



Decryption activity (Group A)

Cryptography module

A secret message (a number) has been encrypted with the encryption technique showed before.

Your task is to decrypt the secret message.

In the following, you will be given some information

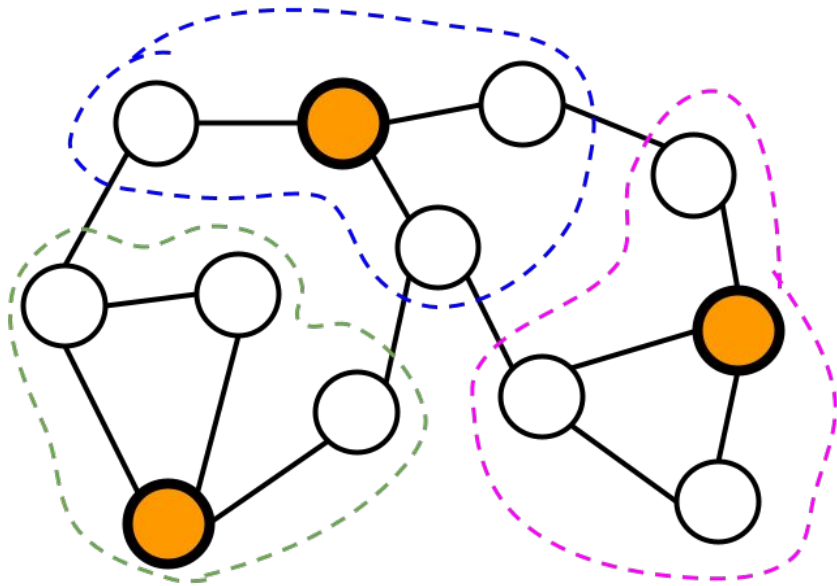
- the definition of a perfect dominating set (PDS)
- a secret message encrypted on a particular graph
- a specific PDS on that particular graph
- a link to verify if you decrypted the secret message correctly

Domination, dominating sets, perfect dominating sets (PDS)

A vertex v of a graph G dominates vertex u if there is an edge from v to u . The vertex v also dominates itself.

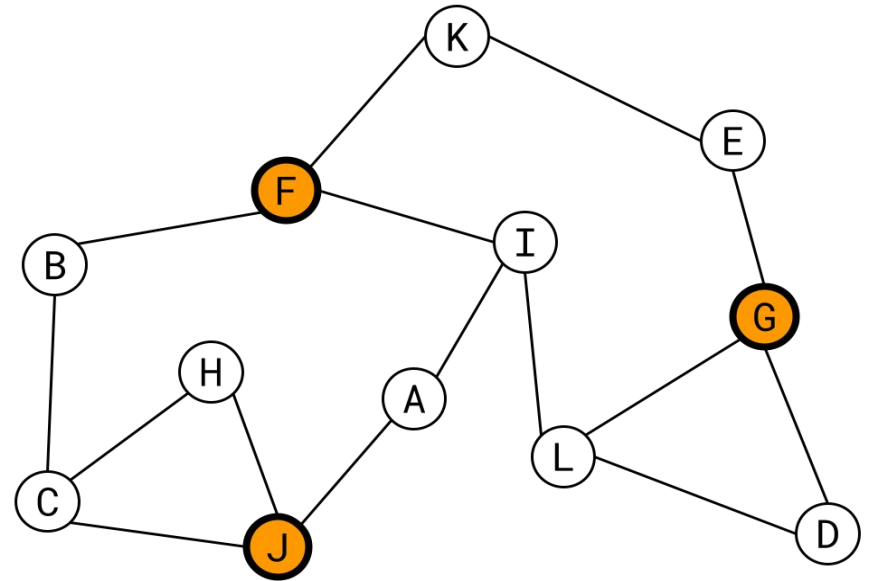
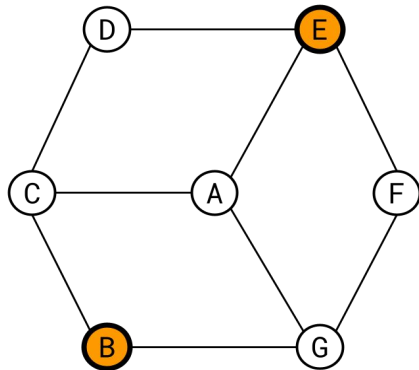
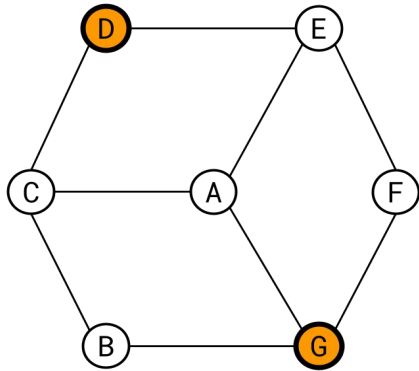
A set S of vertices of G is a dominating set of G if every vertex of G is dominated by a vertex in S .

