# Chomsky Normal Form

1. Remove the ɛ productions from the following grammar:

S -> AbaC

A -> BC

B -> b/ ϵ

C -> b/ϵ

D -> d

1. Remove the Unit production:
   1. S → Aa/B

B → A/bb

A →a/bc/B

* 1. S → AB

A → a

B→C/b

C→D

D→E

E→a

1. Eliminate the useless symbols:
   1. S → AB/a

A → BC/b

B → aB/C

C→ aC/B

* 1. S -> AB/ AC

A -> aAb/bAa/a

B ->bbA/aaB/AB

C -> abCA/aDb

D ->bD/aC

* 1. S ->ABC/BaB

A -> aA/BaC/aaa

B -> bBb/a

C -> CA/AC

1. Convert the following CFGs into CNF:
2. S → ASB

A → aAS | a | ɛ

B → SbS | A | bb

1. S → a | aA | B

A → aBB | ɛ

B → Aa | b

1. S → ABA | BaA | A

A → Ba | S | ɛ

B → Ba | b | Ca

C→ Ca

D →DaD | a