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In Class Probability 3

10/11/2022

- **Q1 (1 pt.): If I wanted to use a binomial distribution to model my six forest plots, what values should I use for the two parameters of a binomial distribution?**
    - You would need n, or number of trials, and P which is probability of success for each trial.
- **Q2 (1 pt.): Use `dbinom` to calculate the probability of observing birds in *exactly* four of the six patches. Include your R-code in your answer.**
    - dbinom(x=4, size = 6, prob = 2/3, log = FALSE)
    - 0.3290219
- **Q3 (1 pt.): Now, suppose I did a survey and observed no birds in my plots. Use `dbinom` to calculate the probability of observing no presences.**
    - dbinom(x=0, size=7, prob=2/3, log=FALSE)
    - 0.0004572474
- **Q4 (1 pt.): Back to the binomial scenario (bird presence/absence in 6 forest plots).**
    - **Now use `pbinom` to calculate the probability of observing *four or fewer* presences in the 6 plots. Show your R code?**
    - 0.648834
    - pbinom(q = 4, size = 6, prob = 2/3, lower.tail = TRUE, log.p = FALSE)
- **Q5 (1 pt.): Now use `pbinom` and the law of total probability to calculate the probability of observing *four or more* presences in the 6 plots. Show your R code?**
    - pbinom(q = 4, size = 6, prob = 2/3, lower.tail = FALSE, log.p = FALSE)
    - 0.351166
- **Q6 (1 pt.): Are you more *likely* to observe a value of 1.0 or 2.0?**
    - You are more likely to observe a value of 1.0.
- **Q7 (1 pt.): What is the *probability* of observing a value of 1.0 or less? Show the R code you used to find your answer.**
    - 0.8413447
    - pnorm(q=1,mean=0,sd=1, lower.tail=TRUE, log.p=FALSE)
- **Q8 (1 pt.): What is the *probability* of observing a value between 1.0 and 2.0? Show the R code you used to find your answer.**
    - pnorm(q=1:2,mean=0,sd=1, lower.tail=TRUE, log.p=FALSE)
    - 0. 1359052
- **Q9 (2 pts.): Show the complete R-code you used to create your plot. Make sure you include all the code to recreate your plot in a fresh R session.**

  y_2 = dnorm(x, mean = 0, sd = 2)

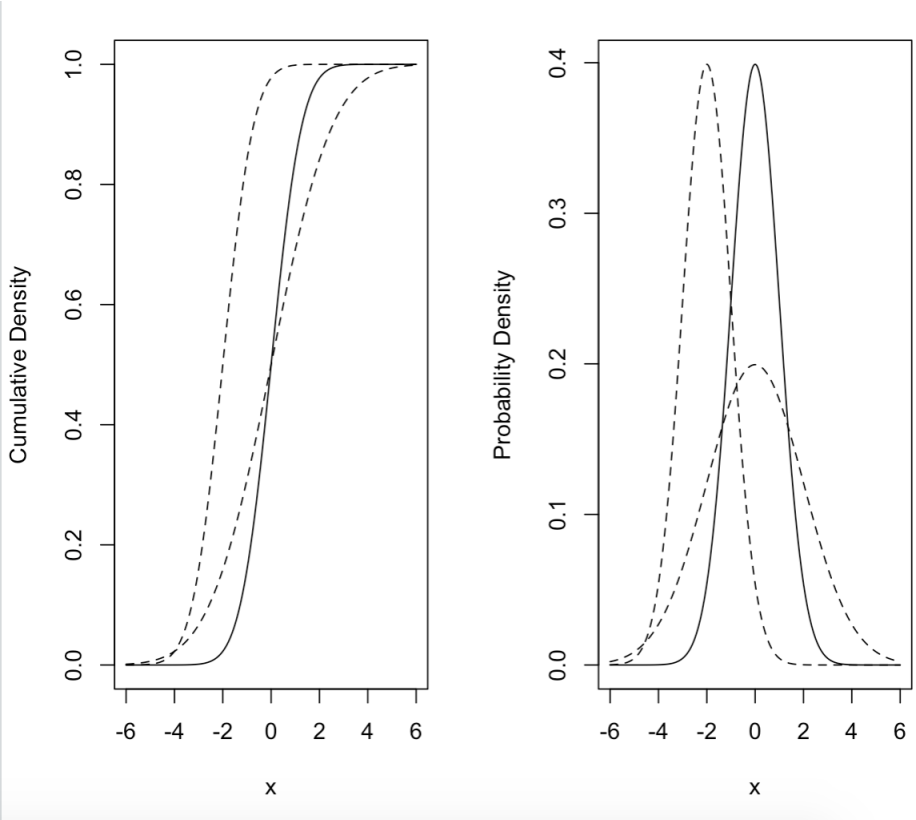
  y2 = dnorm(x, mean = -2, sd= 1)

```
plot(y ~ x, type = "l", ylab = "Probability Density")
points(y_2 ~ x, type = "l", lty  = 2)
points(y2 ~ x, type = "l", ylab = "Probability Density", lty  = 2)

y_cdf_1 = pnorm(x, mean = 0, sd = 1)
plot(y_cdf_1 ~ x, type = "l", ylab = "cumulative density")
y_cdf3 = pnorm(x, mean= -2, sd=1)

y_cdf_2 = pnorm(x, mean = 0, sd = 2)
plot(y_cdf_1 ~ x, type = "l", ylab = "Cumulative Density")
points(y_cdf3 ~ x, type = "l", lty = 2)
plot()
```

- **Q10 (1 pt.): Include a figure of your plot.**



- **Q11 (2 pts.): Show the complete R-code you used to create your plot. Make sure you include all the code to recreate your plot in a fresh R session.**

```
x_bin = 0:5

y_bin_2 = dbinom(x_bin, size = 6, prob = 2/3)


barplot(
  height = y_bin_2,
  names.arg = x_bin,
  space = 0,
  ylab = "Pr(x)",
  main = "Binomial: n = 6, p = 2/3")
```

- **Q12 (1 pt.)**: **Include a figure of your plot.**