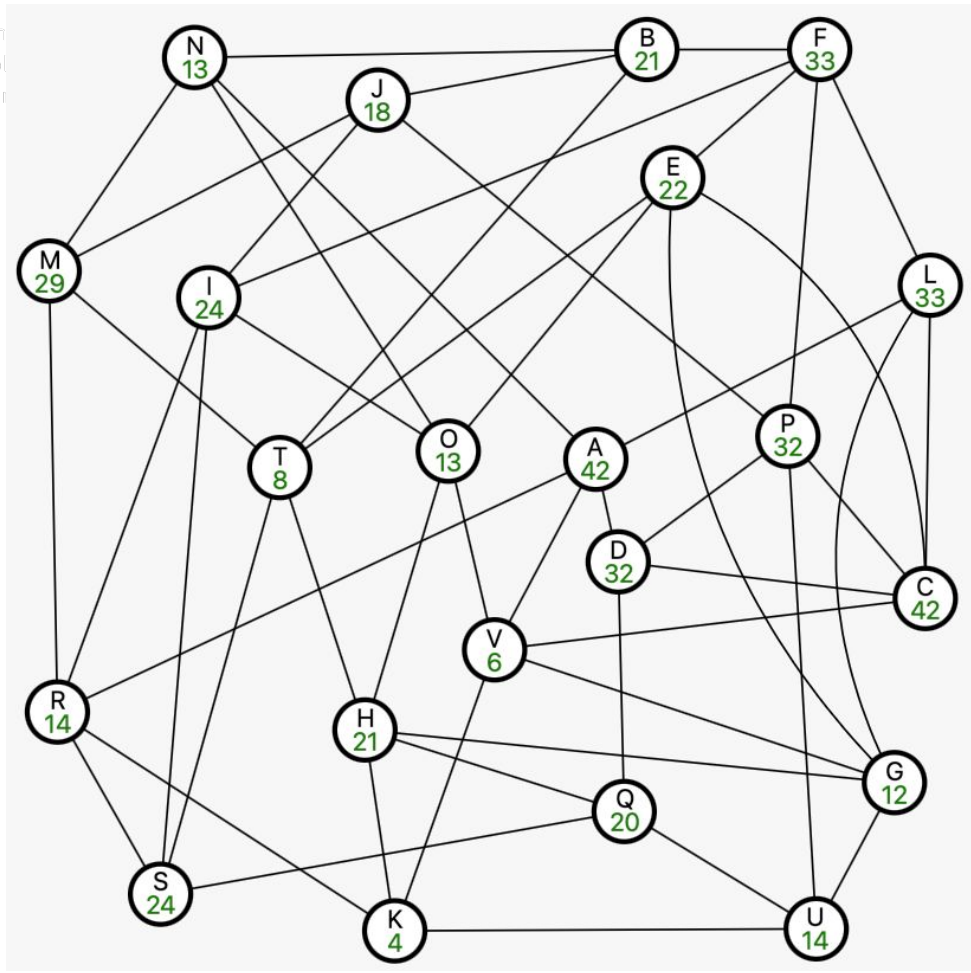
A set S of vertices of G is a *perfect dominating set* (PDS) if each vertex of G is dominated by exactly one vertex in S .



