

Quiz #4

Name: \_\_\_\_\_ Honor Code: \_\_\_\_\_

Proofs using closure. You may assume that the language  $\{ a^n b^n, n > 0 \}$  is non regular.

1. You have been given the language:  $\{ a^i b^j c^k, i, j, k > 0 \text{ or when } k == 0, i == j \}$ .  
Use closure properties and the assumptions listed on this test (no pumping lemma proofs) to show that this language is not regular.

2. What is the error in the following proof:  
Assume that a language A (you do not know the details of this language or any strings that belong in it) is a regular language. The intersection between A and  $0^*1^*$  is known to be a language with no strings (the empty set  $\emptyset$ ). Since  $\emptyset$  is also a regular language, our original assumption must have been true and A is definitely a regular language.