



南方科技大学
SOUTHERN UNIVERSITY OF SCIENCE AND TECHNOLOGY

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for SUSTech CSE

PROJECT 1

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1 Consider the following context-free grammar G

$$S \rightarrow SS + | SS * | a$$

1.1 Is the string $a+a*a$ in $L(G)$? [20 points]:

No, it isn't in $L(G)$. For this grammar, the first two character of the string must be aa or the string just have a single character a .

1.2 Give a leftmost derivation for the string $aa*aa+*$. [20 points]:

$$S \rightarrow SS* \rightarrow SS*S* \rightarrow aS*S* \rightarrow aa*S* \rightarrow aa*SS+* \rightarrow aa*aS+* \rightarrow aa*aa+*$$

1.3 Give a rightmost derivation for the string $aa*aa+*$. [20 points]:

$$S \rightarrow SS* \rightarrow SSS+* \rightarrow SSa+* \rightarrow Saa+* \rightarrow SS*aa+* \rightarrow Sa*aa+* \rightarrow aa*aa+*$$

1.4 Give a parse tree for the string $aa*aa+*$. [20 points]: