Estatística descritiva

Normalização dos dados

Prof. Dr. Tetsu Sakamoto Instituto Metrópole Digital - UFRN Sala A224, ramal 182 Email: tetsu@imd.ufrn.br

Slides e notebook em:

github.com/tetsufmbio/IMD0033/

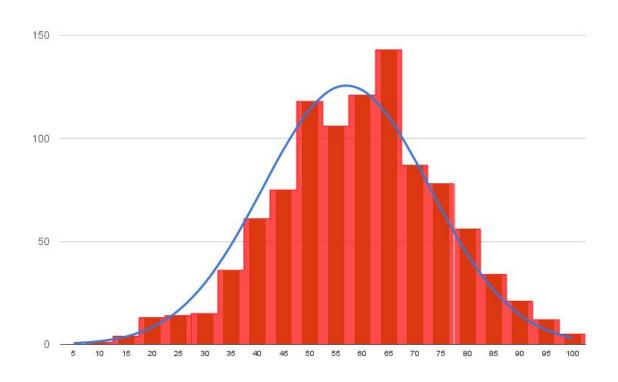
Objetivos da aula

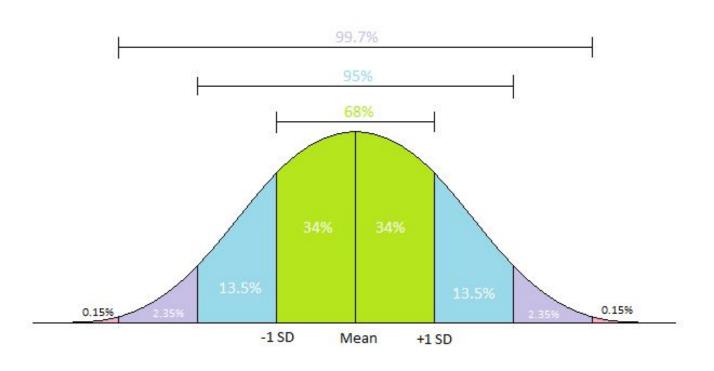
Noções de normalização dos dados

Z-score;

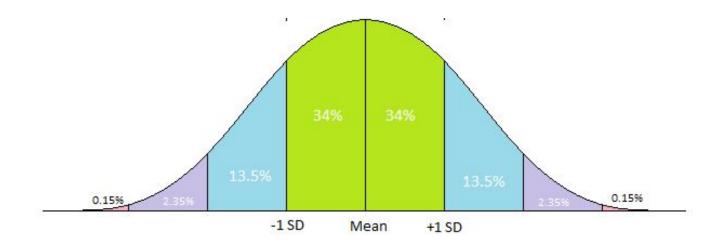
Medidas de dispersão dos dados:

- Amplitude;
- Amplitude entre os quartis;
- Variância e desvio padrão.

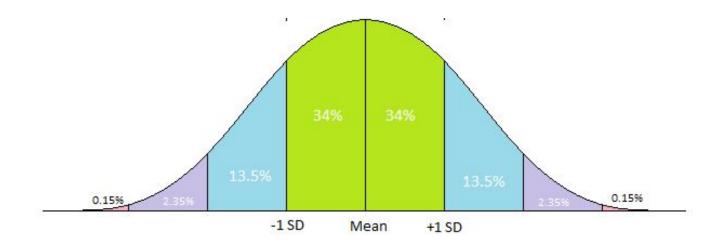




Média=60; desvio padrão=15; quantos estão abaixo de 75? 84%

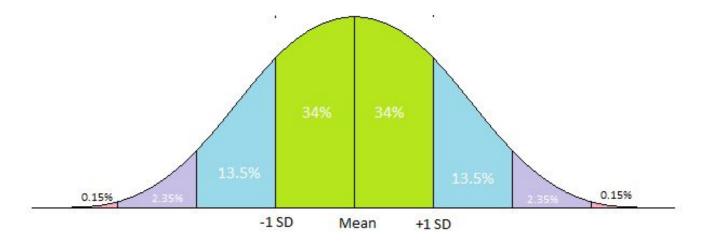


Média=60; desvio padrão=15; se eu tirei 80...



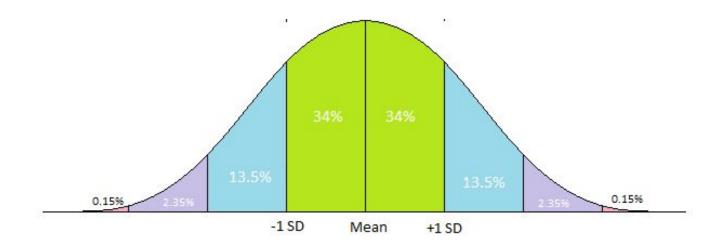
Função da distribuição normal

$$F(x) = \frac{1}{\sigma\sqrt{2\pi}}e^{-(x-\mu)^2/2\sigma^2}$$



Se eu tirei 80, quantos desvios padrão estou da média?

Média=60; desvio padrão=15

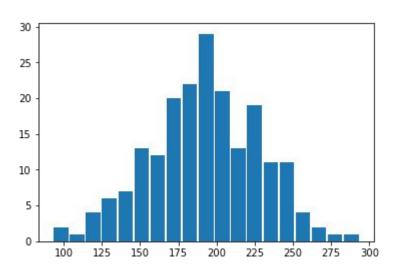


Z-score

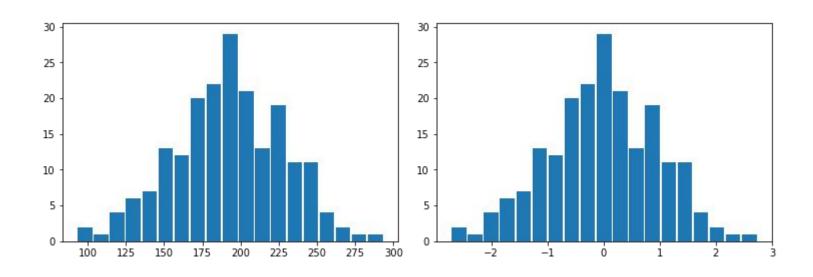
Z-score \rightarrow unidades de desvio padrão de um determinado valor em um conjunto de dados de média μ e desvio padrão σ .

$$z = \frac{x - \mu}{\sigma}$$

O que acontece se eu aplicar o z-score em todo dado...?



O que acontece se eu aplicar o z-score em todo dado...?



Qual é a média e o desvio padrão dos dados transformados em z-score?

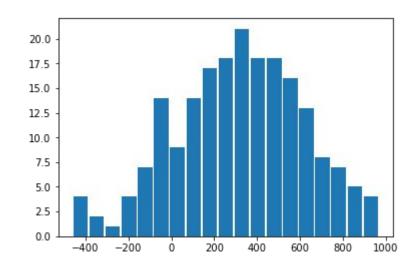
$$\mu = 0$$

$$\sigma = 1$$

Calcule o z-score para cada valor de um outro conjunto de dados...

Qual foi a média?

Qual foi o desvio padrão?



Quando os dados são transformados em z-score...

