2nd exercises for SIM'2018

Ex. 1
Let U have uniform distribution between $(-1, 1)$, so $\mathrm{f}_U(u) = 1/2$. What is the distribution of transformed variable $V = U^2$?

Ex. 2
Download the datafile `two-variable.dat` and make report (including, e.g., statistics of the two variables (columns), dependence, plots...)

Ex. 3
a) Derive log-likelihood function for model where $Y_1, \ldots, Y_n$ are i.i.d and follow Poisson distribution $\mathcal{P}(\lambda)$.
b) Make figure of $\mathrm{l}(\lambda)$ in cases where (i) $n = 10$ and $\overline{y} = e$, (ii) $n = 10$ and $\overline{y} = 25$.

Ex. 4
a) Formulate maximum likelihood equations for n i.i.d observations from Poisson distribution.
b) Derive maximum likelihood estimate for parameter λ in ML equations in case a)

Ex. 5
a) Show that mean $\overline{y}$ is the MLE for μ when Y_i are i.i.d and follow $\mathcal{N}(\mu, 1)$.
b) Make figure of $\mathrm{l}(\mu)$ when $\overline{y} = 3$ and (i) $n = 20$, (ii) $n = 40$.