



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF ENGINEERING

SCHOOL OF COMPUTING

SESSION 2020/2021 SEMESTER 2

SCSJ3203 THEORY OF COMPUTER SCIENCE
SECTION 04

TUTORIAL 11
TURING MACHINE PART 2

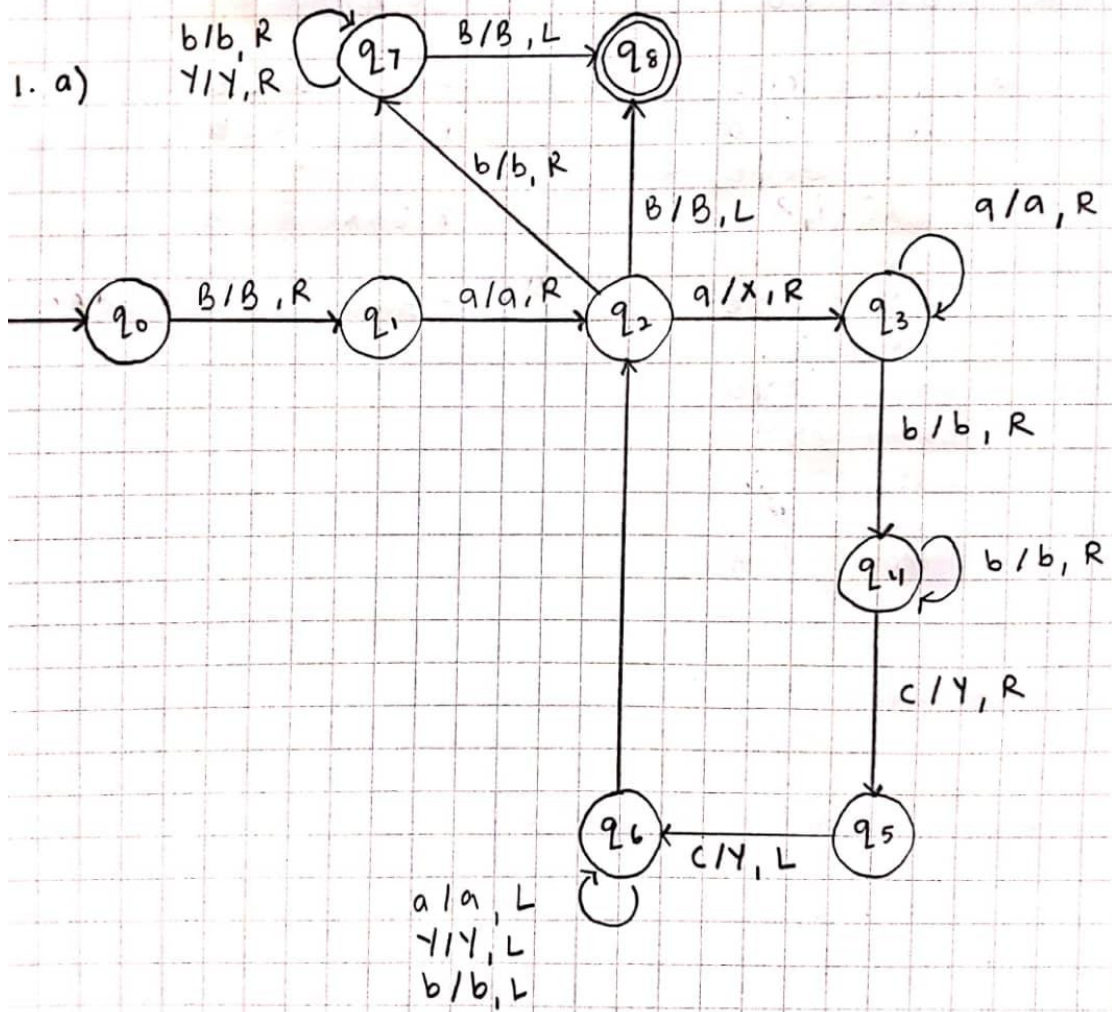
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Matrics : B19EC0006

Lecturer : DR ZALMIYAH ZAKARIA

Due Date : 5th July 2021

TCS Tutorial 11: Turing Machine Part 2.



1. b) $q_0 B a a b c c B$

$\vdash B q_1 a a b c c B$
 $\vdash B a q_2 a b c c B$
 $\vdash B a X q_3 b c c B$
 $\vdash B a X b q_4 c c B$
 $\vdash B a X b Y q_5 c B$
 $\vdash B a X b q_6 Y Y B$
 $\vdash B a X q_6 b Y Y B$
 $\vdash B a q_6 X b Y Y B$
 $\vdash B a X q_7 b Y Y B$
 $\vdash B a X b q_7 Y Y B$
 $\vdash B a X b Y q_7 Y B$
 $\vdash B a X b Y Y q_7 B$
 $\vdash B a X b b Y q_8 Y B$

- Halts at q_8 ,
accepted.

1. c) $\{ a^{n+1} b^* c^{2n} \mid n \geq 0 \}$

1. d) $a a a b c c c$
 $a a b b c c$

$q_0 B a b b c B$

$\vdash B q_1 a b b c B$
 $\vdash B a q_2 b b c B$
 $\vdash B a b q_1 b c B$
 $\vdash B a X b q_7 c B$

- Halt, not accepted.

2. a) $q_0 B a a b c c B$

$\vdash B q_1 a a b c c B$
 $\vdash B a q_2 a b c c B$
 $\vdash B a x q_3 b c c B$
 $\vdash B a x Y q_4 c c B$
 $\vdash B a x Y Z q_5 c B$
 $\vdash B a x Y q_6 Z Z B$
 $\vdash B a x q_6 Y Z Z B$
 $\vdash B a q_6 x Y Z Z B$
 $\vdash B a x q_2 Y Y Z Z B$
 $\vdash B a x Y q_7 Y Z Z B$
 $\vdash B a x Y Y q_7 Z Z B$
 $\vdash B a x Y Y Z q_1 Z B$
 $\vdash B a x Y Y Z Z q_7 B$
 $\vdash B a x Y Y Z Z B q_8 B$

- Halts at q_8 ,
accepted.

2. b) $a a a b b c c c$
 $a a a a b b b c c c c$

2. c) $\{ a^{m+1} b^m c^{2n} \mid m=n \}$

3.

B	A
C	D