Ele se transforma em um conjunto de dados de:

- $\mu = 0$
- $\sigma = 1$

Transformar os dados em Z-score é uma forma de padronizar (normalizar) os dados;

Gera uma distribuição normal padrão.



Área sob a curva de uma distribuição normal padrão

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} - \infty \le x \le \infty$$

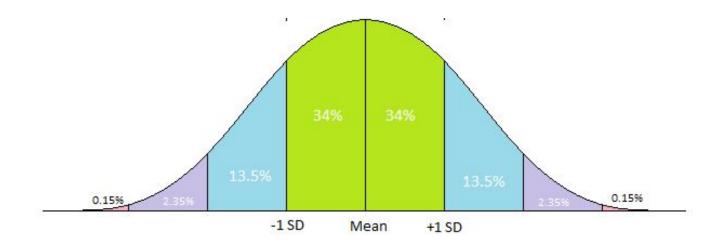
$$= \frac{1}{1 \times \sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-0}{1}\right)^2} - \infty \le x \le \infty$$

$$= \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}(z)^2} - \infty \le z \le \infty$$

2.4	1 000 000
3.3 0.0005 0.0005 0.0005 0.0006 0.0006 0.0006 0.0006 0.0006 0.0006 0.0006 0.0006 0.0006 0.0006 0.0006 0.0006 0.0008 0.0008 0.0008 3.1 0.0010 0.0009 0.0009 0.0009 0.0008	0.08 0.09 0.0003 0.0002
3.2 0.0007 0.0007 0.0006 0.0006 0.0006 0.0008 0.0001 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0012 0.0012 0.0013 0.0012 0.0023 <td>0.0003 0.0002</td>	0.0003 0.0002
3.1 0.0010 0.0009 0.0009 0.0009 0.0008 0.0008 0.0008 0.0008 0.0008 0.0008 0.0008 0.0008 0.0008 0.0001 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0011 0.0012 0.0012 0.0012 0.0012 0.0012 0.0012 0.0012 0.0023 0.0033 0.0033 0.0033 0.0033 0.0033 0.0033 0.0033 0.0032 0.0034 0.0043 0.0043 0.0043 0.0043 0.0043 0.0043 0.0043 0.0043 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 0.0052 <th>0.0004 0.0005</th>	0.0004 0.0005
Section Sect	0.0007 0.0007
2.9 0.0019 0.0018 0.0018 0.0017 0.0016 0.0016 0.0015 0.0015 2.8 0.0026 0.0023 0.0023 0.0023 0.0023 0.0023 0.0023 0.0023 0.0023 0.0023 0.0023 0.0023 0.0030 0.0029 0.0028 2.6 0.0047 0.0043 0.0043 0.0043 0.0043 0.0043 0.0043 0.0043 0.0039 0.0038 2.2 0.0062 0.0060 0.0069 0.0067 0.0055 0.0054 0.0069 0.0069 2.4 0.0062 0.0060 0.0078 0.0075 0.0073 0.0079 0.0079 2.2 0.0109 0.0130 0.0132 0.0129 0.0129 0.0191 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0119 0.0111 0.0119 0.0111 0.	0.0010 0.0010
2.28 0.00226 0.0025 0.0024 0.0023 0.0023 0.0024 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0029 0.0028 0.0041 0.0041 0.0041 0.0040 0.0039 0.0037 0.0057 0.0050 0.0052 0.0051 2-2.4 0.0082 0.0080 0.0078 0.0075 0.0071 0.0060 0.0082 0.0082 2-2.3 0.0107 0.0104 0.0099 0.0096 0.0091 0.0098 0.0091 0.0098 0.0091 0.0091 0.0091 0.0096 0.0091 0.0091 0.0096 0.0091	0.0014 0.0014
2.27 0.0035 0.0034 0.0033 0.0032 0.0031 0.0030 0.0029 0.0028 2.26 0.0047 0.0044 0.0044 0.0044 0.0044 0.0044 0.0045 0.0059	0.0020 0.0019
2.6 0.0047 0.0045 0.0044 0.0043 0.0041 0.0040 0.0039 0.0052 2.5 0.0050 0.0059 0.0057 0.0055 0.0050 0.0052 0.0052 2.4 0.0082 0.0080 0.0078 0.0075 0.0071 0.0069 0.0068 2.2 0.0197 0.0100 0.0099 0.0060 0.0094 0.0060 0.0060 0.0060 0.0060 0.0060 2.2 0.0139 0.0138 0.0132 0.0129 0.0122 0.0134 0.0116 2.1 0.0179 0.0166 0.0162 0.0193 0.0134 0.0150 2.1 0.0179 0.0166 0.0162 0.0194 0.0150 2.1 0.0228 0.0222 0.0274 0.0268 0.0262 0.0250 0.0194 1.1 0.0228 0.0251 0.0344 0.0358 0.0359 0.0359 0.0344 1.1 0.0466 0.0457 0.0227 0.0418 0.0409 <th>0.0027 0.0026</th>	0.0027 0.0026
2.4 0.0082 0.0080 0.0078 0.0075 0.0071 0.00691 0.0088 2.2 3 0.0107 0.0108 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0018 0.0116 0.0116 0.0152 0.0118 0.0116 0.0162 0.0174 0.0028 0.0221 0.0174 0.0288 0.0262 0.0228 0.0274 0.0288 0.0262 0.0250 0.0244 1.8 0.0359 0.0359 0.0374 0.0288 0.0262 0.0228 0.0252 0.0314 0.0307 1.16 0.0589 0.0357 0.0526 0.0514 0.0509 0.0491 0.0392 0.0334 1.15 0.0688 0.0557 0.0526 0.0516 0.0509 0.0495 0.0485 0.0475 1.16 0.0688 0.0597 0.0526 0.0514 0.0509 0.0495	0.0037 0.0036
2.3 0.0197 0.0194 0.0194 0.0199 0.0099 0.0099 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0098 0.0012 0.0119 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 0.0111 <th>0.0049 0.0048</th>	0.0049 0.0048
2.22 0.0139 0.0136 0.0132 0.0129 0.0122 0.0112 0.0116 0.0161 2-21 0.0179 0.0174 0.0168 0.0152 0.0154 0.0154 0.0154 0.0154 0.0154 0.0154 0.0152 0.0229 0.0222 0.0271 0.0268 0.0226 0.0226 0.0226 0.0226 0.0226 0.0226 0.0226 0.0226 0.0250 0.0244 1.18 0.0287 0.0281 0.0274 0.0288 0.0226 0.0224 0.0280 0.0222 0.0314 0.0307 0.0282 0.0282 0.0232 0.0314 0.0307 0.0364 0.0141 0.0409 0.0492 0.0324 0.0141 0.0409 0.0493 0.0392 0.0334 0.0141 0.0609 0.0493 0.0493 0.0153 0.0505 0.0495 0.0485 0.0451 0.0616 0.0505 0.0495 0.0452 0.0415 0.0616 0.0505 0.0495 0.0481 0.0416 0.0423 0.0416 0.0434 <td< th=""><th>0.0066 0.0064</th></td<>	0.0066 0.0064
