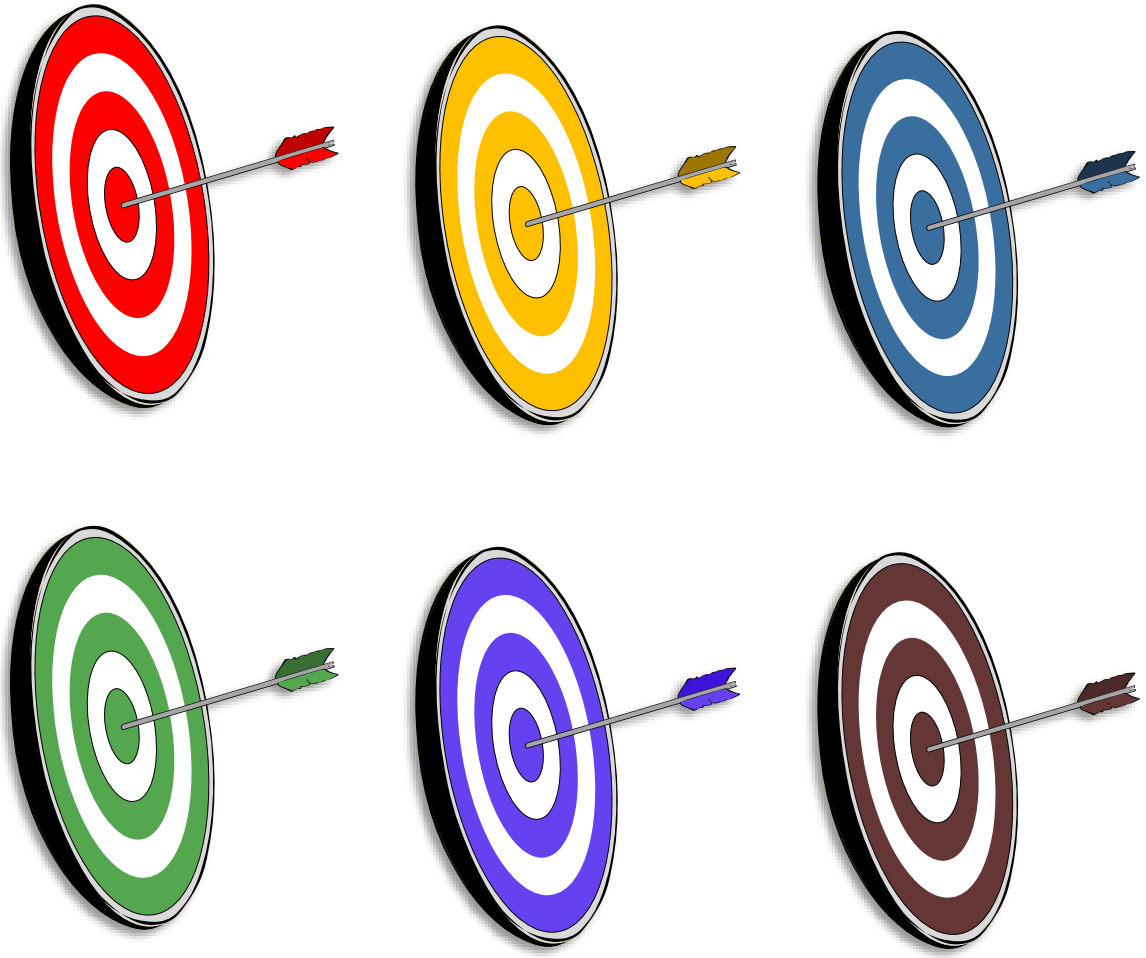
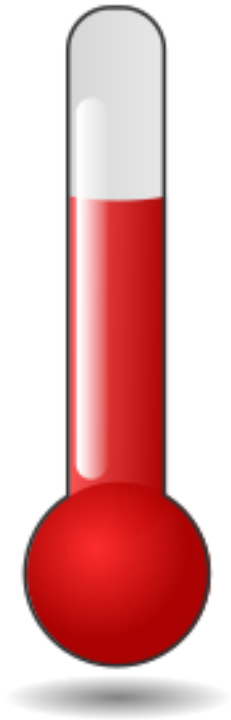
Multi-objective Optimization Problems

