

## Advanced Theory

Survival Analysis 2005

Problem for February 15, 2005

$t_1, t_2, \dots, t_m$  are survival times and  $S(t) = \exp(-\lambda t)$ .

Show:

1)  $f(t) = \lambda \exp(-\lambda t)$

2) The maximum likelihood estimate of  $\lambda$  is

$$\hat{\lambda} = \sum_{i=1}^d t_i / d$$

where  $d$  = number of complete observations.

3) Variance of  $\hat{\lambda}$  is estimated by,

$$\text{variance}(\hat{\lambda}) = \hat{\lambda}^2 / d$$