DISTRIBUTED GRAPH PROCESSING

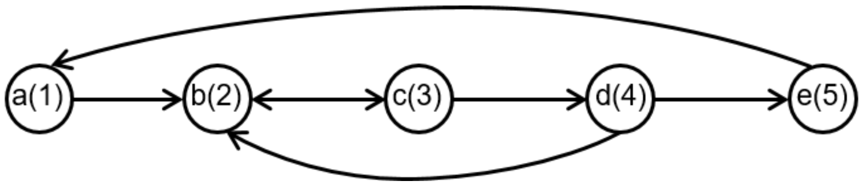

Figure 2.

For the connected graph in Figure 2, we want to compute the maximum value using the **theoretical TLAV framework**. For each vertex in the figure the letter is the identifier of the vertex denoted by v_i and the number in the brackets is the value of the vertex denoted by v_v. Assume the following kernel function:

```
maxVal = max(receive(val))
if maxVal>v_v then
  v_v = maxVal
foreach e_vj ∈ E do
   send(v_v,j) //send the new maximum to the neighbouring vertices
```

And the following initialization (assume the default value at each node is 0):

```
foreach v_i ∈ V do
  send v_v to v_i //initial messages sent. Each vertex receives the value shown in Figure 2
```

a. Provide a graph distribution for the vertex and edge views and draw the partitions you consider in the figure below. Consider at least two partitions for the vertex and edge views, respectively.

b. Run the first superstep on top of the graph distribution you proposed and identify all the messages generated on the figure below. Represent the messages to the vertices as *a_{msg}(value)*, where *a* is the node receiving the message and *value* the value received. If applicable, consider combining the messages to reduce communication costs.