

# IS606 Homework 2

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## 2.6 Dice rolls (p116)

If you roll a pair of fair dice, what is the probability of:

Assuming:

- Six sided dice
- Values 1 - 6 (no zero)

**a. getting a sum of 1?** The minimum sum from a pair of dice, given the assumptions above, would be 2. Since a sum of 1 is not part of the set of outcomes, the probability would be 0.

**b. getting a sum of 5?** How many ways can a sum of 5 be the result of 2 dice?

Roll	1	2	3	4
die 1	1	2	3	4
die 2	4	3	2	1

There are 4 outcomes which can result in a sum of 5, and 36 total outcomes possible (6 X 6), therefore the probability is  $\frac{4}{36} = \frac{1}{9} \approx 0.1111111$

**c. getting a sum of 12?** There is only one outcome from 2 dice which sum to 12: a 6 and 6 (boxcars). As such, the probability is:

$$\frac{1}{36} \approx 0.0277778$$

## 2.8 Poverty and language (p117)

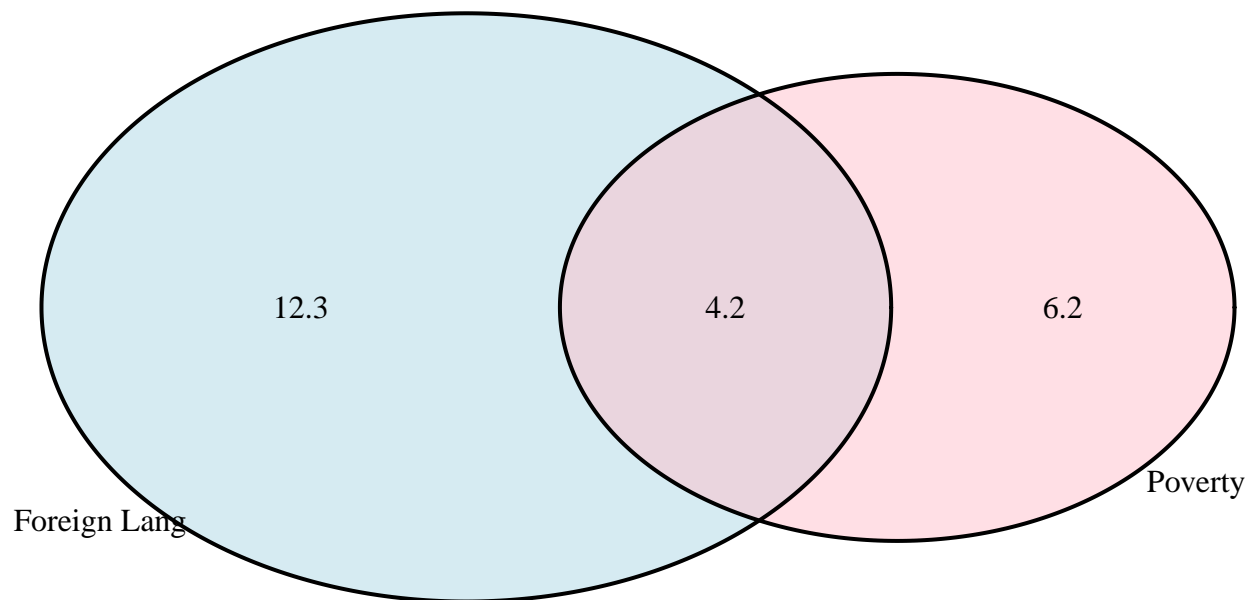
**a. Are living below the poverty line and speaking a foreign language at home disjoint?** No. Specifically, one could be living below the poverty line and speaking a foreign language at home, or one could living below the poverty line only, or speaking a foreign language at home only. In the case described in the question, 4.2% fall into both categories.

```
library(VennDiagram)
```

**b. Draw a venn diagram summarizing the variables and their associated probabilities.**

```
## Loading required package: grid
```

```
draw.pairwise.venn(14.6-4.2,
                   20.7-4.2,
                   cross.area=4.2,
                   c("Poverty", "Foreign Lang"), fill=c("pink", "lightblue"))
```



```
## (polygon[GRID.polygon.1], polygon[GRID.polygon.2], polygon[GRID.polygon.3], polygon[GRID.polygon.4],
```

2.20 ??? (p??)

2.30 ??? (p??)

2.38 ??? (p??)

2.44 ??? (p??)