\[ |\text{MDPC}(G)| \leftrightarrow \text{MDPC}(G) \]

\[ \text{MDPC}(G) \leq \alpha(G) \]
MBPc(G) = 2

\Rightarrow

MPc(G) = 1
G

\text{MPC}(G) \leq \alpha(G)?
independent set in $G$
2 ways of orienting each edge
\( MPC(G) = 1 \)  
\( \alpha(G) = \frac{n}{2} \)  
\[ \text{MDPC}(G) = \frac{n}{2} \leq \alpha(G) \]
$K_n$

$\alpha(K_n) = 1$

Hamiltonian path — which visit each vertex once only one
\[
\alpha(G) = \alpha'(G) + h - 2\alpha'(G) = h - \alpha'(G) = h - \beta(G)
\]
$P$ is minimal path cover

Then $P$ an independent set $S$

such that for $P \in P$, $S \cup P \neq \emptyset \implies |S| \geq 1$
\[ S = \{ x \in S \text{ s.t. } x \neq S \} \]
$T$ is a maximal independent set

$y \in V(G) - \bar{T}$

$\not\exists \{v, y \}$

$\leftarrow$ not independent
$P$ is a path cover.

$P \not\subseteq P_3$.
\( \mathcal{P} \) is a minimal path cover if no other \( \mathcal{P}' \) such that \( \text{term}(\mathcal{P}') \subseteq \text{term}(\mathcal{P}) \)
\(a, b, c, d, e, f\)

\[a \leq b \leq c \leq d \leq e \leq f\]

\((a, b) \in \mathbb{R}, \ (b, c) \in \mathbb{R}\)

\[a \rightarrow b \rightarrow c \rightarrow d \rightarrow e\]
anti chain

(a, b) ∈ R
(b, a) ∈ R
(P, \leq)

Dilworth's theorem

\text{min \# chains} = \text{max cardinality of an antichain}
\( \alpha(G) \) = \( \text{min} \# \text{chains to cover the partial order} \) \( \geq \) \( \text{MBPc}(G) \) 

# the card. of the max anti chain