

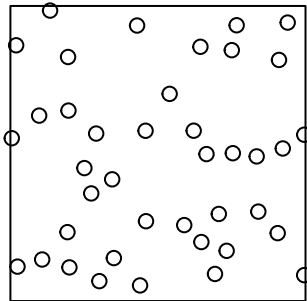
HW 4

Question 1:

For this question, consider the two point patterns generated below.

```
set.seed(02142025)
Z <- rStraussHard(beta = 100, gamma = 1, R = .1, H = .08)
plot(Z)
```

Z



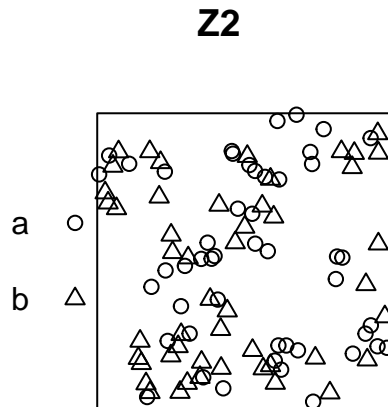
```
nclust2 <- function(x0, y0, radius, n, types=c("a", "b")) {
  X <- runifdisc(n, radius, centre=c(x0, y0))
  M <- sample(types, n, replace=TRUE)
  marks(X) <- M
}
```

```

    return(X)
}

Z2 <- rNeymanScott(15,0.1,nclust2, radius=0.1, n=5)
plot(Z2)

```



1.1 (4 points):

Compare and contrast the Neyman-Scott Process with the Strauss Hardcore process

1.2 (2 points):

Give an example of real-world situation that could be modeled using a Neyman-Scott Process.

1.3 (2 points):

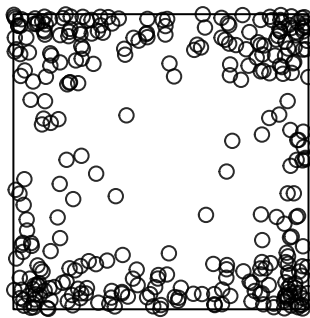
Give an example of real-world situation that could be modeled using a Strass Hardcore Process.

Question 2 (10 points)

Assume you've been given the point pattern `pp_out` and four potential explanatory covariates, `X1`, `X2`, `X3`, and `X4`. Carry out an analysis to choose the best representation of the intensity surface. Summarize your results - include figures and a written description.

```
load(url('https://github.com/Stat534/HW/raw/refs/heads/main/ims.RData'))
plot(pp_out)
```

pp_out



Question 3 (2 points)

How do intensity and density surfaces differ?

Question 4 (2 points)

What are strengths and weaknesses of leaflet for spatial visualization?

Question 4 (2 points)

What is a marked point process?