

Code Examples

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Chapter 3

Section 1.2

```
N <- 5
.consecutive_pairs(N)

##   i j
## 1 2 1
## 2 3 2
## 3 4 3
## 4 5 4

\begin{lstlisting}[language=R]
# Helper function in the source code
pair_indices <- .consecutive_pairs(N = 5)
# Outputs the following
pair_indices
...
  i j eig_i      eig_j      id_diff      id_diff_norm abs_diff diff_ij
1 2 1 -0.5434-1.3539i -0.5434+1.3539i 0.0000+2.7078i 2.7078      0.0000    1
2 3 2 0.2255+1.4250i -0.5434-1.3539i -0.7689-2.7789i 2.8833      0.0161    1
3 4 3 0.2255-1.4250i 0.2255+1.4250i   0.0000+2.8500i 2.8500      0.0000    1
4 5 4 -0.8678+0.0000i 0.2255-1.4250i 1.0933-1.4250i 1.7961      0.5749    1
\end{lstlisting}
```

Section 1.3

```
set.seed(23)
P <- RM_norm(N = 5, mean = 0, sd = 1)
disp_P <- dispersion(P, pairs = "consecutive")

## Warning in if (class(array) == "list") {: the condition has length > 1 and only
## the first element will be used

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## the first element will be used

# Outputs the following
disp_P

##   i j      eig_i      eig_j      id_diff id_diff_norm abs_diff diff_ij
## 1 2 1 -0.54-1.35i -0.54+1.35i 0.00+2.71i      2.71      0.00      1
```

```
## 2 3 2 0.23+1.43i -0.54-1.35i -0.77-2.78i 2.88 0.02 1
## 3 4 3 0.23-1.43i 0.23+1.43i 0.00+2.85i 2.85 0.00 1
## 4 5 4 -0.87+0.00i 0.23-1.43i 1.09-1.43i 1.80 0.57 1

\begin{lstlisting}[language=R]
library(RMAT)
P <- RM_norm(N = 5, mean = 0, sd = 1)
disp_P <- dispersion(P, pairs = "consecutive")
# Outputs the following
disp_P
...
  i j eig_i      eig_j      id_diff      id_diff_norm abs_diff diff_ij
1 2 1 -0.5434-1.3539i -0.5434+1.3539i 0.0000+2.7078i 2.7078 0.0000 1
2 3 2 0.2255+1.4250i -0.5434-1.3539i -0.7689-2.7789i 2.8833 0.0161 1
3 4 3 0.2255-1.4250i 0.2255+1.4250i 0.0000+2.8500i 2.8500 0.0000 1
4 5 4 -0.8678+0.0000i 0.2255-1.4250i 1.0933-1.4250i 1.7961 0.5749 1
\end{lstlisting}
```

Beta Ensemble Dispersion

```
set.seed(23)
ens <- RME_beta(N = 4, beta = 4, size = 3)
disp_ens <- dispersion(ens, pairs = "consecutive")

## Warning in if (class(array) == "list") {: the condition has length > 1 and only
## the first element will be used

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## the first element will be used

## Warning in if (class(array) == "list") {: the condition has length > 1 and only
## the first element will be used
```

```
# Outputs the following
disp_ens

##   i j   eig_i   eig_j id_diff id_diff_norm abs_diff diff_ij
## 1 2 1 -3.78+0i  4.00+0i  7.78+0i      7.78    0.22      1
## 2 3 2  2.06+0i -3.78+0i -5.84+0i      5.84    1.72      1
## 3 4 3  0.19+0i  2.06+0i  1.88+0i      1.88    1.88      1
## 4 2 1  3.80+0i -4.00+0i -7.80+0i      7.80    0.20      1
## 5 3 2 -1.80+0i  3.80+0i  5.60+0i      5.60    2.00      1
## 6 4 3  0.89+0i -1.80+0i -2.69+0i      2.69    0.92      1
## 7 2 1  3.51+0i -3.53+0i -7.04+0i      7.04    0.03      1
## 8 3 2  1.35+0i  3.51+0i  2.16+0i      2.16    2.16      1
## 9 4 3 -0.67+0i  1.35+0i  2.02+0i      2.02    0.68      1
```

```
\begin{lstlisting}[language=R]
library(RMAT)
ens <- RME_beta(N = 4, beta = 4, size = 3)
disp_ens <- dispersion(ens, pairs = "consecutive")
# Outputs the following
disp_ens
...
i j eig_i      eig_j      id_diff idddf_norm abs_diff diff_ij
```

```

2 1 -3.78+0i 4.00+0i 7.78+0i 7.78 0.22 1
3 2 2.06+0i -3.78+0i -5.84+0i 5.84 1.72 1
4 3 0.19+0i 2.06+0i 1.88+0i 1.88 1.88 1
2 1 3.80+0i -4.00+0i -7.80+0i 7.80 0.20 1
3 2 -1.80+0i 3.80+0i 5.60+0i 5.60 2.00 1
4 3 0.89+0i -1.80+0i -2.69+0i 2.69 0.92 1
2 1 3.51+0i -3.53+0i -7.04+0i 7.04 0.03 1
3 2 1.35+0i 3.51+0i 2.16+0i 2.16 2.16 1
4 3 -0.67+0i 1.35+0i 2.02+0i 2.02 0.68 1
\end{lstlisting}

```