Z1/

A) $P\left(X \geq 1\frac{1}{5}E(X)\right) = \frac{5E(X)}{6E(X)} = \frac{5}{6}$

B) $P(|X - E(X)| \geq \frac{1}{10}E(X)) = \frac{var(X)}{(\frac{1}{10}E(X))^2} = \frac{np(1-p)}{\frac{1}{100}(np)^2} = \frac{n100(p-p^2)}{n^2p^2} = \frac{100\frac{1}{4}}{\frac{1}{4}n} = \frac{100}{n}$

Dokładne wyniki:

Dla n = 100

$P\left(X \geq 1\frac{1}{5}E(X)\right) = 0{,}02844$

$P\left(|X - E(X)| \geq \frac{1}{10}E(X)\right) = 0{,}3682$

Dla n = 1000

$P\left(X \geq 1\frac{1}{5}E(X)\right) \approx 0$

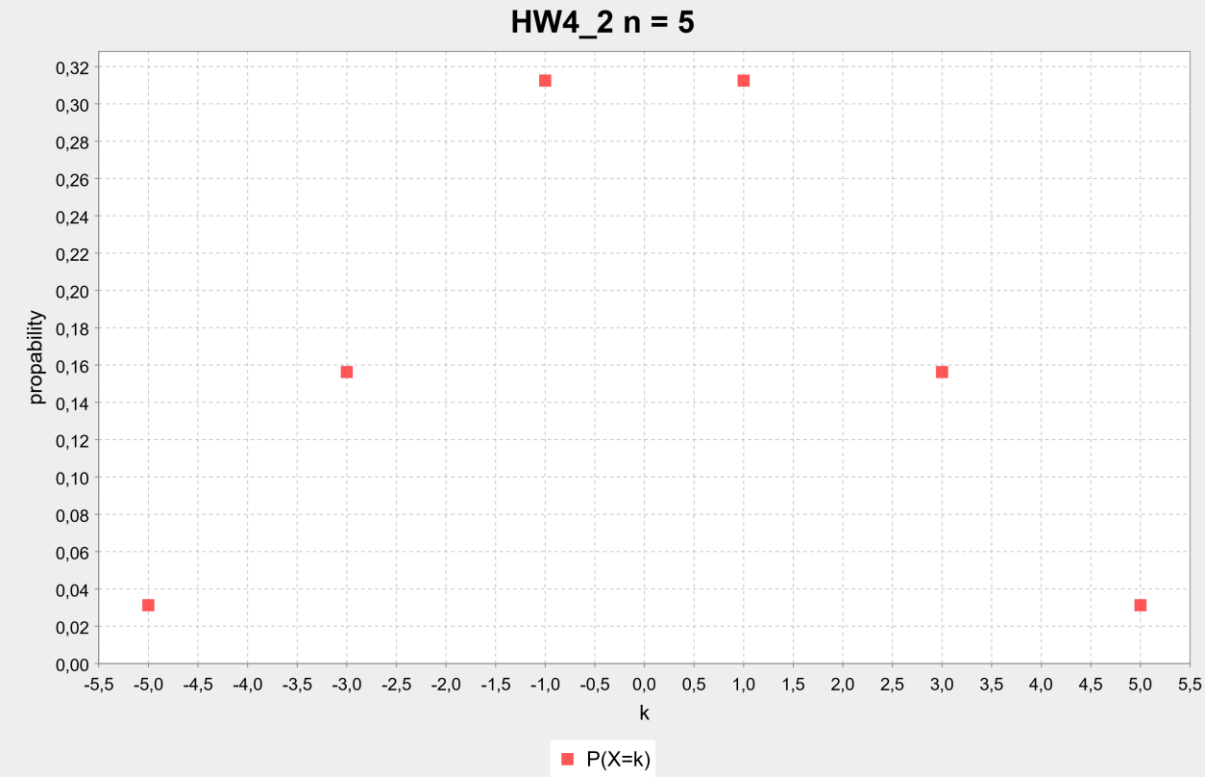
$P\left(|X - E(X)| \geq \frac{1}{10}E(X)\right) = 0{,}00174$

