

# Analiza sieci delfinów - zadanie igraph

Dawid Stasiak

2025-04-16

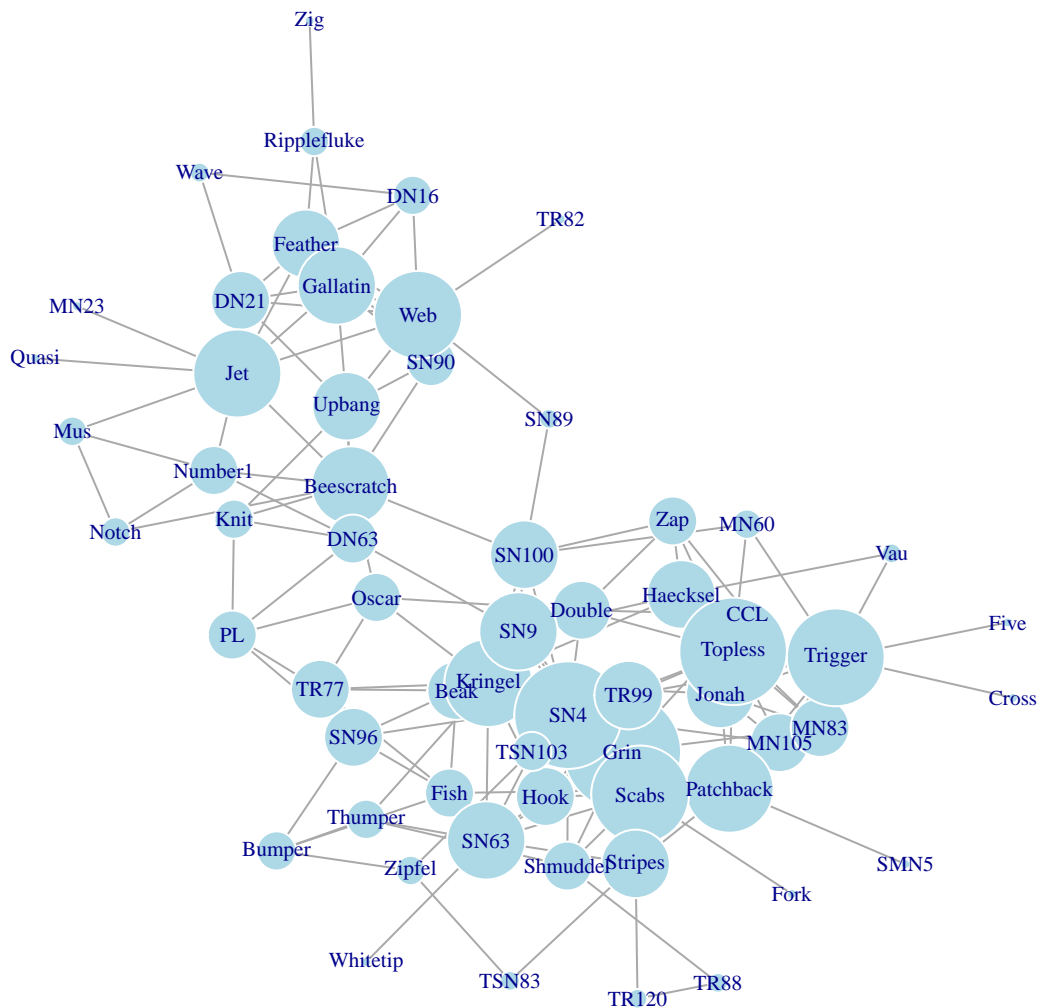
## Wczytanie danych

```
dolphins_graph <- read_graph("dolphins.gml", format = "gml")
```

