

## Homework Module #5

8. Find a regular expression for the set  $\{a^n b^m : (n+m) \text{ is odd}\}$ .

•  $n$  is odd  $m$  is even or vice versa

$$r = (aa)^* b (bb)^* + a (aa)^* (bb)^*$$

9. Give regular expressions for the following languages

b)  $L_2 = \{a^n b^m : n < 4, m \leq 4\}$

$$r = (\lambda + a + a + a)(\lambda + b + b + b + b)$$

c) The complement of  $L$ ,

$$\bar{L} = \{a^n b^m : n < 3, m > 4\}$$

$$r = (\lambda + a + a)(bbbb)b^*$$

17. Find a regular expression for

$$L = \{vwv : v, w \in \{a, b\}^*, |v| \leq 4\}$$

$$r = (a+b)(a+b)(a+b)(a+b)[a+b]^*(a+b)(a+b)(a+b)(a+b)$$

$$\text{or } r = \lambda [a+b]^* \lambda \quad \text{where } v = \lambda \text{ and } w = (a+b)^*$$