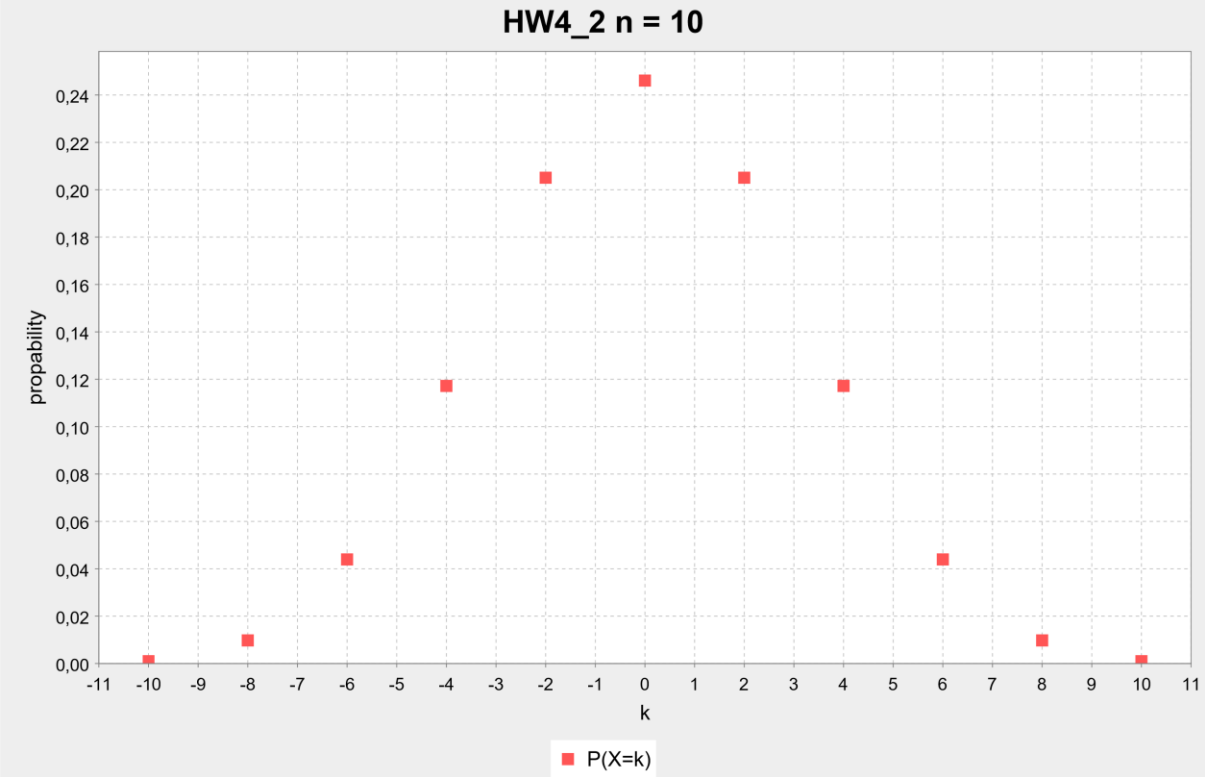
Dla n = 1000

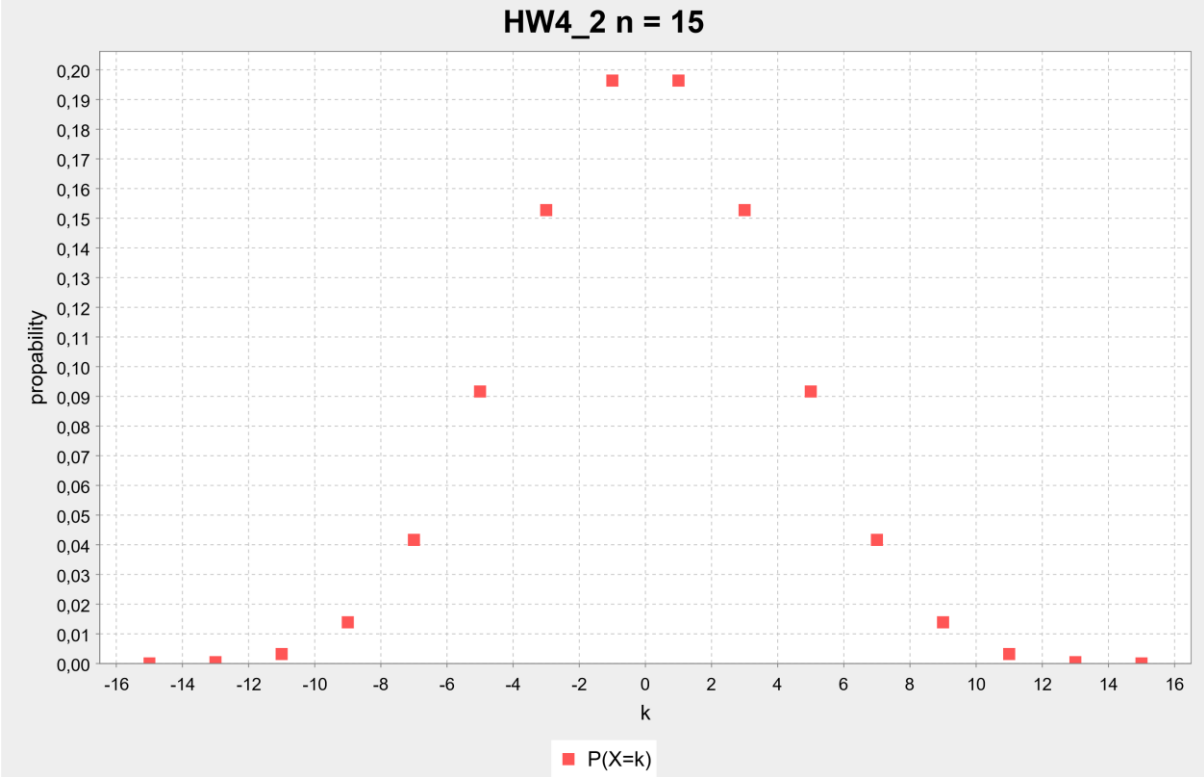
$P\left(X \geq 1\frac{1}{5}E(X)\right) \approx 0$

