

Quiz #2

Probability distributions

To demonstrate more tools, we leave the HELP dataset and show examples of how data can be generated within each programming environment. We will generate values from the normal and t distribution densities; note if you do this in SAS, the probability density functions will have to be hard-coded.

1. Create a data set that has three variables titled **x**, **norm**, and **t**:
 - a. **x** should range from -4 to +4 and increment by 0.1
 - b. **norm** should be the normal density function associated with values of **x**
 - c. **t** should be the associated t density function with degrees of freedom 1.
2. Use the code below to generate a plot of your generated distributions

SAS

```
legend1 label=none position=(top inside right) frame
down=2 value = ("N(0,1)" tick=2 "t with 1 df");
axis1 label=(angle=90 "f(x)") minor=none order=(0 to .4 by
.1);
axis2 minor=none order=(-4 to 4 by 2);
symbol1 i=j v=none l=1 c=black w=5;
symbol2 i=j v=none l=21 c=black w=5;
proc gplot data= dists;
    plot (norm t) * x / overlay legend=legend1
        vaxis=axis1 haxis=axis2;
run; quit;
```

R

```
plot(x, norm, type="n", ylab="f(x)", las=1)
> lines(x, norm, lty=1, lwd=2)
> lines(x, t, lty=2, lwd=2)
> legend(1.1, .395, lty=1:2, lwd=2,
legend=c(expression(N(mu == 0, sigma == 1)),
paste("t with ", dfval, " df", sep="")))
```