2.1 0.0176 0.0174 0.0170 0.0166 0.0182 0.0182 0.0154 0.0150 2.0 0.0228 0.0228 0.0227 0.0212 0.0202 0.0208 0.0209 0.0197 0.0197 0.0192 1.9 0.0281 0.02281 0.0224 0.0268 0.0252 0.0256 0.0230 0.0231 0.0231 0.0232 0.02314 0.0331 1.17 0.0446 0.0439 0.0257 0.0516 0.0516 0.0516 0.0516 0.0516 0.0516 0.0506 0.0618 0.0407 0.0448 0.0435 0.0417 0.0448 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0418 0.0408 0.0593 0.0277 0.0486 0.0593 0.0527 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485 0.0485<	0.0087 0.0084
2.0 0.02228 0.02222 0.02717 0.02726 0.02020 0.0197 0.0192 1.9 0.0287 0.0288 0.0268 0.0250 0.0254 0.0818 0.0593 0.0354 0.0351 0.0354 0.0358 0.0329 0.0322 0.0334 1.1 0.0548 0.0557 0.0526 0.0516 0.0505 0.0495 0.0452 1.1 0.0548 0.0557 0.0526 0.0518 0.0505 0.0495 0.0495 1.1 0.0588 0.0589 0.0883 0.06994 0.0583 0.0698 0.0883 1.1 0.0589 0.0581 0.0691 0.06918 0.06901 0.0583 0.06989 0.0883 1.1 0.0536 0.0513 0.0690 0	0.0113 0.0110
-1.9 0.0287 0.0281 0.0274 0.0268 0.0268 0.0262 0.0256 0.0250 0.0241 -1.8 0.0399 0.0351 0.0334 0.0332 0.0322 0.0314 0.0301 -1.7 0.0446 0.0436 0.0427 0.0418 0.0409 0.0401 0.0392 0.0384 -1.6 0.0548 0.0557 0.0561 0.0560 0.0698 0.0485 0.0445 0.0445 0.0445 0.0445 0.0445 0.0445 0.0445 0.0445 0.0445 0.0445 0.0445 0.0451 0.0688 0.0593 0.0503 0.0694 0.0794 0.0794 0.0794 0.0794 0.0794 0.0794 0.0794 0.0794 0.0793 0.0791 0.0883 0.0868 0.0853 0.0868 0.0853 0.0868 0.0853 0.0868 0.0853 0.0868 0.0853 0.0868 0.0853 0.0868 0.0853 0.0868 0.0853 0.0868 0.0853 0.0868 0.0852 0.0863 0.0864	0.0146 0.0143
-1.8 0.0399 0.0391 0.0391 0.0392 0.0322 0.0312 0.0312 0.0312 0.0312 0.0302 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0332 0.0343 0.0618 0.0505 0.0445 0.0608 0.0475 0.0415 0.0505 0.0495 0.0485 0.0475 0.0768 0.0781 0.0608 0.0693 0.0681 0.0694 0.0483 0.0603 0.0618 0.0694 0.0934 0.0918 0.0694 0.0738 0.0744 0.0738 0.0721 0.0708 -1.3 0.0688 0.0993 0.0131 0.0181 0.0094 0.0181 0.0698 0.0883 0.0089 0.0883 -1.2 0.1537 0.1314 0.1292 0.1271 0.1250 0.1536 0.1612 0.1261 0.1250 0.1236 0.1212 0.12120 0.12120 0.1210 0.1416 0.1446 <	0.0188 0.0183
-1.7 0.0446 0.0436 0.0427 0.0418 0.0409 0.0401 0.0392 0.0384 -1.6 0.0488 0.0557 0.0526 0.0516 0.0501 0.0485 0.0445 0.0455 0.0455 0.0455 0.0455 0.0455 0.0455 0.0525 0.0516 0.0508 0.0688 0.0695 0.0773 0.0774 0.0774 0.0774 0.0774 0.0774 0.0774 0.0774 0.0774 0.0774 0.0774 0.07721 0.0773 -1.3 0.0968 0.0951 0.0934 0.0918 0.0901 0.0883 0.0883 -1.2 0.1151 0.1133 0.1714 0.1039 0.1157 0.1230 0.1721 -1.1 0.1357 0.1339 0.1515 0.1429 0.12210 0.1230 0.1230 -1.1 0.1357 0.1339 0.1515 0.1436 0.1446 0.1443 -1.0 0.1887 0.1584 0.1738 0.1711 0.1685 0.1620 -0.2 </th <th>0.0239 0.0233</th>	0.0239 0.0233
1.6 0.0548 0.0577 0.0526 0.0516 0.0509 0.0495 0.0485 0.0475 1.5 0.0888 0.0655 0.0643 0.0630 0.0618 0.0606 0.0594 0.0584 1.4 0.0898 0.0693 0.0778 0.0774 0.0749 0.0735 0.0721 0.0708 1.1 0.0896 0.0893 0.0891 0.0891 0.0891 0.0889 0.0883 1.2 0.1515 0.1133 0.1112 0.1088 0.1088 0.0891 0.0883 1.1 0.1357 0.1336 0.1314 0.1292 0.1271 0.1230 0.1210 1.0 0.1887 0.1552 0.1539 0.1515 0.1492 0.1184 0.1446 0.1423 0.0 0.1841 0.1812 0.1753 0.1575 0.1492 0.1184 0.1446 0.1423 0.0 0.1841 0.1812 0.1753 0.1452 0.1418 0.1423 0.0 0.1812 0.1812 <td>0.0301 0.0294</td>	0.0301 0.0294
-1.5 0.0688 0.0655 0.0431 0.0530 0.0618 0.0660 0.0594 0.0582 -1.4 0.0898 0.0753 0.0774 0.0774 0.0774 0.07721 0.0773 -1.3 0.0989 0.0991 0.0981 0.0901 0.0883 0.0889 0.0883 -1.2 0.1151 0.1131 0.1030 0.1073 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1210 0.1387 0.1357 0.1339 0.1515 0.1492 0.1210 0.1446 0.1443 0.1446 0.1443 0.1446 0.1443 0.0144 0.1446 0.1443 0.0144 0.1446 0.1443 0.0194 0.0208 0.2191 0.2081 0.2081 0.2081 0.2081 0.2141 0.0144 0.1446 0.1443 0.0194 0.1922 0.1736 0.2141 0.229	0.0375 0.0367 0.0465 0.0455
-1.4 0.0898 0.0793 0.0778 0.0764 0.0749 0.0735 0.0721 0.0708 -1.3 0.0988 0.0953 0.0954 0.0918 0.0991 0.0891 0.0895 0.0889 0.0885 -1.2 0.1151 0.1131 0.1112 0.1093 0.1079 0.1056 0.1038 0.1020 -1.1 0.1357 0.1335 0.1314 0.1220 0.1271 0.1230 0.1210 -1.0 0.1887 0.1592 0.1539 0.1515 0.1492 0.1440 0.1446 0.1437 -0.9 0.1811 0.1818 0.1759 0.1519 0.1492 0.1419 0.1446 0.1423 -0.9 0.1811 0.1887 0.1782 0.1782 0.1782 0.1782 0.1782 -0.7 0.2220 0.2236 0.2237 0.2256 0.2266 0.2266 0.2256 0.2256 0.2256 0.2256 0.2256 0.2256 0.2256 0.2256 0.2256 0.2256 0.2256 <td>0.0403 0.0453</td>	0.0403 0.0453