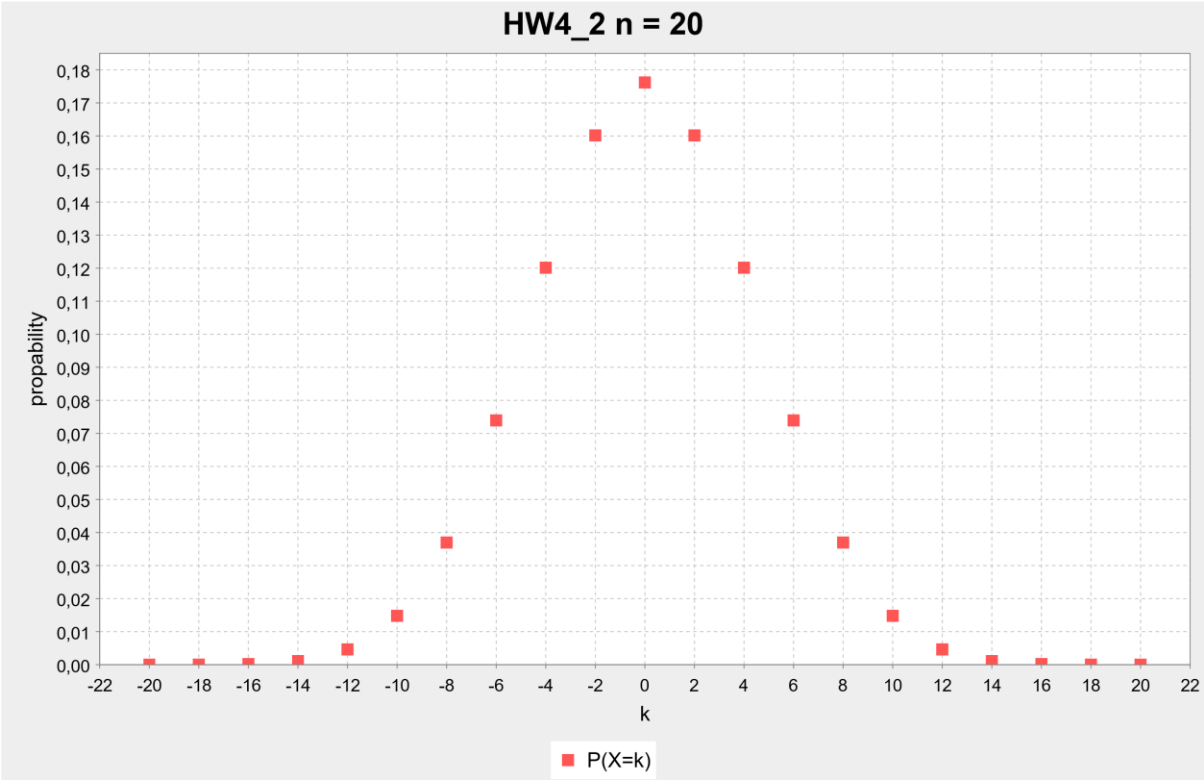
$P\left(|X - E(X)| \geq \frac{1}{10}E(X)\right) \approx 0$

