$V = \{x_1, ..., x_n\}$
$G(V) = \{G = (V, E) / E \subseteq V^{(2)}\}$
$|G(V)| = 2^{\binom{n}{2}} = 2^{\frac{n(n-1)}{2}}$

$G(V), t^*, \underset{\sim}{t^*}$ relatie de echivalentă
$G_1 \overset{t^*}{\sim} G_2$

$(T_1) V = \{x_1, ..., x_n\}, G(V), G_1, G_2 \in G(V)$

$[d_{G_1}(x) = d_{G_2}(x), \forall x \in V] \Leftrightarrow G_1 \overset{t^*}{\sim} G_2$

<u>Dem:</u>
$`` \Leftarrow''$ evident
$`` \Rightarrow''$
<u>Lema 2</u>
Fie $V = \{x_1, ..., x_n\}, G(V), G \in G(V)$
$d_i := d_G(x_i), i \leq i \leq n$
$d_1 \geq ... \geq d_n$
$\exists G' \in G(V)$ cu următoarele proprietăti:
$G' \overset{t^*}{\sim} G \quad (\Rightarrow d_{G'}(x) = d_G(x), \forall x \in V)$
$x_1x_2, x_1x_3, ..., x_1x_{d_1+1} \in E'$

<u>Dem Lema 2</u>
<u>Cazul 1</u> $x_1x_2, ..., x_1x_{d_1+1} \in E \Rightarrow G' = G$
<u>Cazul 2</u> $\exists i \in \{2, ..., d_1+1\} cu x_1x_2, x_1x_3, ..., \left.\begin{matrix} x_1x_{i-1} \in E \\ x_1x_i \notin E \end{matrix}\right\} \Rightarrow \exists j, i < j \leq n : x_i, x_j \in E$
$G_1 = G - x_ix_k - x_1x_j + x_1x_i + x_jx_k$
$G \overset{t^*}{\sim} G_1 \overset{t^*}{\sim} G_2 \overset{t^*}{\sim} ... \overset{t^*}{\sim} G_p = G'$

<u>Lema 3</u>
$V = \{x_1, ..., x_n\}$
$G \in G(V)$
$x \in V$
$\exists G' \in G(V) : G' \overset{t^*}{\sim} G$
x este adiacent în G' cu d(x) vârfuri cu grade maxime diferite de d.

<u>T4 (Havel-Hakini)</u>
$s_0 = (d_1 \geq ... \geq d_n) \in N^*_{\geq 0}, d_1 \leq n-1$
$s_0 multiset grafic \Leftrightarrow s_0^1$ (este multiset grafic a unui graf simplu).
unde: $\underbrace{s_0^1 = d_2 - 1, d_3 - 1, ..., d_{1+i} - 1}_{d_1}, \underbrace{d_{1+2}, ..., d_n}_{n-1-d_1}$
<u>Dem</u>: $`` \Rightarrow''$ este multiset grafic atunci
$\exists G'$ cu $s(G') = s_0^1$

$V' = \{x_1, ..., x_n\}$ a.î. $d_i(x_i) = \begin{cases} d_{i-1}, 2 \leq i \leq d_1 + 1 \\ d_i, d_1 + 2 \leq i \leq n \end{cases}$ $G = G^1 + [x_1x_2] + [x_1x_3] + ... + [x_1x_n]$

G graf simplu $s(G) = s_0 \Rightarrow s_0$ multiset grafic.

"$\Rightarrow$" $s_0$ multiset grafic $\Rightarrow \exists G, s(G) = s_0$

Fie ...