Ex 1: Consideriamo una V.A. Z che rappresenta la somma dei punteggi ottenuti dal lancio di due dadi Bilanciati

Q1: PMF di Z?

La PMF ci dice la prob. della v.a. di assumere un dato valore, ovvero: $p_Z = P(\{Z = z\})$

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Siccome $Z = D_1 + D_2$

$$p_Z = \left[\begin{array}{cc} \text{Somma} & \text{Prob} \\ 2 & 1/36 \\ 3 & 2/36 \\ 4 & 3/36 \\ 5 & 4/36 \\ 6 & 5/36 \\ 7 & 6/36 \\ 8 & 5/36 \\ 9 & 4/36 \\ 10 & 3/36 \\ 11 & 2/36 \\ 12 & 1/36 \end{array}\right]$$

Q2 A: μ_Z

$$\mu_Z = E[Z] = \sum_{k \in \mathcal{X}_Z} x_k \cdot p(k)$$

$$\Rightarrow \mu_Z = \frac{1}{36}(2+12) + \frac{2}{36}(2+11) + \frac{3}{36}(4+10) + \frac{4}{36}(5+9) + \frac{5}{36}(6+8) + \frac{6}{36} \cdot 7$$

$$= \frac{125}{18} \simeq 7 \quad \mu_Z$$

$$\overline{Z}^2 = \sum_{k \in \mathcal{X}_Z} x_k^2 \cdot p(k) = \frac{803}{18} \sim 44.6 \quad \overline{Z}^2$$

$$\Rightarrow \sigma_Z^2 = \sum_{k \in \mathcal{X}_Z} (k - \mu_Z)^2 \cdot p(n)$$ ma essendo D_1 e D_2 indipendenti... $\sigma_Z^2 = \sigma_{D_1}^2 + \sigma_{D_2}^2 =$

$$\Rightarrow \mathcal{X}_{D_1} = \mathcal{X}_{D_2} = \{1,2,3,4,5,6\} \Rightarrow Var[D_1] = Var[D_2] = \sum_{k \in \mathcal{X}_D} (k - \mu_D)^2 \cdot p(k)$$

$$p_k = \frac{1}{6} \ \forall k \quad , \quad E[D] = \frac{1}{6} \cdot [1+2+\dots+6] = 3.5$$

$$Var[D] = E\left[(D - \mu_D)^2\right] = \overline{D}^2 - \mu_D^2 \qquad \overline{D}^2 \simeq 15.16$$

$$\Rightarrow \sigma_D = 15.16 - 12.25 = 2.91$$

$$\Rightarrow \sigma_Z^2 = 2.91 + 2.91 = 5.82 \quad \sigma_Z^2$$

Time 21