-1.3 0.0988 0.0991 0.0991 0.0918 0.0901 0.0885 0.0889 0.0893 -1.2 0.1151 0.1193 0.1019 0.1098 0.1018 0.1028 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1038 0.1018 0.1202 0.1271 0.1251 0.1230 0.1210 0.1841 0.1385 0.1539 0.1515 0.1451 0.1446 0.1443 0.1441 0.1481 0.1788 0.1762 0.1739 0.1711 0.11841 0.1481 0.1481 0.1788 0.7662 0.1739 0.1711 0.1499 0.1922 0.8 2.2191 0.2090 0.2388 0.2338 0.2327 0.2296 0.2266 0.2246 0.2419 0.9199 0.1922 0.6 0.2743 0.2676 0.2443 0.2611 0.2486 0.2216 0.2264 0.2516 0.2446 0.2541 0.2517 0.2378 0.2328 0.2322 0.2326 0.2226<	0.0694 0.0681
-1.2 0.1151 0.1131 0.1131 0.1192 0.1093 0.1075 0.1056 0.1038 0.1020 -1.1 0.1357 0.1334 0.1292 0.1271 0.1230 0.1210 0.1230 0.1210 0.1230 0.1210 0.1230 0.1210 0.1230 0.1210 0.1482 0.1489 0.1446 0.1446 0.1446 0.1441 0.1481 0.1481 0.1481 0.1482 0.1490 0.1481 0.1472 0.1749 0.1749 0.1480 0.1446 0.1432 0.0481 0.2473 0.2766 0.2472 0.7286 0.2743 0.2709 0.2586 0.2227 0.2206 0.2266 0.2266 0.2266 0.2266 0.2266 0.2264 0.2266 0.2264 0.2266 0.2264 0.2464 0.3449 0.3462 0.2372 0.33321 0.3303 0.3303 0.32730 0.3274 0.3327 0.3323 0.3333 0.3303 0.33021 0.3322 0.3323 0.33333 0.3300 0.3669 0.3522 0.3594	0.0838 0.0823
-1.1 0.1397 0.1335 0.1334 0.1292 0.1271 0.1221 0.1230 0.1210 -1.0 0.1588 0.1592 0.1515 0.1492 0.1496 0.1446 0.1423 -0.9 0.1841 0.1584 0.1788 0.1762 0.1739 0.1711 0.1865 0.1680 -0.8 0.2191 0.2090 0.2001 0.2033 0.2005 0.1711 0.1189 0.1997 0.1919 0.1922 -0.7 0.2420 0.2389 0.2388 0.2327 0.2296 0.2266 0.2246 0.2246 0.2446 0.2541 -0.5 0.3085 0.3550 0.3015 0.2981 0.2946 0.2212 0.2278 0.2322 0.2322 -0.3 0.3247 0.3353 0.3303 0.3005 0.3587 0.3333 0.3306 0.3582 0.3232 0.3333 0.3006 0.3522 0.3334 0.3353 0.3364 0.3232 0.3354 0.3357 0.1 0.4602 0.4552	0.1003 0.0985
-1.0 0.1587 0.1562 0.1592 0.1516 0.1492 0.1494 0.1446 0.1426 -0.9 0.1441 0.1848 0.1789 0.1762 0.1792 0.1717 0.1485 0.1685 -0.8 0.2119 0.2090 0.2001 0.2033 0.2005 0.1777 0.1492 0.1922 -0.7 0.2420 0.2380 0.2327 0.2266 0.2266 0.2236 0.2236 -0.5 0.3685 0.3090 0.3015 0.2881 0.2841 0.2471 0.2246 0.2236 0.2236 -0.4 0.3446 0.3430 0.3372 0.3381 0.3381 0.3382 0.3237 0.3362 0.3277 0.2243 -0.4 0.3446 0.3430 0.3372 0.3356 0.3300 0.3282 0.3227 0.2248 -0.2 0.2307 0.4183 0.4490 0.3800 0.3302 0.0132 0.3974 0.3364 -0.1 0.5000 0.4562 0.4552 0.4522	0.1190 0.1170
0.9 0.1841 0.1844 0.1788 0.17692 0.1739 0.17711 0.1685 0.1690 0.8 0.2191 0.2090 0.2091 0.2033 0.2095 0.1977 0.1919 0.1929 0.7 0.2420 0.22389 0.2388 0.2327 0.2296 0.2266 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2246 0.2446 0.2461 0.2284 0.2578 0.2464 0.2412 0.22877 0.2246 0.2241 0.2426 0.2246 0.2421 0.2287 0.2248 0.2426 0.2446 0.2440 0.4440 0.4340 0.3452 <t< td=""><td>0.1401 0.1379</td></t<>	0.1401 0.1379
-0.8 0.2119 0.2090 0.2091 0.2033 0.2005 0.1917 0.1922 -0.7 7.2420 0.2388 0.2227 0.2296 0.2266 0.2266 0.2266 0.2266 0.2266 0.2266 0.2266 0.2266 0.2266 0.2266 0.2266 0.2266 0.2243 0.2676 0.2641 0.2611 0.2578 0.2243 0.2577 0.2843 -0.4 0.3446 0.3498 0.3372 0.3381 0.3300 0.3284 0.3228 0.3192 -0.2 0.3427 0.3480 0.3742 0.3307 0.3500 0.3522 0.3544 0.3553 0.3544 0.3554 0.3554 0.3554 0.3554 0.3564 0.3554 0.3554 0.3554 0.3554 0.3564 0.3560 0.3560 0.3564 0.3563 0.3574 0.3956 0.4667 0.4660 0.4660 0.4660 0.4760 0.4560 0.4560 0.4760 0.4580 0.4460 0.4761 0.4721 0.4721 0.4721 0.4721	0.1635 0.1611
-0.6 0.2743 0.2709 0.2766 0.2643 0.2611 0.2578 0.2466 0.2514 -0.5 0.3059 0.3015 0.2881 0.2948 0.2912 0.2377 0.2843 -0.4 0.3449 0.3019 0.3322 0.3330 0.3224 0.3228 0.3192 -0.3 0.3221 0.3783 0.3745 0.3770 0.3690 0.3522 0.3534 0.3573 -0.1 0.4027 0.4168 0.4129 0.4090 0.4092 0.4013 0.3974 0.3356 -0.0 0.5000 0.4520 0.4483 0.4443 0.4430 0.4434 0.4334 0.4432 0.4448 0.4430 0.4434 0.4361 0.4721 0.0 0.5000 0.4900 0.4920 0.4883 0.4444 0.4801 0.4761 0.4721 0.1 0.5000 0.5040 0.4880 0.5443 0.4401 0.4761 0.4721 0.5230 0.5279 0.5239 0.5279 0.5279 0.5279	0.1894 0.1867
-0.5 0.3085 0.3090 0.3075 0.2881 0.2848 0.2942 0.2842 0.2827 0.2843 -0.4 0.3446 0.3496 0.3792 0.3336 0.3300 0.3264 0.3228 0.3192 -0.3 0.3227 0.3783 0.3707 0.3696 0.3562 0.3594 0.3597 -0.2 0.4227 0.4188 0.4490 0.4062 0.4013 0.3794 0.3393 -0.1 0.4692 0.4452 0.4483 0.4443 0.4404 0.4394 0.4320 -0.0 0.5000 0.5496 0.5290 0.5120 0.5190 0.5190 0.5279 0.0 0.5000 0.5496 0.5690 0.5172 0.5557 0.5596 0.5597 0.5575 0.5597 0.5596 0.5696 0.5676 0.5779 0.5779 0.5277 0.5577 0.5597 0.5656 0.6576 0.5777 0.5777 0.5596 0.6561 0.6576 0.6576 0.6576 0.6576 0.6576 0.65	0.2177 0.2148
-0.4 0.3446 0.3499 0.3272 0.3336 0.3300 0.3264 0.3228 0.3192 -0.3 0.3212 0.3783 0.3797 0.3569 0.3524 0.3275 -0.2 0.4227 0.4418 0.4129 0.4090 0.4052 0.4013 0.3974 0.3596 -0.1 0.4692 0.4458 0.4443 0.4443 0.4443 0.4434 0.4324 -0.0 0.5090 0.4590 0.4522 0.4483 0.4441 0.4681 0.4721 0.0 0.5090 0.5090 0.4520 0.4880 0.4840 0.4801 0.4761 0.4721 0.0 0.5090 0.5090 0.5120 0.5190 0.5239 0.527	0.2483 0.2451
