**Section 1: Probability Distribution:**

1. **It is known that 16% of integrated circuit chips on a production line are defective. To maintain and monitor the quality of the chips, a sample of twenty-five chips is selected at regular intervals for inspection.** 
   * 1. District distribution as the answer there can only be defective and not defective.
     2. Display the probability distribution function on a graph (X is f(k) = P(X = k)) :

Chart, histogram

Description automatically generated

* + 1. Display the cumulative density function on a graph.

Chart

Description automatically generated

* + 1. What is the probability of getting 10 defective chips in a batch of this size? dbinom(10,25,0.16) = [1] 0.002628888
    2. What is the probability of getting 2 or less defective chips a batch of this size? pbinom(1,25,0.16) = [1] 0.0737137
    3. How many defectives on average do we get in samples of this size 25. 3.9975
    4. What is the probability of getting between 2 and 5 (inclusive) defective chips in a batch of this size?

> pbinom(5,25,0.16) - pbinom(1,25,0.16) = 0.7260403

1. Part 2 is through Data Camp, 1 Chapter ONLY from the Foundations of Probability in R course:

Graphical user interface, text, application

Description automatically generated

**There was a bug where it wasn’t taking 0.3 and I had to get the answer to get pass the calculating density of a binomial.**

1. **Section 2: Hypothesis Testing:**
2. Suppose it is up to you to determine if a certain county receives significantly more school funding (per student) than the Irish average. You know that Ireland mean school yearly funding is €4950 per student per year, with a standard deviation of €630. You have sample data from 40 schools in Cork, where the sample mean for Cork (per student per year) is €5075. What is your null hypothesis and alternative hypothesis, test this hypothesis and interpret your results? Find a 95% Confidence Interval for the mean funding for a Cork Student, interpret this.

Null hypothesis: The mean funding per student in cork is significantly more than the Irish average:

H0: µ = €5075

• Alternative hypothesis: the mean funding of student in cork is

not the same as the Irish average fund:

H1: µ ¹ €5075

• µ = the population mean of the funding received per student

The hypothesis is rejected as H0 fall in the rejection region

1. Reload the Melanoma dataset from MASS package In previous Assignments.

The mean age of individuals who get melanoma is believed to 65 years old in the world. You want to test to see if there mean age for Melanoma dataset for patients from Denmark is the same as what is expected in the world.

Make sure in your answer to explain the hypotheses, any assumptions needed and if they are met, results and interpretation of all the results. Conclude your findings.