

## Homework 8: Due 04/10/2018

1. (5 points) Problem 11 on page 384 of Shao (2003).  
Derive the form of nonparametric MLE (MELE in the book) with information  $\int u(x)dF = 0$ .  
Remark: Although the solution is not explicit, the solution is a  $\sqrt{n}$ -consistent estimator of  $F$  and is asymptotically normal, as shown in Theorem 5.4. Comparing with the empirical cdf, the nonparametric MLE is more efficient.
2. (15 points) Problem 15 on page 384 of Shao (2003). Derive the nonparametric MLE, Kaplan-Meier estimator, for the censored data.
3. (15 points) Problem 20 & 21 on page 385 of Shao (2003).  
Relationship between maximum profile likelihood estimator and MLE.
4. (15 points) Problem 23 on page 385 of Shao (2003).  
Profile likelihood with missing data.