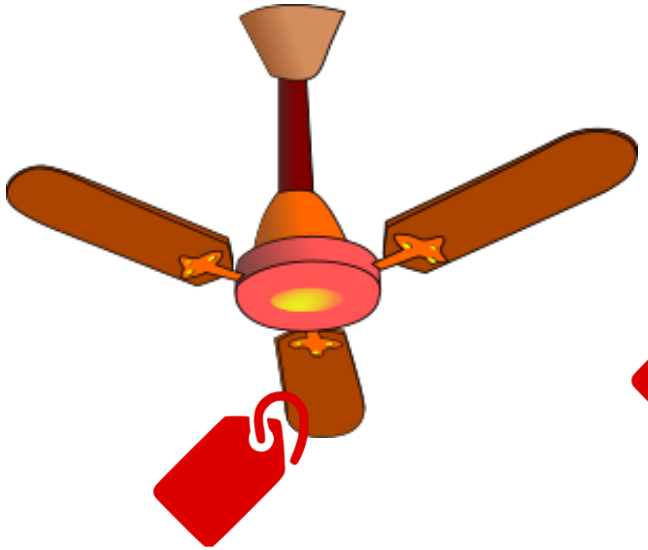
SINGLE-OBJECTIVE VS. MULTI-OBJECTIVE

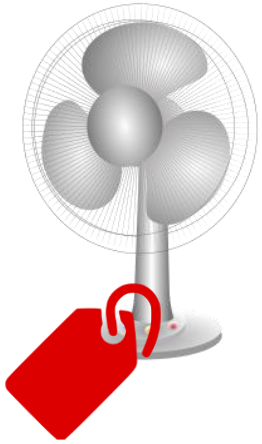


A HOT SUMMER



MINIMIZE THE PRICE





MINIMIZE THE PRICE

MINIMIZE THE PRICE

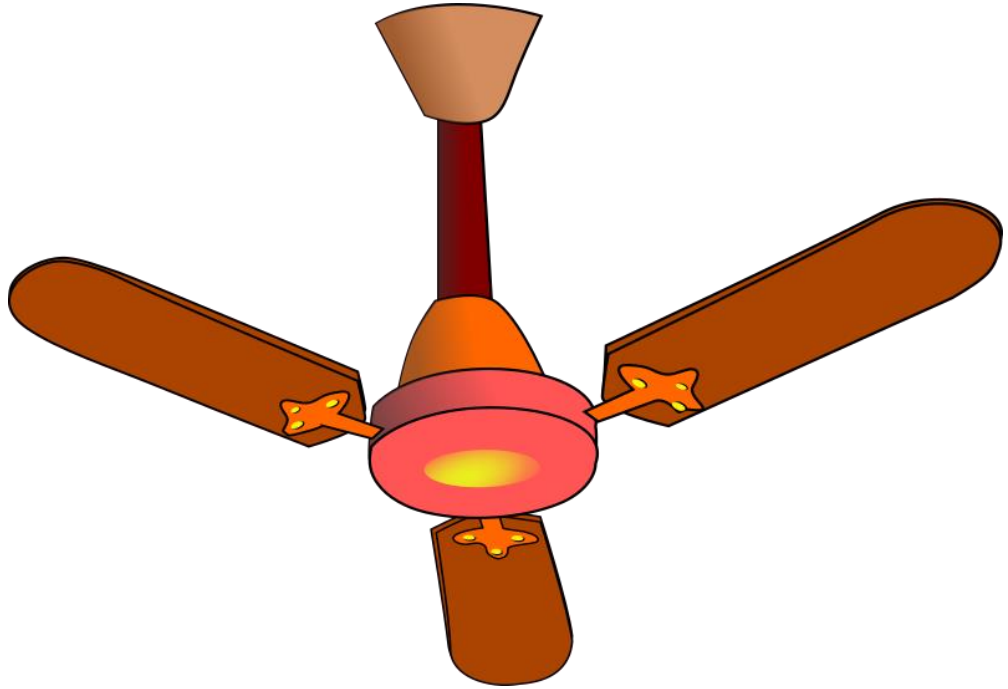
BEST FAN WHEN MINIMIZING PRICE

$10

MAXIMIZE COMFORT

MAXIMIZE COMFORT

BEST FAN WHEN MAXIMIZING THE COMFORT



100%

COMPARING TWO FANS USING ONE OBJECTIVE

Relational operators

$<$

$\leq$

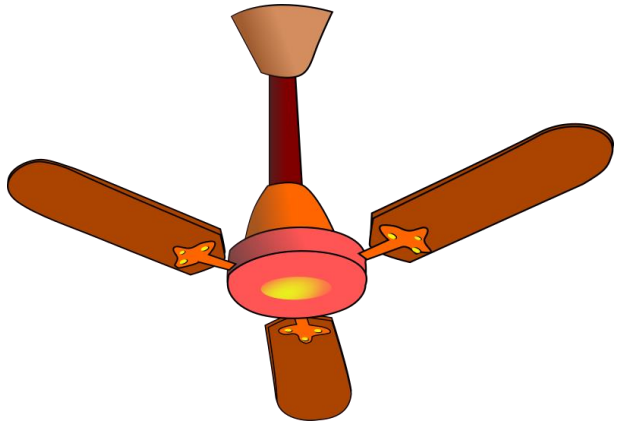
$>$

$\geq$

$=$

$\neq$

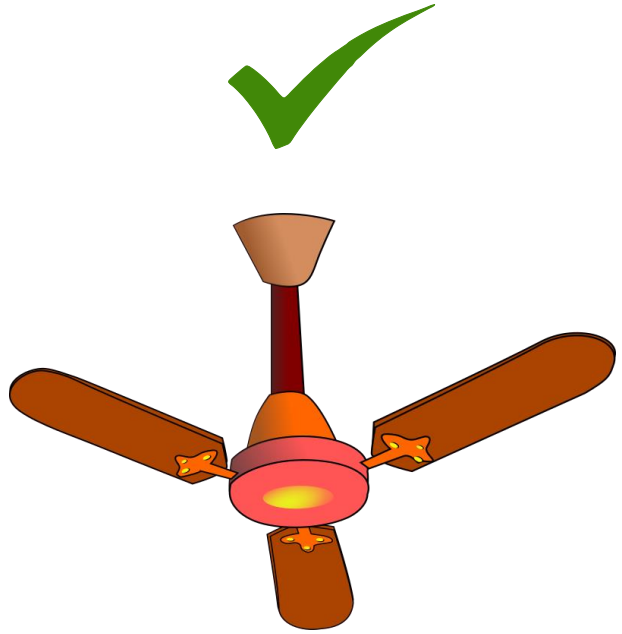