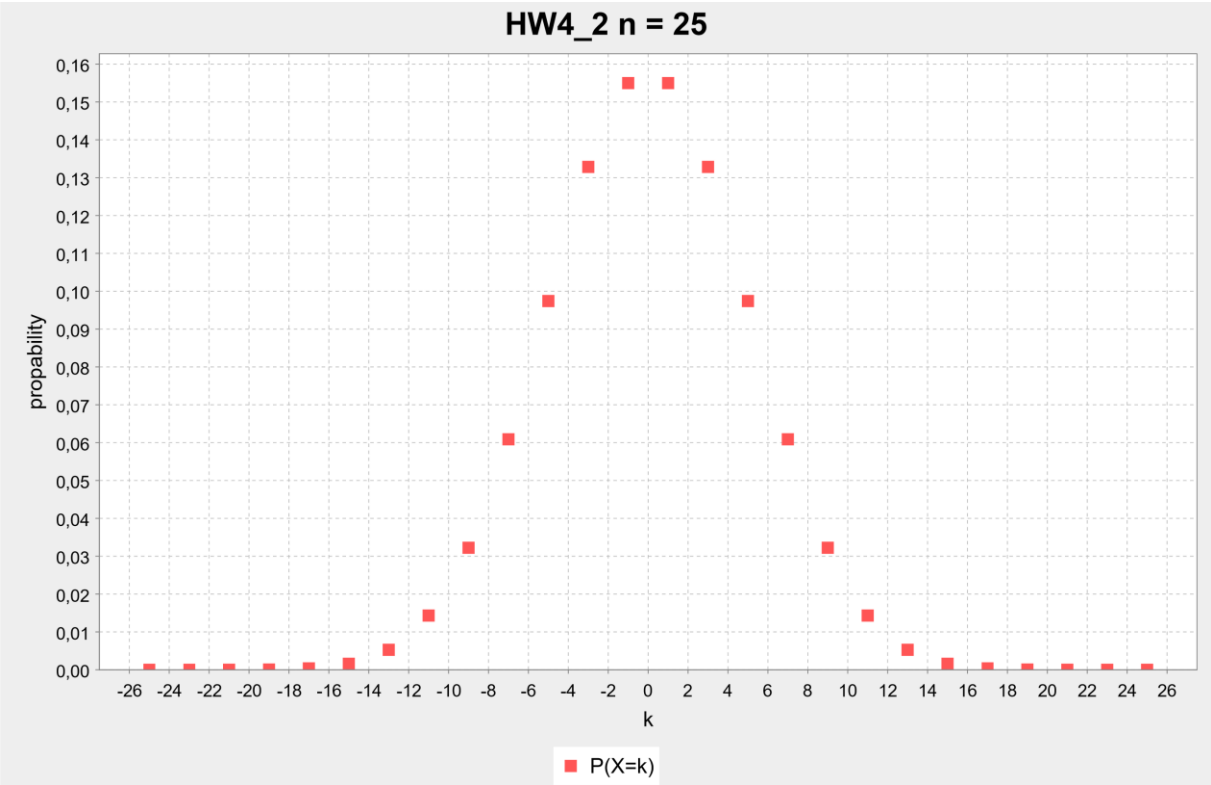
Z2/

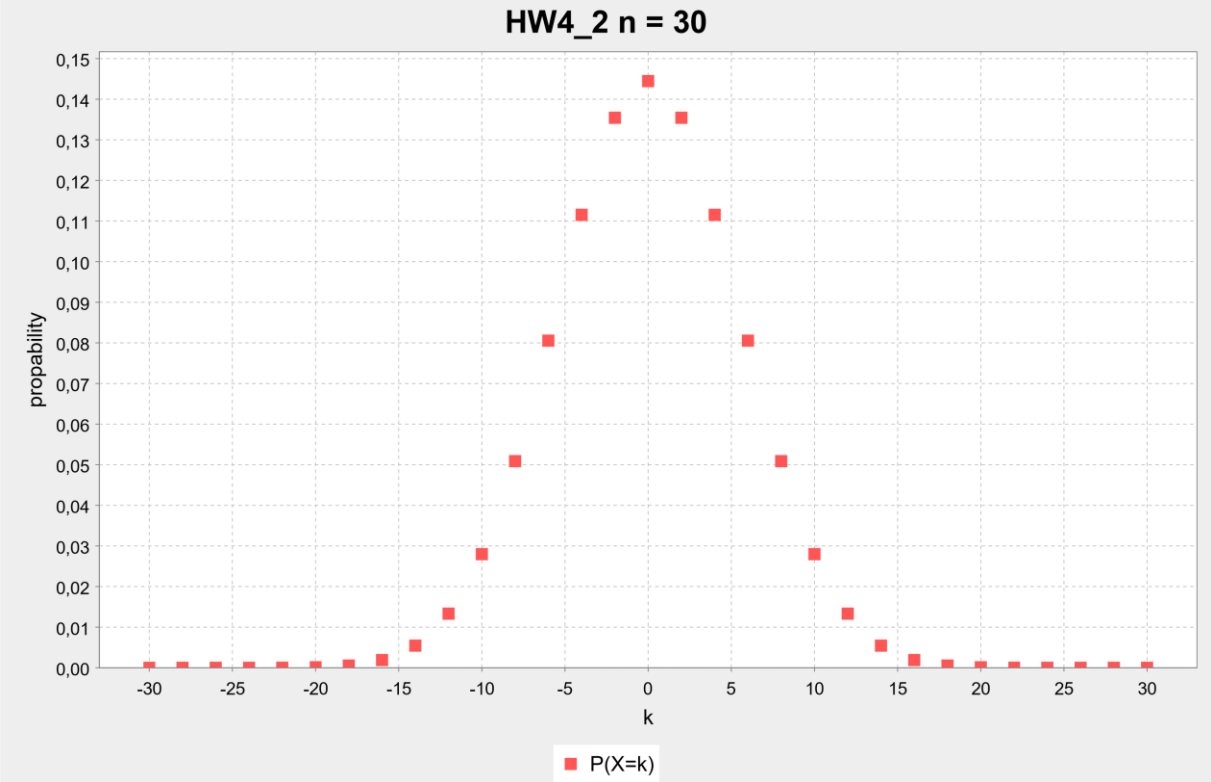

HW4_2 n = 5
propability
0,32
0,30
0,28
0,26
0,24
0,22
0,20
0,18
0,16
0,14
0,12
0,10