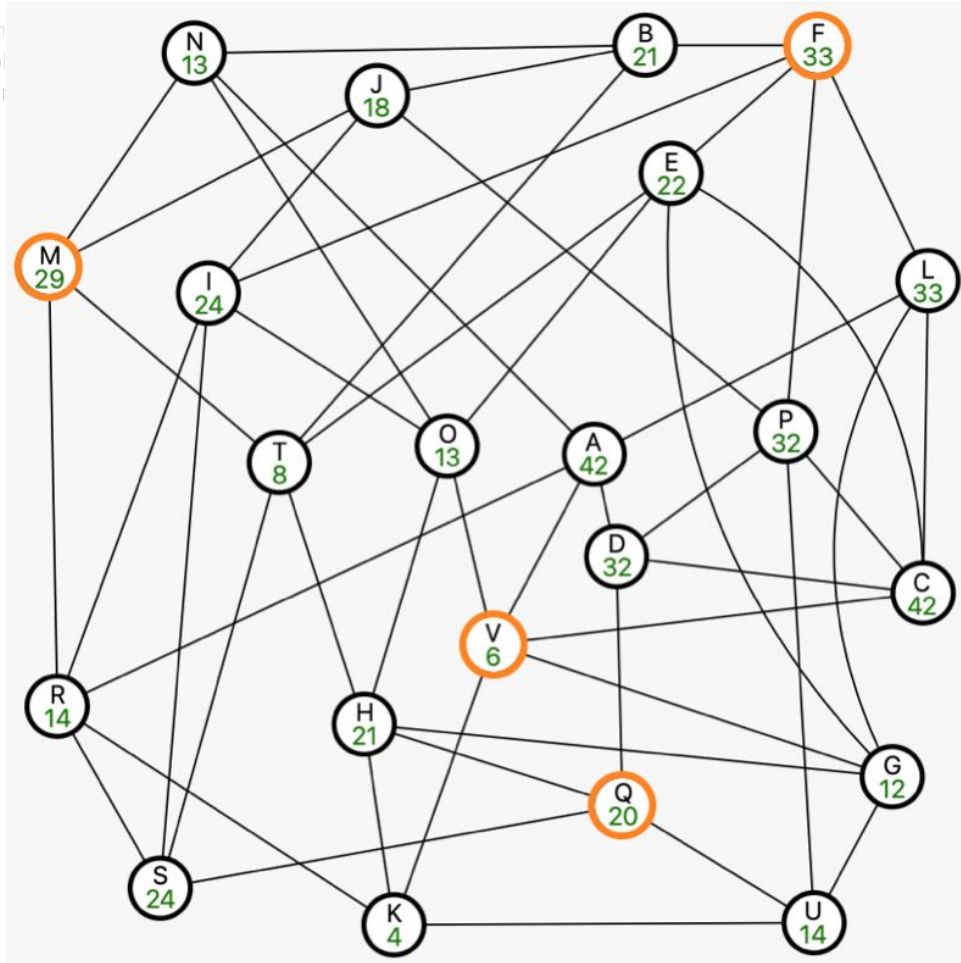
Perfect dominating set (PDS)

A **set S** of vertices of G a *perfect dominating set* (PDS) if each vertex of G is dominated by exactly one vertex in S .





The vertices
M, F, V, Q
are a PDS
of the given graph



Verify your decryption

A secret message (a number) has been encrypted.

Go to the following link to verify if you found the plaintext message on the graph.

The number is the key to open this treasure chest.

<https://bit.ly/2Se6Jes>

or, equivalently

<https://snap.berkeley.edu/embed?project=Lock&user=mycol&pauseButton=true>

IDENTITIES

Enlightening
Interdisciplinarity
in STEM
for Teaching



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



UNIVERSITAT DE
BARCELONA



ΠΑΝΕΠΙΣΤΗΜΙΟ ΚΡΗΤΗΣ
UNIVERSITY OF CRETE



UNIVERSITÀ
DI PARMA

Co-funded by the
Erasmus+ Programme
of the European Union



Grant Agreement n°2019-1-IT02-KA203-063184