ORCA 2500, HW 6.

1. The first table below shows the number of women (per 1000) between 15 and 44 years of age who have been married grouped by the number of children they have had. The second table below gives the same information for women who have never been married.

| Number of Children | Women |
|---|---|
| 0 | 162 |
| 1 | 190 |
| 2 | 290 |
| 3 | 289 |
| 4 | 48 |
| 5 | 21 |

Table 1: Number of children for women who have been married

| Number of Children | Women |
|---|---|
| 0 | 791 |
| 1 | 108 |
| 2 | 53 |
| 3 | 29 |
| 4 | 12 |
| 5 | 7 |

Table 2: Number of children for women who have never been married

For each data set, compute the mean, median and standard deviation.

2. In this problem, we want to search texts for words in patterns, similar to what was done in the Bible Code.

   (a) Pick a well known text. You can get it from the gutenberg.org or from some other destination. If you pick a long novel, you may want to work with only one chapter, that is fine. Remove all vowels and punctation, so that you have only a list of the consonants in the text.

   (b) Take the text and place the letters in an $n$ by $m$ grid, for values of $n$ and $m$ that you choose. If you have a last row with fewer than $m$ entries, you can delete that row.

   (c) Pick two words that are related to each other. Search the grid for these two words in an intersecting pattern. Intersect means that if you look at the grid, each word appears in a line, one horizontal and one vertical and the two words share a letter. Remember that the words are only defined by their consonants. You don't include any vowels.

   (d) Search the grid for two intersecting words that are related to each other (this part is optional).

   Describe, in words, and code, exactly what you did. Discuss how likely it was that you found words in part c or d. If you don't do part d, discuss how likely it would have been.

3. We can generalize the Monte Hall problem to have 10 doors with $g$ goats and $c = 10 - g$ cars. First you choose a door. Monte Hall then shows you one with a goat, and then you have a choice to switch to a different curtain or not. The game then ends, and you win if you have now chosen the car. For each value of $g$ from $2, \ldots 9$, compute the probability that you win if you switch, and the probability that you win if you don't switch. You can either answer analytically or write code.