## Wizualizacja sieci z wierzchołkami o wielkości proporcjonalnej do stopnia

```
vertex_degrees <- degree(dolphins_graph)
layout_kk <- layout_with_kk(dolphins_graph)

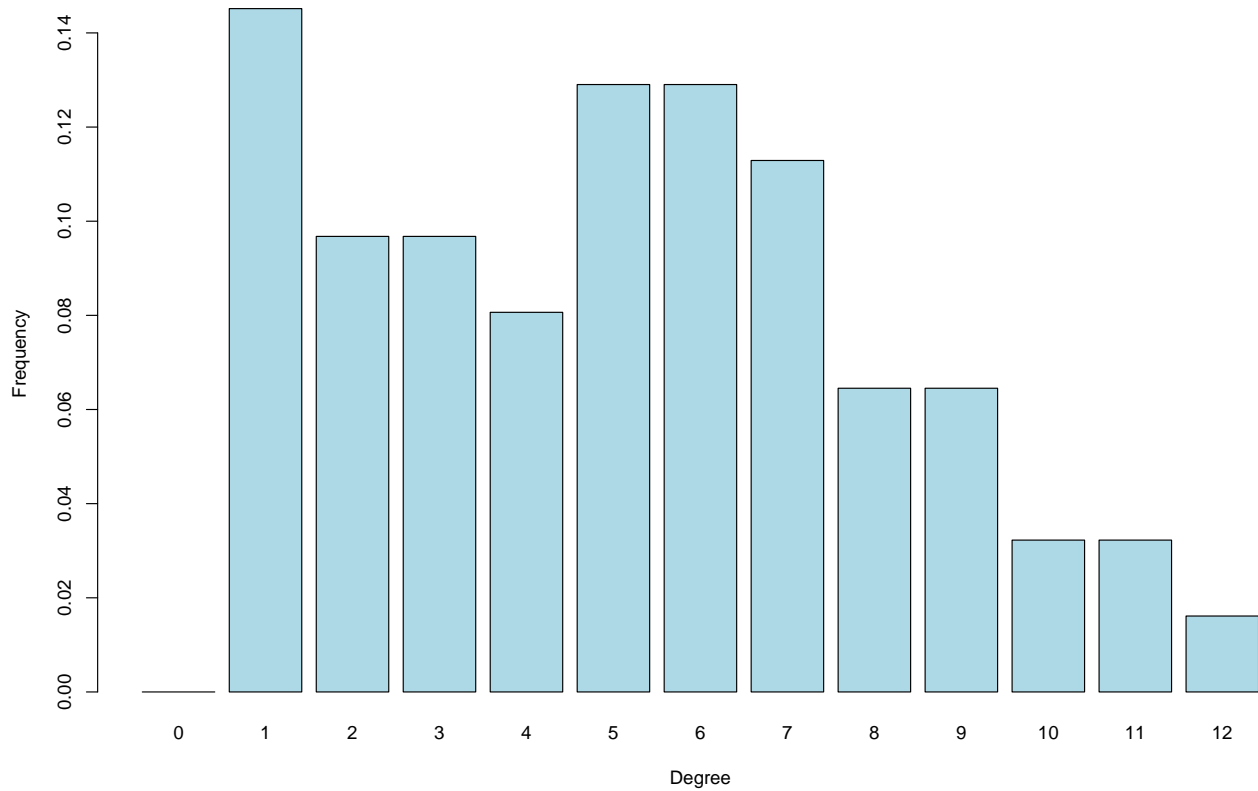
plot(dolphins_graph,
     vertex.size = vertex_degrees * 2,
     vertex.label = V(dolphins_graph)$label,
     vertex.label.cex = 0.7,
     vertex.color = "lightblue",
     vertex.frame.color = "white",
     layout = layout_kk)
```



## Rozkład stopni wierzchołków

```
deg_dist <- degree_distribution(dolphins_graph)

barplot(names = 0:(length(deg_dist)-1),
        height = deg_dist,
        xlab = "Degree",
        ylab = "Frequency",
        col = "lightblue")
```



