HW3 – Strategies for Cumulative Benefit

ii.

```
centrality measures of node 1:  {'dc': 0.026501766784452298, 'cs': 0.3497065183812172, 'nbc': 0.008347578685386587, 'pr': 0.002245005694685942, 'auth': 0.00397656515228793}
centrality measures of node 50:  {'dc': 0.022968197879858657, 'cs': 0.3543035993740219, 'nbc': 0.0038980095170968805, 'pr': 0.0018929372095642383, 'auth': 0.0039572350636122595}
centrality measures of node 100:  {'dc': 0.0026501766784452294, 'cs': 0.2654784240150094, 'nbc': 7.142902633244772e-05, 'pr': 0.0003854856531958933, 'auth': 0.00017268773649965194}
```

iv.

```
best node to send the voucher to:  105
```

vi.

```
best node to send the voucher to:  23
```

viii.

```
best node to send the voucher to:  23
```

There is no difference in the nodes chosen, this means that the node that minimizes the steps also maximizes the total utility even when considering the depreciated value.

The lack of difference between the selected nodes in both functions suggests that the node with the highest closeness centrality naturally fulfills both criteria: minimizing steps and maximizing total benefit, even when accounting for the diminishing value of the voucher. The inherent properties of the node with the highest closeness centrality make it the optimal choice in both scenarios.

x.

```
best node to send the voucher to:  333
```