

•Grading: 3 = correct
2 = almost
1 = an attempt
0 = nothing

•Score: Points / Possible

Homework #1

Trevor Dixon

Name

Sec

Discussion 3

Questions:	Answers:
<p>1. If V denotes the set of symbols $\{a, b, c, 0, 1\}$, then</p> <p>a) $V^0 =$</p> <p>b) $V^2 =$</p> <p>c) $V^3 =$</p>	<p>a) $\{\}$</p> <p>b) $\{aa, ab, ac, a0, a1, ba, bb, bc, b0, b1, ca, cb, cc, c0, c1, 0a, 0b, 0c, 00, 01, 1a, 1b, 1c, 10, 11\}$</p> <p>c) 125</p>
<p>2. Give the language (each possible string) described by the following grammar. S is the start symbol. (Recall that a language is a subset of V^*, where V is the alphabet.)</p> <p>$S \rightarrow a \mid aTb \mid aTbTc$</p> <p>$T \rightarrow x \mid xy \mid xyz$</p>	<p>$\{a, axb, axyb, axyzb, axbxc, axybxc, axyzbxc, axbxyz, axybxyz, axyzbxyz, axbxyzc, axybxyzc, axyzbxyzc\}$</p>
<p>3. Describe the language (in words) generated by each of the following grammars?</p> <p>a) $S \rightarrow 0 S 1 \mid \epsilon$</p> <p>b) $S \rightarrow S S \mid 1 \mid 0$</p>	<p>a) Zero or more 0s followed by the same number of 1s.</p> <p>b) A 1 or 0 followed by any number of 1s and 0s.</p>
<p>4. Given the following grammar, generate four grammatically correct sentences. The start symbol is Sentence.</p> <p>Sentence \rightarrow SubjectPart VerbPart</p> <p>SubjectPart \rightarrow Article Noun</p> <p>Article $\rightarrow a \mid the \mid an$</p> <p>Noun $\rightarrow monkey \mid banana \mid tree \mid gorilla$</p> <p>VerbPart \rightarrow Verb Object</p> <p>Verb $\rightarrow ate \mid climbed \mid licked \mid laughed$</p> <p>Object \rightarrow NounPart</p> <p>NounPart \rightarrow Article Noun</p>	<p>the monkey ate a banana</p> <p>a tree climbed the tree</p> <p>an gorilla ate the tree</p> <p>the banana licked a gorilla</p>