0,08
0,06
0,04
0,02
0,00
-5,5 -5,0 -4,5 -4,0 -3,5 -3,0 -2,5 -2,0 -1,5 -1,0 -0,5 0,0 0,5 1,0 1,5 2,0 2,5 3,0 3,5 4,0 4,5 5,0 5,5
k
P(X=k)

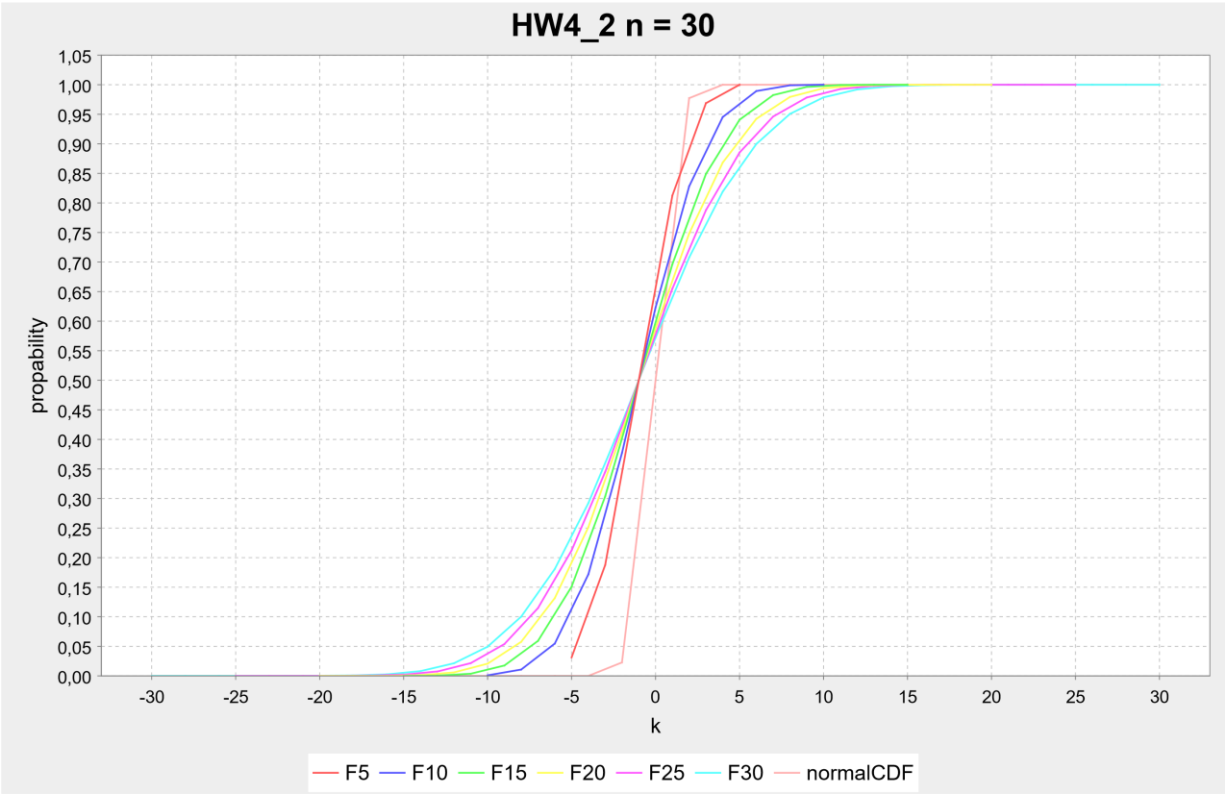

HW4_2 n = 10
propability
0,24
0,22
0,20
0,18
0,16
0,14
0,12
0,10
0,08
0,06
0,04
0,02
0,00
-11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11
k
P(X=k)


