

CSI 350 — Theory of Computation, Fall 2005

Handout #5 - Wednesday, November 9, 2005

1. HW #4 (four problems) due Monday (11/14) at the start of class.
2. **Homework (#4)**
 - (a) Problem 1: Turing, Hilbert and Church
 - i. Briefly explain the contributions of Turing, Hilbert and Church. Use one sentence for each.
 - ii. What is the Church-Turing thesis?
 - iii. What problem did the Church-Turing thesis solve?
 - (b) Problem 2: Decidability
 - i. Why is decidability important?
 - ii. If I can prove a language is decidable, what does that mean?
 - iii. What is the halting problem?
 - (c) Problem 3: Give the tightest language classification (regular, context free, turing decidable, turing recognizable) on the following languages given that $\Sigma = \{0, 1\}$:
 - i. $\{0^n 1^n 0^n \mid n \geq 1\}$
 - ii. $\{(0 \cup 1)^* 100\}$
 - iii. $\{0^n 1^n \mid n \geq 1\}$
 - iv. $\{0^n 1^n 1^{2n} \mid n \geq 1\}$
 - v. $\{(0 \cup 1)^n (0 \cup 1)^n (0 \cup 1)^n \mid n \geq 1\}$
 - (d) Problem 4: Give the language classification of the following:
 - i. Given that language A is decidable, what is the classification of \overline{A} .
 - ii. Given that language A is recognizable, what is the classification of \overline{A} .