Chirp

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Objectives

In this project, we try to visualize the **chirp** signal. Since this signal varies in power based on the frequency, visualization in the frequency domain using the **fft** of the signal is recommended.

In addition, for plotting, we will use the **ggplot2** library.

Chirp

The utility chirp can generate a chirp signal of a specified chirpiness.

```
usage: chirp outputfilename [chirpiness=0.1 [amplitude=1.0 [startfreq=220 endfreq=220]]]
```

Setup the environment

```
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(ggplot2)
```

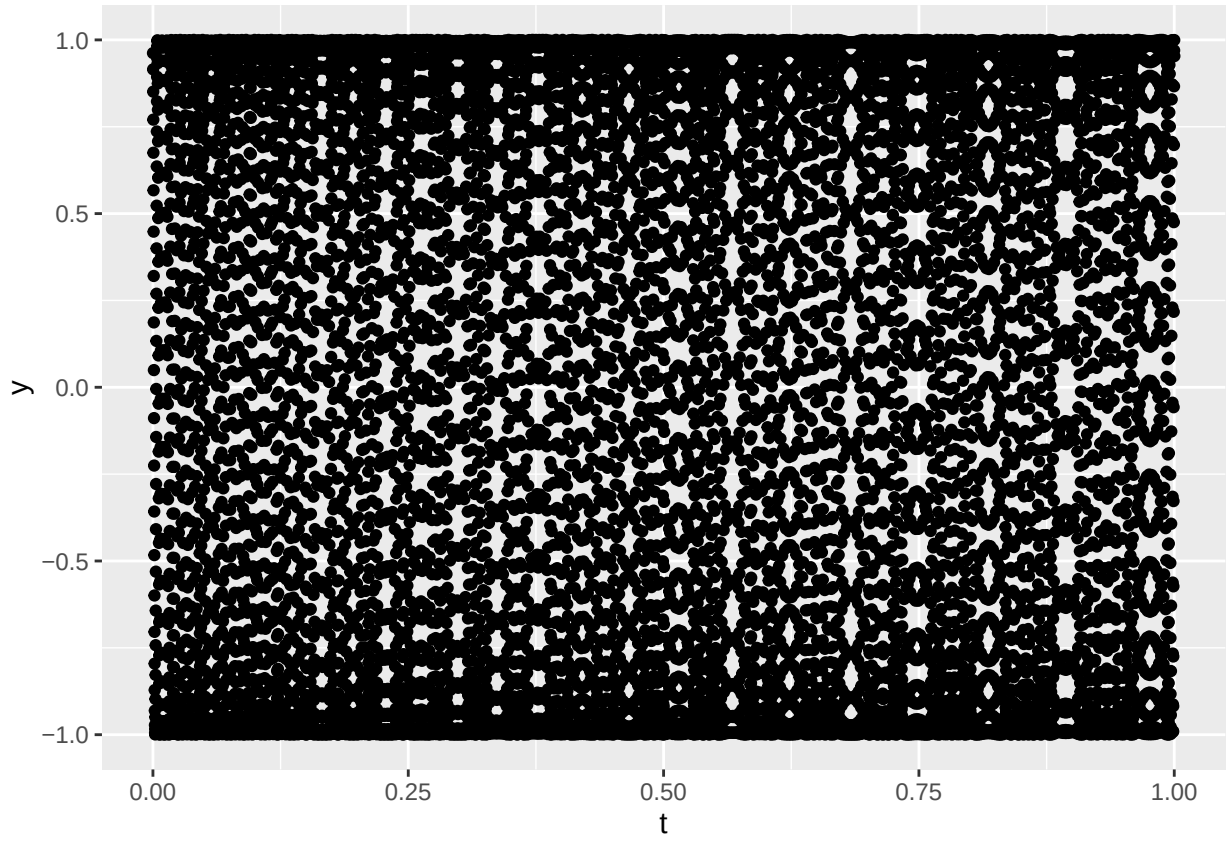
Basic chirp signal - time domain

Generate a simple chirp signal .

```
../../chirp/bin/chirp chirp.csv
```

Time domain plot

```
chirp<-read.csv("chirp.csv")
names(chirp)<-c("t","y")
ggplot(chirp,aes(x=t,y=y))+geom_point()
```



Frequency Domain transition

```
fdomain <- data.frame( f = seq( 0, nrow(chirp) - 1 ) / ( nrow(chirp) * diff( chirp$t[ 1:2 ] ) ) )
fdomain$mag <- Mod( fft( chirp$y ) )
ggplot(slice_head(fdomain,n=700),aes(x=f,y=mag))+geom_line()
```