4.3 0.3821 0.3783 0.3745 0.3707 0.3669 0.3632 0.3594 0.3537 0.2 0.4207 0.4169 0.4009 0.4069 0.4052 0.4139 0.4009 0.4069 0.4032 0.4040 0.4052 0.4432 0.4443 0.4444 0.4434 0.4444 0.4384 0.4420 0.4889 0.4444 0.4434 0.4444 0.4384 0.4440 0.4384 0.4781 0.4721 0.4720 0.4889 0.4440 0.4384 0.4771 0.4721 0.6278 0.5000 0.5000 0.5400 0.5800 0.5132 0.5773 0.5279	0.2810 0.2776
-0.2 0.4207 0.4168 0.4129 0.4090 0.4092 0.4013 0.3974 0.3936 -0.1 0.4020 0.44583 0.4443 0.4434 0.4343 0.4434 0.4343 0.4343 0.4434 0.4343 0.4434 0.4343 0.4434 0.4434 0.4343 0.44721 0.0 0.5000 0.5090 0.5120 0.5190 0.5239 0.5279 0.5279 0.5279 0.5279 0.5279 0.5279 0.5279 0.5279 0.5279 0.5000 <t< th=""><th>0.3156 0.3121</th></t<>	0.3156 0.3121
-0.1 0.4802 0.4562 0.4522 0.4483 0.4443 0.4444 0.4384 0.4326 -0.0 0.5000 0.4590 0.4889 0.4840 0.4891 0.4761 0.4721 0.0 0.5000 0.5404 0.5000 0.5120 0.5160 0.5199 0.5239 0.5279 0.1 0.5398 0.5438 0.4478 0.5517 0.5557 0.5596 0.5556 0.5576 0.2 0.5793 0.5832 0.5871 0.5917 0.5948 0.5897 0.6056 0.6676 0.4 0.5854 0.6554 0.65591 0.6255 0.6239 0.6337 0.5783 0.6772 0.6804 0.4 0.6554 0.65591 0.6855 0.6684 0.6700 0.6738 0.6772 0.6804 0.5 0.6815 0.6851 0.7940 0.7340 0.7723 0.7773 0.7730 0.7772 0.7730 0.7772 0.7730 0.7772 0.7730 0.7754 0.7774 0.7774	0.3520 0.3483
-0.0 0.5000 0.4890 0.4820 0.4840 0.4840 0.4840 0.4761 0.4721 0.0 0.5000 0.5090 0.5120 0.5190 0.5239 0.5279 0.1 0.5398 0.5438 0.5478 0.5517 0.5557 0.5596 0.5506 0.5675 0.2 0.5793 0.5812 0.5871 0.5591 0.5987 0.5910 0.5984 0.5987 0.5910 0.5984 0.5997 0.0520 0.0604 0.3 0.6179 0.5217 0.6282 0.6684 0.6606 0.6736 0.6772 0.6888 0.5 0.6915 0.6590 0.6985 0.6664 0.6700 0.6738 0.7123 0.7738 0.7722 0.6893 0.6 0.7257 0.7291 0.7337 0.7738 0.7723 0.7738 0.7723 0.7742 0.734 0.7734 0.7734 0.7734 0.7734 0.7734 0.7734 0.7734 0.7734 0.7784 0.7734 0.7734 0.7734 <th>0.3897 0.3859</th>	0.3897 0.3859
0.0 0.5090 0.5040 0.5080 0.5120 0.5190 0.5190 0.5229 0.5279 0.1 0.5398 0.5438 0.5471 0.5517 0.5557 0.5596 0.5579 0.2 0.5799 0.8322 0.3871 0.5917 0.5987 0.6026 0.6064 0.3 0.6179 0.8217 0.0255 0.6239 0.6331 0.6388 0.4060 0.6443 0.4 0.6554 0.6591 0.6928 0.6684 0.6700 0.6738 0.6772 0.6808 0.5 0.6915 0.6985 0.7919 0.7524 0.7337 0.7389 0.7422 0.7454 0.7450 0.7323 0.7123 0.7131 0.7153 0.7153 0.7140 0.7450 0.7734 0.7754 0.	0.4286 0.4247 0.4681 0.4641
0.1 0.5398 0.5438 0.4478 0.5517 0.55957 0.5596 0.5506 0.5650 0.2 0.5793 0.5823 0.5871 0.5910 0.5948 0.5967 0.0506 0.6060 0.3 0.6179 0.6217 0.6282 0.6684 0.6700 0.6738 0.6406 0.6443 0.4 0.6554 0.6591 0.6282 0.6684 0.6700 0.6738 0.7672 0.888 0.5 0.6915 0.6950 0.6985 0.7019 0.7054 0.7388 0.7123 0.7139 0.7 0.7880 0.7611 0.7242 0.7373 0.7789 0.7422 0.7244 0.7734 0.8 0.7881 0.7910 0.7099 0.7967 0.7995 0.8023 0.8023 0.8011 0.8783 0.8 0.7881 0.7910 0.7999 0.7967 0.7995 0.8023 0.8031 0.8315 0.8315 0.8315 0.8315 0.8315 0.8315 0.8315 0.8315	0.5319 0.5359
0.2 0.5793 0.5832 0.5871 0.5910 0.5948 0.5987 0.6026 0.6064 0.3 0.6179 0.6271 0.6255 0.6293 0.6331 0.6388 0.6406 0.6443 0.4 0.6554 0.6591 0.6952 0.6694 0.6700 0.6736 0.6772 0.8808 0.5 0.6915 0.6958 0.7019 0.7054 0.7089 0.7123 0.7157 0.6 0.7257 0.7291 0.7324 0.7337 0.7389 0.7422 0.7444 0.7437 0.7734 0.7734 0.7744 0.7737 0.7704 0.7734 0.7744 0.7737 0.7704 0.7734 0.7744 0.7737 0.7704 0.7734 0.7744 0.7733 0.7454 0.7881 0.8781 0.8081 0.8082 0.8081 0.8078 0.8078 0.8021 0.8031 0.8018 0.8078 0.8021 0.8031 0.8018 0.8031 0.8031 0.8031 0.8031 0.8031 0.80312 0.8031	0.5714 0.5753
0.3 0.6179 0.5217 0.6228 0.6684 0.6331 0.6388 0.6406 0.6446 0.4 0.6554 0.6592 0.6684 0.6700 0.6736 0.6772 0.6888 0.5 0.6915 0.6950 0.6928 0.6684 0.7004 0.7088 0.7123 0.7120 0.6 0.7257 0.7289 0.7334 0.7373 0.7739 0.7422 0.7244 0.7244 0.7434 0.7744 0.7784 0.7784 0.8789 0.8315 <th>0.6103 0.6141</th>	0.6103 0.6141
0.4 0.6554 0.6591 0.6528 0.6664 0.6700 0.6736 0.6772 0.6808 0.5 0.6915 0.6959 0.7019 0.7019 0.7038 0.7023 0.7173 0.7173 0.7173 0.7173 0.7173 0.7173 0.7173 0.7174 0.7784	0.6480 0.6517
0.5 0.6915 0.6990 0.6985 0.7019 0.7054 0.7058 0.7123 0.7139 0.6 0.7257 0.7239 0.7334 0.7335 0.7338 0.7422 0.7143 0.7744 0.7744 0.7744 0.7744 0.7744 0.7754 0.7730 0.7704 0.7774 0.7774 0.7774 0.7774 0.7774 0.7774 0.7784 0.7780 0.7794 0.7794 0.7794 0.7794 0.7794 0.7784 0.7780 0.7796 0.7999 0.7807 0.7976 0.7999 0.8023 0.3031 0.3031 0.3031 0.3031 0.3031 0.3031 0.3031 0.3310 0.3848 0.3818 0.3818 0.3818 0.3818 0.3818 0.3818 0.3818 0.3818 0.3859 0.8729 0.8749 0.3770 0.3870 1.1 0.36413 0.3888 0.38907 0.8729 0.8749 0.3870 0.3870 0.3844 0.3816 0.3870 0.3870 0.3844 0.3816 0.3870	0.6844 0.6879
