

Homework #8 due last recitation before final exam (time to be announced)

Question 1

Describe a TM M in both graphical and compositional tabular forms that performs the following computation :

$$(s, \$w\#) \vdash^{*M} (h, \$u\#)$$

where u is obtained from w by compressing (deleting) all blank ($\#$) symbols in w and $\$$ is a special symbol not used in w .

Question 2

Construct a TM M (*multitape and/or nondeterministic if necessary!*) that decides the language L^* using a TM M_I that decides the language L .

Question 3

Construct TMs in compositional tabular forms (*multitape and/or nondeterministic if necessary!*) that perform the following computations :

$$(i) (s, \#w) \vdash^{*M} (h, \#w^R)$$

$$(ii) (s, \#w) \vdash^{*M} (h, \#ww)$$

$$(iii) (s, \#w) \vdash^{*M} (h, \#w\#w^R)$$

$$(iv) (s, \#w) \vdash^{*M} (h, \#a^n b^n) \text{ where the number of } a\text{'s and } b\text{'s in } w \text{ are both equal to a fixed integer } n > 0.$$