CISP 440

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Homework 15

1. Context-Sensitive
2. Context-Sensitive
3. *abab* 🡪 aBAb 🡪 aABb 🡪 AB 🡪 **σ**
4. *abaabbabba* 🡪abaabbabbS 🡪 abaabbabS 🡪 abaabbaS 🡪 abaabbA 🡪 abaabB 🡪

abaaA 🡪 abaS 🡪 abB 🡪 aA 🡪 **S**

1. Converting Exercises 1-4 into BNF
   1. <σ> ::= b<σ> | a<σ> | b

<A> ::= a<σ> | b<A> | a

* 1. <σ> ::= <A><B>

<A> ::=a<A> | a

<B> ::= <B>b | b

<A><B> ::= <B><A>

* 1. <σ> ::= <A> | <A><B><A>

<A> ::= <A><B>

<B> ::= b

<A>a ::= <A><B>a

<B>b ::= <A><B>b

<A><B> ::= <A><B><B>

* 1. <σ> ::= <B><A><B> | <A><B><A>

<A> ::= <A><B> | a<A> | ab

<B> ::= <B><A> | b

1. T = {a, b}, N = {σ, A}, with productions

<σ> ::= a<A> | a<σ> | b<σ>

<A> ::= a<A> | b<σ> | b

And starting symbol σ

1. T = {a, b}, N = {σ, A}, with productions

<σ> ::= b<A> | b<σ>

<A> ::= a<A> | a<σ> | a

And starting with symbol σ

1. <digit> ::= 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

<integer> ::= <signed integer> | <unsigned integer>

<signed integer> ::= + <unsigned integer> | - <unsigned integer>

<unsigned integer> ::= <digit> | <digit><unsigned integer> | <digit><null>

<null> ::= 0<null> | 0<unsigned integer>

1. <digit> ::= 0 | 1 |2 | 3 | 4 | 5 | 6 | 7 | 8 | 9

<signed number> ::= + <unsigned number> | - <unsigned number>

<unsigned number> ::= <digit> | <digit><unsigned number> | <digit><punct>

<punct> ::= E<signed number> | .<unsigned number>

1. S 🡪 aSb 🡪 aλ

There is one a and 0 b’s, which means there are not an equal number of a’s and b’s, which means that this statement does not guaranteed generate an equal number of a’s and b’s