0.7 0.7580 0.7641 0.7642 0.7673 0.7704 0.7774 0.7784 0.7784 0.7784 0.7784 0.7784 0.7784 0.7784 0.7784 0.7784 0.7784 0.7784 0.7784 0.8789 0.8976 0.7995 0.9796 0.7995 0.9276 0.9995 0.8023 0.8023 0.8023 0.8315 0.8348 0.8388 0.83848 0.8288 0.8231 0.8354 0.8377 1.1 0.8494 0.8865 0.8888 0.8307 0.8272 0.8244 0.8269 0.8790 0.8790 1.3 0.9032 0.9049 0.9066 0.9082 0.9099 0.9115 0.9131 0.9147 1.4 0.9192 0.9207 0.9222 0.9223 0.9236 0.9599 0.9115 0.9131 0.9147 1.5 0.8352 0.9345 0.0357 0.3370 0.8382 0.9994 0.9069 0.9151 0.9279 0.9222 1.6 0.4452 0.9445 0.0357 0	0.7190 0.7224
0.8 0.7881 0.7910 0.7997 0.7967 0.7995 0.8023 0.8051 0.8078 0.9 0.8196 0.8126 0.2321 0.2323 0.2324 0.8239 0.3315 0.3331 0.3341 0.8431 0.8431 0.8441 0.8485 0.8508 0.8531 0.3554 0.8577 0.8790 1.1 0.8431 0.8569 0.8386 0.8708 0.8789 0.8731 0.3577 0.8790 1.2 0.8849 0.8869 0.8388 0.8907 0.8925 0.8944 0.3862 0.8931 1.4 0.9192 0.9207 0.9262 0.9999 0.9115 0.9131 0.9141 1.4 0.9192 0.9207 0.9262 0.9999 0.9115 0.9131 0.9141 1.4 0.9192 0.9207 0.9237 0.9370 0.9251 0.9265 0.9279 0.9229 1.5 0.9322 0.9343 0.9433 0.9373 0.9373 0.9959 0.9959 0.9050	0.7517 0.7549
0.9 0.8199 0.8189 0.82142 0.82238 0.82644 0.82889 0.8315 0.8340 1.0 0.8431 0.8438 0.8461 0.84848 0.8509 0.8534 0.8554 0.8577 1.1 0.8494 0.8869 0.8888 0.8907 0.8279 0.8749 0.8770 0.8790 1.2 0.8494 0.8869 0.8888 0.8907 0.8929 0.8944 0.9092 0.9090 0.9115 0.9131 0.9147 1.3 0.9032 0.9049 0.9066 0.9082 0.9099 0.9115 0.9137 0.9477 0.9477 0.9477 0.9477 0.9477 0.9479 0.9227 0.9223 0.9236 0.9599 0.9151 0.9147 0.9441 0.9449 0.9060 0.9522 0.9382 0.9999 0.9016 0.9472 0.9279 0.9292 0.9279 0.9292 0.9279 0.9292 0.9279 0.9292 0.9516 0.9461 0.9473 0.94969 0.9406 0.9473 0.9476	0.7823 0.7852
1.0	0.8106 0.8133
1.1 0.8443 0.8665 0.8788 0.8798 0.8729 0.8729 0.8749 0.8770 0.8794 1.2 0.8494 0.8896 0.8898 0.8997 0.8924 0.8982 0.8982 0.8982 0.8982 0.8982 0.8982 0.8982 0.8982 0.8982 0.8982 0.8999 0.9115 0.9131 0.9147 0.9147 0.9223 0.9223 0.9223 0.9234 0.9269 0.9279 0.9222 0.9234 0.9397 0.9322 0.9324 0.9484 0.9483 0.9397 0.9322 0.9394 0.9406 0.9418 0.9483 0.9493 0.9484 0.9483 0.9494 0.9484 0.9484 0.9495 0.9595 0.9595 0.9595 0.9515 0.9527 0.9781 0.9784 0.9464 0.9473 0.9596 0.95915 0.9527 0.9781 0.9784 0.9461 0.9671 0.9573 0.9582 0.9991 0.9998 0.9908 0.9916 0.9904 0.9916 0.9906 0.9916 0.9906	0.8365 0.8389
1.2 0.8849 0.8869 0.8888 0.8907 0.8825 0.8924 0.3962 0.3998 1.3 0.9022 0.9049 0.90982 0.9099 0.9115 0.9131 0.9141 1.4 0.9192 0.9207 0.9222 0.9236 0.9251 0.9285 0.9279 0.9222 1.5 0.9332 0.9345 0.9377 0.9370 0.9392 0.9394 0.4066 0.4418 1.6 0.9452 0.9463 0.9474 0.9484 0.9499 0.9595 0.9515 0.9525 1.8 0.9641 0.9564 0.9564 0.9664 0.9664 0.9677 0.9688 0.9613 1.9 0.9773 0.9776 0.9732 0.9732 0.9738 0.9793 0.9744 0.9750 0.9573 1.9 0.9773 0.9776 0.9722 0.9732 0.9732 0.9738 0.9793 0.9744 0.9750 0.9668 2.0 0.9772 0.9778 0.9383 0.9383 0	0.8599 0.8621
1.3 0.9032 0.9049 0.0066 0.9982 0.9099 0.9115 0.9131 0.9147 1.4 0.9192 0.9227 0.9223 0.9236 0.9251 0.9229 0.9227 0.9229 0.9229 0.9232 0.9332 0.9344 0.9469 0.9481 0.9493 0.9384 0.9481 0.9493 0.9384 0.9481 0.9493 0.9593 0.9595 0.9595 0.9515 0.9525 1.7 0.9554 0.9594 0.9573 0.9582 0.9591 0.9599 0.9608 0.9616 1.8 0.9641 0.9548 0.9573 0.9582 0.9591 0.9599 0.9608 0.9611 1.9 0.9773 0.9718 0.9573 0.9782 0.9691 0.9674 0.9686 0.9661 0.9673 0.9783 0.9783 0.9783 0.9784 0.9774 0.9776 0.9783 0.9783 0.9783 0.9784 0.9780 0.9893 0.9893 0.9893 0.9893 0.9893 0.9893 0.9893	0.8810 0.8830
1.4 0.9192 0.9207 0.9222 0.9236 0.9251 0.9265 0.9279 0.9292 1.5 0.9322 0.9345 0.0357 0.9337 0.9332 0.9394 0.0466 0.9418 1.6 0.9452 0.9463 0.9474 0.9484 0.9495 0.9555 0.9515 0.9525 1.7 0.9549 0.9564 0.9582 0.9591 0.9599 0.9608 0.9616 1.8 0.9441 0.94649 0.0456 0.9664 0.9671 0.9678 0.9678 0.9686 0.9681 1.9 0.9773 0.9778 0.9732 0.9732 0.9732 0.9736 0.9770 0.9770 0.9750 0.9803 0.9803 0.9803 0.9803 0	0.8997 0.9015
1.5 0.9332 0.9345 0.9370 0.9370 0.9382 0.9384 0.9406 0.9418 1.6 0.9452 0.9463 0.9474 0.9484 0.9495 0.9505 0.9515 0.9525 1.7 0.9554 0.9564 0.9573 0.9582 0.9591 0.9599 0.9508 0.9616 1.8 0.9641 0.9647 0.9486 0.9667 0.9686 0.9661 0.9661 0.9673 0.9788 0.9743 0.9784 0.9738 0.9744 0.9478 0.9783 0.9788 0.9793 0.9744 0.9478 0.9783 0.9788 0.9793 0.9844 0.9484 0.9496 0.9672 0.9783 0.9788 0.9793 0.9784 0.9486 0.9667 0.9632 0.9833 0.9844 0.9484 0.9496 0.9846 0.9857 0.9833 0.9844 0.9846 0.9857 0.9868 0.9969 0.9971 0.9972 0.9972 0.9971 0.9972 0.9971 0.9961 0.9961 0.9961 0.9961 <th>0.9162 0.9177</th>	0.9162 0.9177
