Source Code======================================================================

import scipy.stats as ss

import numpy as np

pdf = []

def HW4\_3(pieces, defect\_p):

for i in range(pieces + 1):

pdf.append(ss.binom.pmf(i, pieces, defect\_p))

print(i, "defects: ", pdf[i]\*100, "%")

print("Highest probability: ", np.argmax(pdf), "defects with probability of", max(pdf)\*100, "%")

pieces = 400

defect\_rate = .03

HW4\_3(pieces, defect\_rate)

Output==========================================================================

0 defects: 0.000511321090529 %

1 defects: 0.0063256217385 %

2 defects: 0.0390297382525 %

3 defects: 0.160142637366 %

4 defects: 0.491571858512 %

5 defects: 1.2040976658 %

6 defects: 2.45164215459 %

7 defects: 4.26780710858 %

8 defects: 6.4842069343 %

9 defects: 8.73473923796 %

10 defects: 10.5627310579 %

11 defects: 11.5823761365 %

12 defects: 11.6122276214 %

13 defects: 10.7189793429 %

14 defects: 9.16401694924 %

15 defects: 7.29342379878 %

16 defects: 5.42777351004 %

17 defects: 3.79187088148 %

18 defects: 2.49533771067 %

19 defects: 1.55163158786 %

20 defects: 0.914182940682 %

21 defects: 0.511619318791 %

22 defects: 0.272591923836 %

23 defects: 0.138556361107 %

24 defects: 0.0673141084244 %

25 defects: 0.0313114698156 %

26 defects: 0.0139672496203 %

27 defects: 0.00598367853151 %

28 defects: 0.00246529317996 %

29 defects: 0.000978054457458 %

30 defects: 0.000374080622389 %

31 defects: 0.000138087625824 %

32 defects: 4.92471010911e-05 %

33 defects: 1.6984942082e-05 %

34 defects: 5.67023081635e-06 %

35 defects: 1.83384784576e-06 %

36 defects: 5.75046790122e-07 %

37 defects: 1.74965476404e-07 %

38 defects: 5.16921876841e-08 %

39 defects: 1.48394702154e-08 %

40 defects: 4.14204800085e-09 %

41 defects: 1.12482067913e-09 %

42 defects: 2.97356865839e-10 %

43 defects: 7.65670759796e-11 %

44 defects: 1.92135282039e-11 %

45 defects: 4.70104195229e-12 %

46 defects: 1.12205506033e-12 %

47 defects: 2.61378037743e-13 %

48 defects: 5.94500304918e-14 %

49 defects: 1.32083383546e-14 %

50 defects: 2.86770727575e-15 %

51 defects: 6.08670434513e-16 %

52 defects: 1.26343763865e-16 %

53 defects: 2.56570491101e-17 %

54 defects: 5.09908135235e-18 %

55 defects: 9.92098677365e-19 %

56 defects: 1.8903205653e-19 %

57 defects: 3.52832487501e-20 %

58 defects: 6.45333504512e-21 %

59 defects: 1.15693198607e-21 %

60 defects: 2.03357632603e-22 %

61 defects: 3.5055735213e-23 %

62 defects: 5.92811485062e-24 %

63 defects: 9.83653814193e-25 %

64 defects: 1.60192333465e-25 %

65 defects: 2.56104476023e-26 %

66 defects: 4.02038422998e-27 %

67 defects: 6.19853054075e-28 %

68 defects: 9.38801093119e-29 %

69 defects: 1.39705048371e-29 %

70 defects: 2.04310917573e-30 %

71 defects: 2.93695089876e-31 %

72 defects: 4.15058782514e-32 %

73 defects: 5.76779892661e-33 %

74 defects: 7.88271210227e-34 %

75 defects: 1.05969655478e-34 %

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77 defects: 1.82391509243e-36 %

