

1. Aufgabe $n = 20$

$$H_1: p = 0,25 \quad A_1 = \{9; 10; \dots; 50\}$$

$$H_2: p = 0,1 \quad A_2 = \{0; 1; \dots; 8\}$$

$$a) \underline{P_{0,25}^{50}(Z \leq 8)} = \sum_{i=0}^8 B(50; 0,25; i) = \underline{9,16\%}$$

$$b) \underline{P_{0,1}^{50}(Z \geq 9)} = 1 - P_{0,1}^{50}(Z \leq 8) = 1 - \sum_{i=0}^8 B(50; 0,1; i) = 1 - 0,94213 = \underline{5,787\%}$$

2. Aufgabe $n = 100$

$$H_1: p = 0,05 \quad A_1 = \{0; 1; \dots; 7\}$$

$$H_2: p = 0,1 \quad A_2 = \{8; 9; \dots; 100\}$$

$$a) \underline{P_{0,05}^{100}(Z \geq 8)} = 1 - P_{0,05}^{100}(Z \leq 7) = 1 - \sum_{i=0}^7 B(100; 0,05; i) = 1 - 0,87204 = \underline{12,796\%}$$

$$b) \underline{P_{0,1}^{100}(Z \leq 7)} = \sum_{i=0}^7 B(100; 0,1; i) = \underline{20,605\%}$$

3. Aufgabe $n = 200$

$$H_1: p = 0,25 \quad A_1 = \{41; 42; \dots; 200\}$$

$$H_2: p = 0,2 \quad A_2 = \{0; 1; \dots; 40\}$$

$$a) \underline{P_{0,25}^{200}(Z \leq 40)} = \sum_{i=0}^{40} B(200; 0,25; i) = \underline{20,6\%}$$

$$b) \underline{P_{0,2}^{200}(Z \geq 41)} = 1 - P_{0,2}^{200}(Z \leq 40) = 1 - \sum_{i=0}^{40} B(200; 0,2; i) = 1 - 0,67693 = \underline{22,3\%}$$

4. Aufgabe

$$a) p = 0,5 \cdot 0,25 + 0,25 \cdot 0,5 = \underline{0,25}$$

$$n = 100$$

$$H_1: p = 0,25 \quad A_1 = \{20; 21; \dots; 30\}$$

$$H_2: p = 0,1 \quad A_2 = \{0; 1; \dots; 19\} \cup \{31; 32; \dots; 100\}$$

$$b) \underline{P_{0,25}^{100}(Z \leq 19) + P_{0,25}^{100}(Z \geq 31)} = P_{0,25}^{100}(Z \leq 19) + 1 - P_{0,25}^{100}(Z \leq 30) =$$

$$= \sum_{i=0}^{19} B(100; 0,25; i) + 1 - \sum_{i=0}^{30} B(100; 0,25; i) = 0,09953 + 1 - 0,89621 = \underline{20,332\%}$$

$$c) \underline{P_{0,1}^{100}(20 \leq Z \leq 30)} = P_{0,1}^{100}(Z \leq 30) - P_{0,1}^{100}(Z \leq 19) =$$

$$= \sum_{i=0}^{30} B(100; 0,1; i) - \sum_{i=0}^{19} B(100; 0,1; i) = 1 - 0,99802 = \underline{0,198\%}$$