1.6 0.9452 0.9463 0.9474 0.9484 0.9495 0.9555 0.9515 0.9525 1.7 0.9594 0.9594 0.9598 0.9591 0.9599 0.9608 0.9616 1.8 0.9441 0.9649 0.9566 0.9664 0.9671 0.9678 0.9686 0.9691 1.9 0.9713 0.9778 0.9732 0.9732 0.9738 0.9740 0.9750 0.9752 0.9732 0.9738 0.9793 0.9788 0.9793 0.9788 0.9893 0.9842 0.9830 0.9834 0.9838 0.9842 0.9836 0.9842 0.9884 0.9871 0.9875 0.9878 0.9878 0.9878 0.9878 0.9878 0.9878 0.9878 0.9881 0.9842 0.9884 0.9884 0.9871 0.9875 0.9878 0.9881 0.9884 0.9884 0.9871 0.9872 0.9992 0.9991 0.9991 0.9991 0.9991 0.9991 0.9991 0.9991 0.9991 0.9991 0.9991 0.9991 <th>0.9306 0.9319 0.9429 0.9441</th>	0.9306 0.9319 0.9429 0.9441
1.7 0.9554 0.9564 0.9573 0.9582 0.9591 0.9599 0.9608 0.9616 1.8 0.9641 0.9674 0.9666 0.9661 0.9671 0.9678 0.9681 0.9691 1.9 0.9713 0.9719 0.9776 0.9732 0.9738 0.9744 0.3730 0.9782 2.1 0.9821 0.9826 0.8330 0.9883 0.9973 0.9783 0.9893 0.9803 0.9882 2.2 0.9821 0.9824 0.3830 0.9881 0.8973 0.9878 0.9873 0.9884 0.9884 0.9871 0.8675 0.9873 0.9881 0.9894 0.9884 0.98871 0.8975 0.9978 0.9990 0.9991 0.9904 0.9904 0.9909 0.9991 0.9914 0.9945 0.9963 0.9987 0.9927 0.9928 0.9991 0.9941 0.9944 0.9945 0.9948 0.9969 0.9911 0.9946 0.9948 0.9969 0.9991 0.9946 0.9948 0.9969	0.9535 0.9545
1.8 0.9641 0.9649 0.9656 0.9664 0.9671 0.9678 0.9688 0.9693 1.9 0.9713 0.9779 0.9773 0.9773 0.9773 0.9773 0.9773 0.9732 0.9783 0.9783 0.9783 0.9783 0.9788 0.9793 0.9788 0.9803 0.9803 0.9834 0.9833 0.9834 0.9834 0.9834 0.9834 0.9834 0.9842 0.9846 0.9850 2.2 0.9891 0.9894 0.9888 0.9871 0.9875 0.9878 0.9891 0.9894 0.9894 0.9894 0.9894 0.9894 0.9894 0.9994 0.	0.9625 0.9633
1.9 0.9713 0.9719 0.9726 0.9732 0.9738 0.9734 0.9734 0.9734 0.9734 0.9739 0.9788 0.9793 0.9783 0.9793 0.9783 0.9793 0.9783 0.9839 0.9830 0.9832 2.1 0.9821 0.9826 0.9830 0.9834 0.9838 0.9842 0.9846 0.9850 2.2 0.9861 0.9884 0.9884 0.9879 0.9878 0.9884 0.9884 2.3 0.8983 0.9896 0.9891 0.9901 0.9901 0.9901 0.9901 0.9903 0.9909 0.9911 2.4 0.9918 0.9920 0.9922 0.9922 0.9927 0.9923 0.9941 0.9944 0.9945 0.9946 0.9963 0.9968 0.9969 0.9961 0.9962 0.9962 0.9961 0.9961 0.9962 0.9962 0.9963 0.9966 0.9965 0.9965 0.9965 0.9965 0.9966 0.9967 0.9968 0.9966 0.9967 0.9968	0.9699 0.9706
2.0 0.9772 0.9778 0.9783 0.9788 0.9793 0.9788 0.8903 0.9803 0.9834 0.9833 0.9834 0.9833 0.9844 0.9838 0.9841 0.9838 0.9842 0.9838 0.9847 0.9878 0.9878 0.9881 0.9824 2.3 0.9893 0.9896 0.9991	0.9761 0.9767
2.1 0.9821 0.9826 0.9830 0.9833 0.9842 0.9846 0.9850 2.2 0.9861 0.9886 0.9871 0.9875 0.9878 0.9881 0.9891 2.3 0.9893 0.9896 0.9898 0.9901 0.9904 0.9906 0.9909 0.9911 2.4 0.9918 0.9920 0.9922 0.9922 0.9923 0.9931 0.9942 0.9943 0.9944 0.9946 0.9948 0.9948 2.5 0.9938 0.9940 0.9943 0.9944 0.9946 0.9948 0.9948 2.6 0.9953 0.9945 0.9967 0.9959 0.9960 0.9961 0.9962 2.7 0.9965 0.9967 0.9968 0.9969 0.9971 0.9971 0.9972	0.9812 0.9817
2.2 0.9861 0.9864 0.9888 0.9871 0.9875 0.9878 0.9881 0.9882 2.3 0.9893 0.9890 0.9991 0.9990 0.9991 0.9990 0.9991 0.9991 0.9992 0.9909 0.9911 2.4 0.9918 0.9920 0.9922 0.9927 0.9922 0.9923 0.9931 0.9941 0.9944 0.9944 0.9945 0.9948 0.9949 2.6 0.9953 0.9955 0.9966 0.9957 0.9959 0.9960 0.9961 0.9962 2.7 0.9965 0.9967 0.9968 0.9969 0.9971 0.9972	0.9854 0.9857
2.3 0.9893 0.9896 0.9898 0.9901 0.9904 0.9906 0.9909 0.9911 2.4 0.9918 0.9920 0.9922 0.9927 0.9927 0.9929 0.9927 2.5 0.9938 0.9940 0.9941 0.9943 0.9945 0.9946 0.9948 0.9948 2.6 0.9953 0.9955 0.9956 0.9956 0.9956 0.9960 0.9961 0.9961 2.7 0.9965 0.9966 0.9968 0.9960 0.9971 0.9972	0.9887 0.9890
2.5 0.9938 0.9940 0.9941 0.9943 0.9945 0.9946 0.9948 0.9949 2.6 0.9953 0.9955 0.9956 0.9957 0.9959 0.9960 0.9961 0.9962 2.7 0.9965 0.9966 0.99967 0.9988 0.9969 0.9970 0.9971 0.9972	0.9913 0.9916
2.6 0.9953 0.9955 0.9956 0.9957 0.9959 0.9960 0.9961 0.9962 2.7 0.9965 0.9966 0.9967 0.9968 0.9969 0.9970 0.9971 0.9972	0.9934 0.9936
2.7 0.9965 0.9966 0.9967 0.9968 0.9969 0.9970 0.9971 0.9972	0.9951 0.9952
	0.9963 0.9964
2.8 0.9974 0.9975 0.9976 0.9977 0.9977 0.9978 0.9979 0.9979	0.9973 0.9974
	0.9980 0.9981
2.9 0.9981 0.9982 0.9983 0.9984 0.9984 0.9985 0.9985	0.9986 0.9986
3.0 0.9987 0.9987 0.9988 0.9988 0.9989 0.9989 0.9989	0.9990 0.9990
3.1 0.9990 0.9991 0.9991 0.9991 0.9992 0.9992 0.9992 0.9992	0.9993 0.9993
3.2 0.9993 0.9993 0.9994 0.9994 0.9994 0.9994 0.9995	0.9995 0.9995
3.3 0.9995 0.9995 0.9995 0.9996 0.9996 0.9996 0.9996 0.9996 0.9996 3.4 0.9997 0	0.9996 0.9997 0.9997 0.9998