HW4_2 n = 15
propability
k
P(X=k)


HW4_2 n = 20
propability
k
P(X=k)

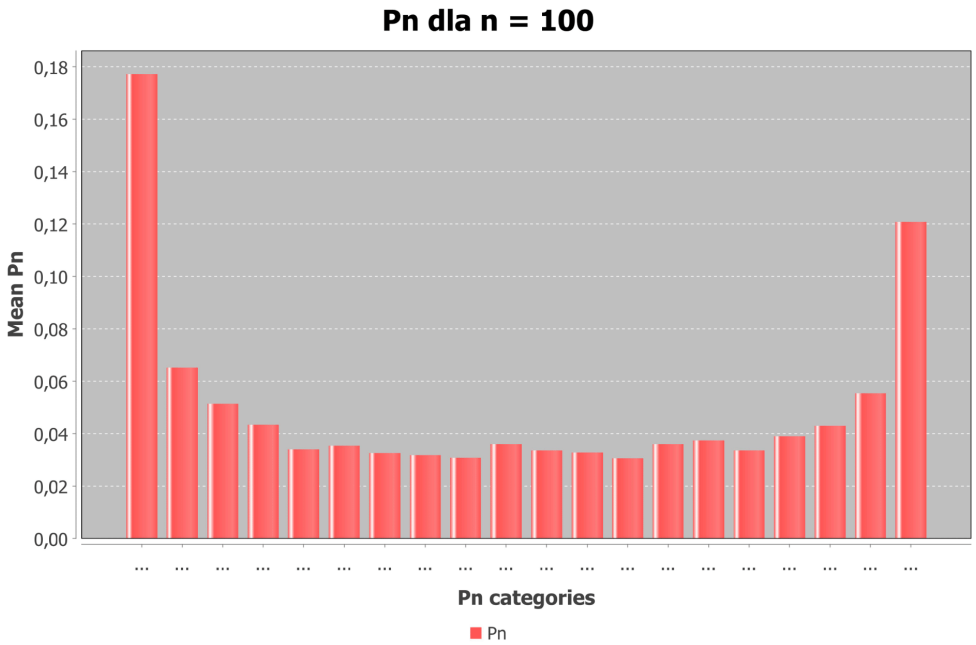

HW4_2 n = 25
propability
k
P(X=k)

