

Regular Expression Practice Sheet

① Even number of a

$$b^* + (b^* ab^* ab^*)^*$$

② b appear exactly three times

$$a^* bbb a^*$$

③ String over {a, 1} that start and end with the same char.

$$0(0+1)^* 0$$

④ ab as a substring.

$$(a+b)^* ab(a+b)^*$$

⑤ Binary strings divisible by 4
(end with 00)

$$1^+ 00$$

⑥ Strings over {a, b, c} that do not contain abc as a Substring

$$b^* a^* c^*$$

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- ⑦ Strings over $\{a, b\}$ where a appears twice as many times as b.

$$(aab)^* + (baa)^*$$

- ⑧ Strings over $\{x, y, z\}$ where y appears at most twice.

$$x^*(yy)^*z^*$$

- ⑨ exactly 3 over $\{0, 1\}$
 $\{000, 001, 010, 011, 100, 101, 110, 111\}$

- ⑩ every b is immediately followed by a.

$$b^*(ab)^*b^*$$

- ⑪ Contain no consecutive 1s.

$$(0+10)^*$$

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⑫ do not contain bb.

$$(a+ba)^*$$

⑬ start and end with b.

$$b(a+b)^*b$$

⑭ 0s and 1s appear equally

$$(01+10)^*$$

⑮ strings over $\{a,b,c\}$ that end with ac.

$$(a^*b^*c^*)^*ac$$

⑯ exactly one occurrence of bs

$$(a+b)^*b(a+b)^*$$

⑰ b only appears in even positions

$$(ab)^*a^*$$

⑲ a appears atleast once

$$(a+b)^*a(a+b)^*$$

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(21) Contain exactly one 1.

$$0^* 1 0^*$$

(22) Where b appears at the third Position only

$$(aab)^* a^*$$

(23) Strings over $\{a, b, c\}$ that Start with ab-

$$ab(a^* b^* c^*)$$

(24) do not contain aa.

$$b^*(ab)^* a^*$$

(25) only contain alternating 0s and 1s

$$(01)^* 0 + (10)^* 1.$$

(26) y only appears in the last three Positions

$$x^* (x+ty)$$

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- 27) Contain both ab and ba as substrings

$(a+b)^*ab(a+b)^*ba(a+b)^*$

- 28) Strings over {a,b,c} where c appears at least once and never before b.

$(a+b)^*c$

- 29) where a appears an odd number of times.

$b^*(ab^*ab^*)^*ab^*$

- 30) Contain atleast one b.

$(a+b)^*b(a+b)^*$

- 31) Contain ba as a substring

$(a+b)^*ba(a+b)^*$

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31 Strings over $\{a, b, c\}$ where b appears at most once

$$(a+c)^* (b(a+c)^*)$$

32 That contain at least one

aa

$$(a+b)^* aa (a+b)^*$$

33 where 0 appears an odd number of times.

$$1^* (01^* 01^*)^* 01^*$$

34 Start with a and end with b.

$$a(a+b)^* b.$$

35 Strings end with 01.

$$(0+1)^* 01.$$

36 Binary strings divisible by 2.
(end with 0) $1^* 0$

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38 where b appears only before a

$$a^* (ba)^* a^*$$

39 Strings over $\{a, b, c\}$, where c appears at least once

$$a^* b^* c^*$$

40 Contain at most two bs

$$a^* b a^* \{0,2\}$$

41 where b appears exactly twice.

$$a^* bb a^*$$

42 Start with ab and end with ba.

$$ab(a+b)^* ba.$$

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43. where every a is followed by bb .

$$b^* (bb^*)^* b^*$$

44. where the number of $1s$ is odd

$$0^* (10^* 10^*)^* 10^*$$

45. that end in at least two as .

$$(a+b)^* a^2$$

46. Contain 110 as a Substring

$$(0+1)^* 110 (0+1)^*$$

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- 48 String over $\{a, b\}$ that contain
an even number of bs and
atmost three as.

$$a^*(ab^*a)^*$$

- 49 That begin and end with
different characters:

$$\{0(0+1)^*1 + 1(0+1)^*0\}$$

50. where a is followed by at
most one b.

$$(bta)^*b^*$$