1147-03-167 **Kenshi Miyabe*** (`research@kenshi.miyabe.name`), Area 2, Bldg-No.6, 6705, 1-1-1 Higashimita, Tama-ku, Kawasaki, Kanagawa 214-8571, Japan. *Muchnik degrees and Medvedev degrees of the randomness notions.*

We study some randomness notions in Muchnik and Medvedev degrees. Let $P, Q \subseteq 2^\omega$. We say that P is Muchnik reducible to Q ($P \leq_w Q$), if, for every $f \in Q$, there is an element $g \leq_T f$ in P. We say that P is Medvedev reducible to Q ($P \leq_s Q$), if there is a Turing functional Φ such that $\Phi^f \in P$ for every $f \in Q$. The randomness notions are ML-randomness, difference randomness, Demuth randomness, weakly 2-randomness, 2-randomness, computable randomness, Schnorr randomness, and Kurtz randomness. Each class is denoted by MLR, DR, DemR, WTR, TR, CR, SR, and WR, respectively.

We have the following result:

$$\mathrm{WR} <_w \mathrm{SR} \equiv_w \mathrm{CR} <_w \mathrm{MLR} \equiv_w \mathrm{DR} \begin{matrix} <_w & \mathrm{WTR} & <_w \\ <_w & \mathrm{DemR} & <_w \end{matrix} \mathrm{TR}.$$

In particular, for every $A \oplus B \in \mathrm{MLR}$, at least one of A and B should be difference random. However, we do not know which is. In fact, we can not do this uniformly:

$$\mathrm{MLR} <_s \mathrm{DR},\ \mathrm{SR} <_s \mathrm{CR}.$$

Our proof of the second strictness extends the method to separate SR and CR. (Received January 06, 2019)