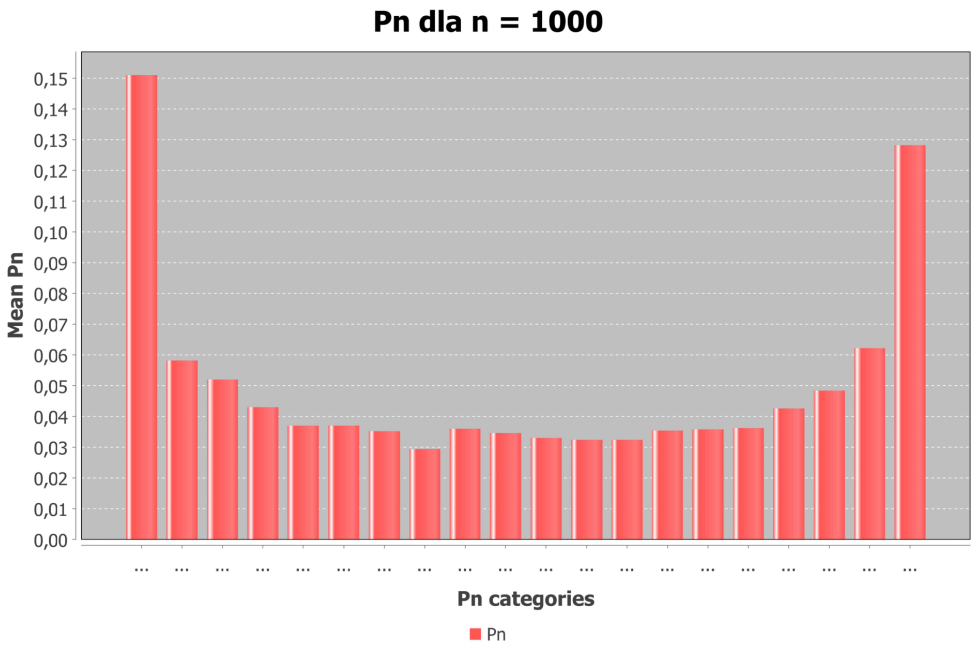

HW4_2 n = 30
propability
k
P(X=k)

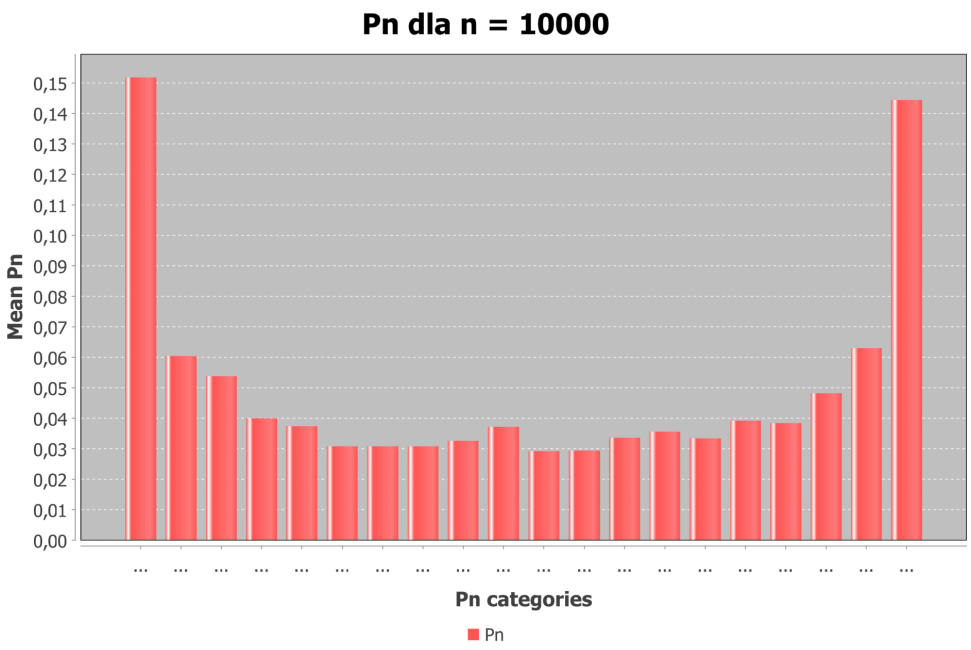


Nie mam wykresu dla n = 100 ponieważ funkcja nie mogła sobie poradzić z na tyle dużymi liczbami. 😟

Z3/


Pn dla n = 100
Mean Pn
0,18
0,16
0,14
0,12
0,10
0,08
0,06
0,04
0,02
0,00
Pn categories
Pn


Pn dla n = 1000
Mean Pn
0,15
0,14
0,13
0,12
0,11
0,10
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0,00
Pn categories
Pn


Pn dla n = 10000
Mean Pn
0,15
0,14
0,13
0,12
0,11
0,10
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0,00
Pn categories
Pn