new things | [NP she/PRP ] [VP went/VBD to/TO learn/VB ] [NP new/JJ things/NNS ] |  |