Risk analysis lab 2019. 10. 08. (Calculating risk)

1. Let h_i denote the amount of deposit belongs to each client $i = 1,\ldots,M$ with $p_i = P\left(X_i = h_i\right)$ and $X_i \in \left\{0; h_i\right\}$ probability of withdrawal. In a new script generate these vectors randomly as $h_i \sim N\left(\mu = 1600, \sigma = 200\right)$ and $p_i \sim U\left(0,1\right)$. $M = 17$

   (1 point)

2. Let $y_i \in \left\{0;1\right\}$ stands for the event when the *i*-th customer withdraws their deposit, while $\psi \in \left\{0,1\right\}$ denotes the event that the bank exceeds its cash C. Calculate $E\left(\psi\right) = P\left(\sum_{i=1}^{M} y_i h_i > C\right)$ analytically (Sum $\psi \prod_{i=1}^{M} p_i^{y_i} \left(1 - p_i\right)^{1-y_i}$ over all possible $\mathbf{y}$ vectors).

   a. First, create an array of all possible ***y*** vectors. The simplest solution is to make a binary counter, and store its results. You should create a function for this.

   (2 points)

   b. Then make the summation.

   (2 points)

   c. Test it for $C = \left\{10000, 11000, 12000, 13000, 14000, 15000\right\}$.

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P = analytical(h, p, C)
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