78 defects: 2.33594200973e-37 %

79 defects: 2.94469526478e-38 %

80 defects: 3.65430610822e-39 %

81 defects: 4.46497882639e-40 %

82 defects: 5.37212061461e-41 %

83 defects: 6.36567266965e-42 %

84 defects: 7.42974313799e-43 %

85 defects: 8.54262764683e-44 %

86 defects: 9.67727538511e-45 %

87 defects: 1.08022199464e-45 %

88 defects: 1.18829481369e-46 %

89 defects: 1.28836319427e-47 %

90 defects: 1.37691049285e-48 %

91 defects: 1.45069305353e-49 %

92 defects: 1.50693910872e-50 %

93 defects: 1.54352259889e-51 %

94 defects: 1.55909663695e-52 %

95 defects: 1.55317494598e-53 %

96 defects: 1.52615450556e-54 %

97 defects: 1.47927825387e-55 %

98 defects: 1.41454232355e-56 %

99 defects: 1.33455726871e-57 %

100 defects: 1.24237650891e-58 %

101 defects: 1.1413073982e-59 %

102 defects: 1.03472077642e-60 %

103 defects: 9.25873660412e-62 %

104 defects: 8.17757168345e-63 %

105 defects: 7.12978267541e-64 %

106 defects: 6.13679991027e-65 %

107 defects: 5.21500869145e-66 %

108 defects: 4.37570889632e-67 %

109 defects: 3.62538635503e-68 %

110 defects: 2.96622519957e-69 %

111 defects: 2.39678269121e-70 %

112 defects: 1.91274907334e-71 %

113 defects: 1.5077230174e-72 %

114 defects: 1.1739460282e-73 %

115 defects: 9.02954452884e-75 %

116 defects: 6.86123406697e-76 %

117 defects: 5.1509132303e-77 %

118 defects: 3.82065816226e-78 %

119 defects: 2.80020515054e-79 %

120 defects: 2.02798362707e-80 %

121 defects: 1.45139835285e-81 %

122 defects: 1.0265509729e-82 %

123 defects: 7.17579005449e-84 %

124 defects: 4.95766672371e-85 %

125 defects: 3.38552416267e-86 %

126 defects: 2.28527036017e-87 %

127 defects: 1.52487396384e-88 %

128 defects: 1.00585677866e-89 %

129 defects: 6.5594112634e-91 %

130 defects: 4.22902565991e-92 %

131 defects: 2.69576673056e-93 %

132 defects: 1.69906572287e-94 %

133 defects: 1.05887050708e-95 %

134 defects: 6.52527524368e-97 %

135 defects: 3.97645639134e-98 %

136 defects: 2.39636357725e-99 %

137 defects: 1.42818869229e-100 %

138 defects: 8.41805526832e-102 %

139 defects: 4.90735848172e-103 %

140 defects: 2.82950050897e-104 %

141 defects: 1.61366556774e-105 %

142 defects: 9.10278892213e-107 %

143 defects: 5.07934440612e-108 %

144 defects: 2.80367592864e-109 %

145 defects: 1.53090871894e-110 %

146 defects: 8.2696311961e-112 %

147 defects: 4.41928534359e-113 %

148 defects: 2.33647086639e-114 %

149 defects: 1.2221490175e-115 %

150 defects: 6.32493615241e-117 %

151 defects: 3.238685133e-118 %

152 defects: 1.64086936676e-119 %

153 defects: 8.22590666983e-121 %

154 defects: 4.08046381199e-122 %

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156 defects: 9.72866987135e-125 %

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158 defects: 2.22429234883e-127 %

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160 defects: 4.87760031925e-130 %

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162 defects: 1.02606176264e-132 %

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164 defects: 2.07093465169e-135 %

165 defects: 9.16102301402e-137 %

166 defects: 4.01100560482e-138 %

167 defects: 1.73820972565e-139 %

168 defects: 7.45587014133e-141 %

169 defects: 3.16554969705e-142 %

170 defects: 1.33033713769e-143 %

171 defects: 5.53404850188e-145 %

172 defects: 2.278764877e-146 %

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175 defects: 1.49686909408e-150 %

176 defects: 5.91838471478e-152 %

177 defects: 2.31647418506e-153 %

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Highest probability: 12 defects with probability of 11.6122276214 %