

Bonusová úloha 9 pre 2AIN1 (termín: 1. 12. 2025 do 23:59)

Odvzďavanie:

- ipynb súbor mailom na adresu beata.stehlikova@g.fmph.uniba.sk (nezabudnite "g" za zavináčom) s predmetom **PaS - 2AIN1 bonus 9 - meno**
- Dve možnosti, ako získať bonusový bod (číslovanie zo zadania cvičení, kópia zadaní je aj tu dolu):
 - príklady 2 a 3
 - príklad 10

Zadania:

Príklad 2

Testujte hypotézu o Poissonovom rozdelení pre dáta, ktoré vyjadrujú počet oznámení o úmrtiach v londýnskych novinách Times v jednotlivých dňoch počas troch rokov (dáta boli publikované v roku 1914). V prvom prípade ide o mužov vo veku nad 85 rokov, druhom prípade o ženy vo veku nad 80 rokov.

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times_1 = [484, 391, 164, 45, 11, 1]
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times_2 = [162, 267, 271, 185, 111, 61, 27, 8, 3, 1]
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V oboch prípadoch ide o početnosti hodnôt 0, 1, 2, atď.

Príklad 3

Testujte hypotézu o Poissonovom rozdelení pre dáta, ktoré vyjadrujú počet prípadov, kedy bol volajúci prepojený na nesprávne telefónne číslo (hodnoty sú približne spred 100 rokov) v sledovanom časovom úseku.

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telefon = [1, 5, 11, 14, 22, 43, 31, 40, 35, 20, 18, 12, 7, 6, 2]
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V tomto prípade početnosti zodpovedajú 2, 3, 4,... nesprávnym prepojeniam.

Príklad 10

Naprogramujte jedno kolo nasledovnej hry (to znamená, že ignorujeme inštrukciu "he is also the starter of the new game" – vždy sa odohrá len jedna hra). Spravte simulácie hry a zaznamenávajte, ktorý hráč vyhral (prvý, druhý alebo tretí). Testujte hypotézu, že pravdepodobnosti víťazstva všetkých troch hráčov sú rovnaké.

The Mang Kung (“blind men”) Dice Game is an old Chinese game played with six non-traditional dice. These dice, which are referred to as Mang Kung Dice, are marked as follows:

Die 1:	1					
Die 2:		2				
Die 3:			3			
Die 4:				4		
Die 5:					5	
Die 6:						6

where the symbol $\square$ represents BLANK. In other words, five faces of each *Mang Kung Die* are not marked. Only one face of each cube is marked according to the traditional way.

The Mang Kung Dice Game is still a fairly popular game among Chinese gamblers in Southern China and Hong Kong. In the next section we describe the game.

◆ DESCRIPTION OF THE GAME ◆

We first describe the game with three players. Each player contributes 7 units of stake into a “pool”. Thus, the total initial amount in the pool is 21 units. A player is randomly selected to start the first game. Each time six *Mang Kung Dice* are thrown simultaneously. The total face value of these dice is counted. This total face value (F) is then compared with the total amount in the pool (P). The possible outcomes and the corresponding player's actions are listed in Table 1.

Table 1. The three possible situations in the Mang Kung Dice Game.

Outcomes	Player's Actions
$F < P$	The Player can take the amount F from the pool. He then passes the dice to the next player on his left to continue the game.
$F > P$	The Player has to top up the pool by the difference, $(F - P)$. He then passes the dice to the next player to continue the game.
$F = P$	The Player wins the game. He receives the amount P from the pool. Moreover, each of the other players has to pay him an amount F as “bonus”. He is also the starter of the next new game.