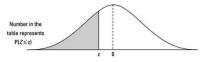
Voltando a questão

Média=60; desvio padrão=15; se eu tirei 80...



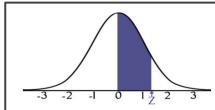
Diferentes tabelas de z-score

-0.5	.1041	.1014	.1700	.1702	.1730	.1711	.1000	.1000	.1050	.1011
-0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
-0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
-0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
-0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
-0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
-0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
-0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
-0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
-0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641



z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.6	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
-3.5	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
-3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
-3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
-3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
-3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
-3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
-2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
-2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
-2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
-2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
-2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
-2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
-2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
-2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
-2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
-2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
-1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
-1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
-1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
-1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
-1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
-1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
-1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
-1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
-1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
-1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
-0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
	F000	****	4000	1000	****	****		4704	****	

Diferentes tabelas de z-score



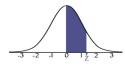
STANDARD NORMAL TABLE (Z)

Entries in the table give the area under the curve between the mean and z standard deviations above the mean. For example, for z = 1.25 the area under the curve between the mean (0) and z is 0.3944.

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0190	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141

. . .

_											
ш	2.1	0.4903	0.4900	0.4907	0.4900	0.4909	0.4970	0.4971	0.4372	0.4373	0.4374
П	2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
ı	2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
ı	3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
ı	3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4992	0.4992	0.4993	0.4993
ı	3.2	0.4993	0.4993	0.4994	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
l	3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
l	3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998



STANDARD NORMAL TABLE (Z)

Entries in the table give the area under the curve between the mean and z standard deviations above the mean. For example, for z = 1.25 the area under the curve between the mean (0) and z is 0.3944.

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0190	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2969	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3513	0.3554	0.3577	0.3529	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927 0.4945	0.4929	0.4931 0.4948	0.4932	0.4934	0.4936 0.4952
2.6	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.7	0.4955	0.4955	0.4956	0.4957	0.4959	0.4970	0.4961	0.4902	0.4963	0.4964
2.8	0.4903	0.4975	0.4907	0.4908	0.4909	0.4978	0.4979	0.4979	0.4973	0.4974
2.9	0.4974	0.4973	0.4976	0.4977	0.4977	0.4976	0.4979	0.4979	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3.1	0.4990	0.4991	0.4991	0.4991	0.4992	0.4992	0.4999	0.4992	0.4993	0.4993
3.2	0.4990	0.4993	0.4991	0.4994	0.4994	0.4994	0.4994	0.4995	0.4995	0.4995
3.3	0.4995	0.4995	0.4995	0.4996	0.4996	0.4996	0.4996	0.4996	0.4996	0.4997
3.4	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4997	0.4998
0.4	J.400/	J.435/	J.433/	J.455/	J.400/	J.455/	J.455/	J.#35/	J.400/	V.4000