HARD_SOL

DISHA

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Contents

0.1 Step 1: Install & Load Packages

```
library(igraph)
```

```
##
## Attaching package: 'igraph'

## The following objects are masked from 'package:stats':
##
##     decompose, spectrum

## The following object is masked from 'package:base':
##
##     union
```

```
library(data.table)
```

0.2 Step 2: Define Schema Relationships as a Graph

```
edges <- data.table(from = c("Customers", "Orders", "Orders", "Payments", "Products"),
                    to = c("Orders", "Payments", "Products", "Refunds", "Suppliers"))

# Convert into Graph Structure
graph <- graph_from_data_frame(edges, directed = TRUE)
```

0.3 Step 3: Compute Network Metrics

```
node_degree <- degree(graph, mode = "all")  # Total connections (in + out)
betweenness_values <- betweenness(graph)  # Centrality measure
```

0.4 Step 4: Add Node Attributes (Size, Color)

```
V(graph)$size <- node_degree * 5 + 15  # Adjust size based on degree
V(graph)$color <- ifelse(node_degree > 2, "red", "lightblue")  # Highlight key nodes
V(graph)$label <- V(graph)$name  # Display table names
```

0.5 Step 5: Plot the Enhanced Graph with Advanced Layout

```
set.seed(42)  # Ensures consistent layout
plot(graph,
     layout = layout_with_kk(graph),  # Kamada-Kawai layout for better structure
     vertex.size = V(graph)$size,
     vertex.color = V(graph)$color,
     vertex.label.cex = 1.2,
     edge.arrow.size = 0.7,
     edge.color = "darkgrey",
     main = "Advanced Database Schema Representation")
```