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title: 'CIND123 Winter 2018 - Assignment #2'
author: "Write your mname here"
date: "."
output:
  pdf_document: default
  word_document: default
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```

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <<http://rmarkdown.rstudio.com>>.

Use RStudio for this assignment.
 Edit the file `assignment-2.Rmd` and insert your R code where wherever you see the string "INSERT YOUR ANSWER HERE"

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document.

When your are done with your answers and before submitting, save the file with the following naming convention :your **LastName_firstname**

Submit **both** the rmd and the pdf output(or word or html) files, failing to submit **both** will be subject to mark deduction.

This assignment may make use of data provided by the `ISwR` package.

```

```{r}
#library(ISwR)
```

```

Sample Question and Solution

Use `seq()` to create the vector $(1, 2, 3, \dots, 10)$.

```

```{r}
seq(1,10)
```

```

```

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## Question 1 (50%)

```

Consider the probability distribution associated with rolling 3 fair dice.

We can label the faces of a single die using the numbers from 1 to 6.

We can therefore label the simple events in this distribution by triples of numbers from 1 to 6.

Let `d1`, `d2`, and `d3` represent the labels on each of the dice.

a) Set `d1` to the sequence $(1, 2, \dots, 6)$ repeated 36 times.

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```{r}
#Insert your answer here
```
```

b) Set ``d2`` to the sequence consisting of 6 repetitions of the sequence in which each of the numbers $(1, 2, \dots, 6)$ is repeated 6 times.

```
```{r}
#Insert your answer here
```
```

c) Set ``d3`` to the sequence in which each of the numbers $(1, 2, \dots, 6)$ is repeated 36 times.

```
```{r}
#Insert your answer here
```
```

d) Create a new data frame ``three.dice`` from ``d1``, ``d2``, and ``d3`` and print it.
Visually confirm that there are $6 \times 6 \times 6 = 216$ rows and each row contains a unique combination of dice labels.

```
```{r}
#Insert your answer here
```
```

e) Since the dice are fair and independent, each simple event has the same probability, namely $\frac{1}{216}$. Add the column ``P`` to the data frame with this value.

```
```{r}
#Insert your answer here
```
```

f) Add a new column ``sum`` equal to the sum of the dice labels.
Add another new column ``mean`` equal to the average of the dice labels.

```
```{r}
#Insert your answer here
```
```

g) Plot a probability histogram of ``three.dice$sum``.

```
```{r}
#Insert your answer here
```
```

h) Compute the probability that the sum of the dice is greater than 12 and less than 18.

****HINT**:** Use ``subset()`` to select the events and sum ``P``.

```
```{r}
#Insert your answer here
```
```

i) Compute the probability that the sum is even.

```
```{r}
#Insert your answer here
```

```

```
j) Compute the probability that the mean is exactly 4.

```{r}
#Insert your answer here
```

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## Question 2 (50%)
a) You have two groups of distinctly different items, 10 in the first
group and 8 in the second. If you select one item from each group, how
many different pairs can you form?
```{r}
#use the mn rule
#Insert your answer here
```

b) Evaluate the following permutation  $P_3^5$ 
```{r}
#Insert your answer here
```

c) Evaluate the following combinations  $C_3^5 + C_2^5$ 
```{r}
#Insert your answer here
```

d) In how many ways can you select five people from a group of eight if
the order of selection is important?
```{r}
#Since order is important, you might need to use permutations
#Insert your answer here
```

e) In how many ways can you select two people from a group of 20 if the
order of selection is not important?
```{r}
#Since order is unimportant, you might need to use combinations
#Insert your answer here
```

```

END of Assignment #2.