1. We’ve collected data on the percentage of the population of each county in California that is considered obese, using clinical measures, and that has been diagnosed with diabetes. We have constructed two random variables, Obesity and Diabetes, of the following forms (note: how the categories are constructed is irrelevant),

|  |  |
| --- | --- |
|  | 1 if percent obese is <18.6 |
| Obesity = | 2 if percent obese is 18.6 – 23.5 |
|  | 3 if percent obese is >23.5 |

|  |  |
| --- | --- |
|  | 1 if percent with diabetes is <6.4 |
| Diabetes = | 2 if percent with diabetes is 6.4 – 7.6 |
|  | 3 if percent with diabetes is >7.6 |

The following table reflects the joint probability function of our two variables:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Obesity = 1 | Obesity = 2 | Obesity = 3 | fD(d) |
| Diabetes = 1 | .017 | 0.00 | .034 |  |
| Diabetes = 2 | .0165 | .278 | .189 |  |
| Diabetes = 3 | .0165 | .122 | .327 |  |
| FO(o) |  |  |  | 1.000 |

1. What is the probability that Obesity = 2?
2. Calculate the conditional distribution of Diabetes given that Obesity = 3 (i.e. fill in the table below).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Diabetes = 1 | Diabetes = 2 | Diabetes = 3 | Total |
| Pr(Diabetes|Obesity = 3) |  |  |  |  |

1. Calculate E[Diabetes | Obesity=3].