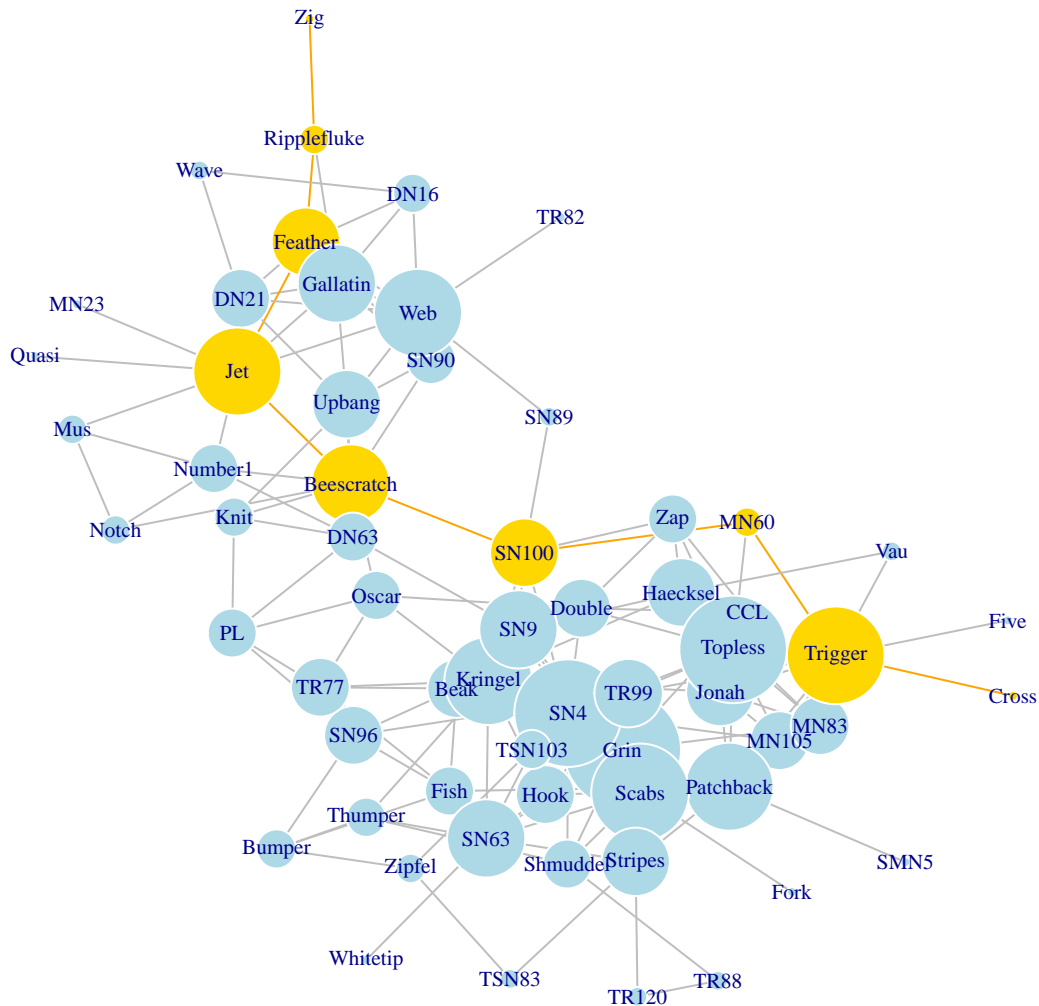
### Wizualizacja najdłuższej ścieżki w grafie (średnicy grafu)

```
diam <- get_diameter(dolphins_graph, directed = FALSE)

v_diam_colors <- rep("lightblue", vcount(dolphins_graph))
v_diam_colors[diam] <- "gold"

e_diam_colors <- rep("gray", ecoun(dolphins_graph))
e_diam_colors[E(dolphins_graph, path = diam)] <- "orange"

plot(dolphins_graph,
     vertex.size = vertex_degrees * 2,
     vertex.label = V(dolphins_graph)$label,
     vertex.label.cex = 0.7,
     vertex.color = v_diam_colors,
     vertex.frame.color = "white",
     edge.color = e_diam_colors,
     layout = layout_kk)
```



## Wizualizacja grup/społeczności występujących w grafie

```
clusters <- cluster_fast_greedy(as.undirected(dolphins_graph))
V(dolphins_graph)$community <- clusters$membership
v_cluster_colors <- adjustcolor(c("steelblue", "tomato", "gold", "yellowgreen"), alpha = 0.7)

plot(dolphins_graph,
     vertex.size = vertex_degrees * 2,
     vertex.label = V(dolphins_graph)$label,
     vertex.label.cex = 0.7,
     vertex.color = v_cluster_colors[V(dolphins_graph)$community],
     vertex.frame.color = "white",
     layout = layout_kk)
```

