prob_probs3

September 11, 2024

[56]:
```
#3.4
import numpy as np
from scipy.stats import norm, binom

warr = 50_000
kmean = 61_000
kstd = 9_000

dist = norm(kmean, kstd)

ltail = dist.cdf(warr)
print(f"a: {ltail*100}")

fail_at_warr = dist.pdf(warr)
print(f"b: {fail_at_warr*100:.6f}")

rangeC = dist.cdf(57000) - dist.cdf(42000)
print(f"c: {rangeC*100}")

miles = dist.ppf(0.80)
print(f"d: {miles:.2f}")
```

```
a: 11.081180122969675
b: 0.002100
c: 31.097926197077104
d: 68574.59
```

[57]:
```
#3.8

xmean = 0.07
xstd = 0.02

ymean = 0.13
ystd = 0.08

corrxy = -0.4
covxy = corrxy * xstd * ystd
```

```
profx = 0.3
profy = 0.7

profmean = (profx * xmean) + (profy * ymean)
profvar = (profx**2 * xstd**2) + (profy**2 * ystd**2) + (2 * profx * profy *␣
 ↪xstd * ystd * corrxy)
profstd = np.sqrt(profvar)

print(f"a: {profmean*100:.4f}")
print(f"b: {profstd*100:.4f}")

profdist = norm(profmean, profstd)
rangeD = profdist.cdf(0.15) - profdist.cdf(0.10)
print(f"d: {rangeD*100}")

1 - (profdist.cdf(profmean - profstd) * 2)
```

```
a: 11.2000
b: 5.3881
d: 34.77936872779806
```

[57]:
```
0.6826894921370859
```

[58]:
```
#3.18
pop = 43000
success_prob = 0.30
sample = 2000
success_obs = 5

test = binom.cdf(success_obs, sample, success_prob)

print(test)

from scipy.stats import binomtest

test2 = binomtest(success_obs, sample, success_prob)
print(test2)
```

```
6.060865399571416e-298
BinomTestResult(k=5, n=2000, alternative='two-sided', statistic=0.0025,
pvalue=9.385763177154244e-298)
```

[ ]:
```
#ChatGPT Link: https://chatgpt.com/share/e/f3fec7db-76cc-4dd9-959c-2883e60b3758
```