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## Practical session 2

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**Alert:** Read the Instructions in the README file on Madoc.

Write methods for the tasks below. For each of them, provide in a comment its running time (worst case). When the question does not indicate the data structure(s) to use, you must choose that/those that provide the best worst case running time.

**Exercise 1.** Given a directed or undirected graph  $G$  and a vertex  $s$ , perform DFSNum( $s$ ) and compute the type of each arc.

**Exercise 2.** Given a directed or undirected graph  $G$ , decide - using the previous methods - whether  $G$  contains a cycle or not.

**Exercise 3.** Given a directed or undirected graph  $G$ , output the vertices of a cycle, when  $G$  contains a cycle. (Modify your previous algorithms.)