COMPARING TWO FANS USING ONE OBJECTIVE



Price: $100 **is better than** Price: $500

$100 < $500

COMPARING TWO FANS USING ONE OBJECTIVE



Comfort: 30% **is not better than** Comfort: 100%

100% > 30%

OTHER OBJECTIVES

Price: $100

Comfort: 30%

Energy consumption: 80 W

Efficiency: 60%

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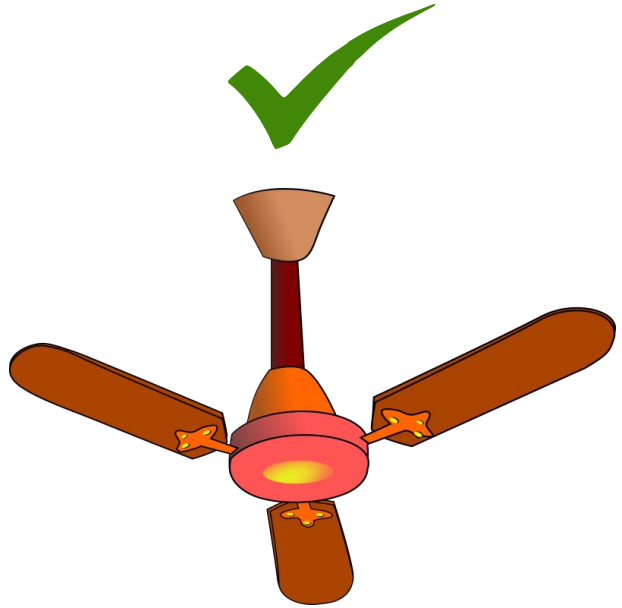
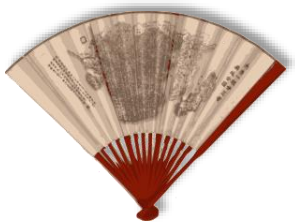
MULTI-OBJECTIVE OPTIMIZATION

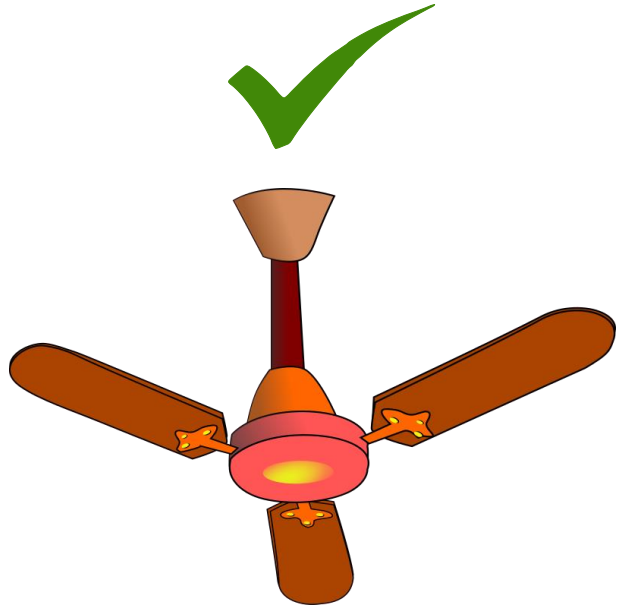


$100 < $500

30% < 100%

MULTI-OBJECTIVE OPTIMIZATION

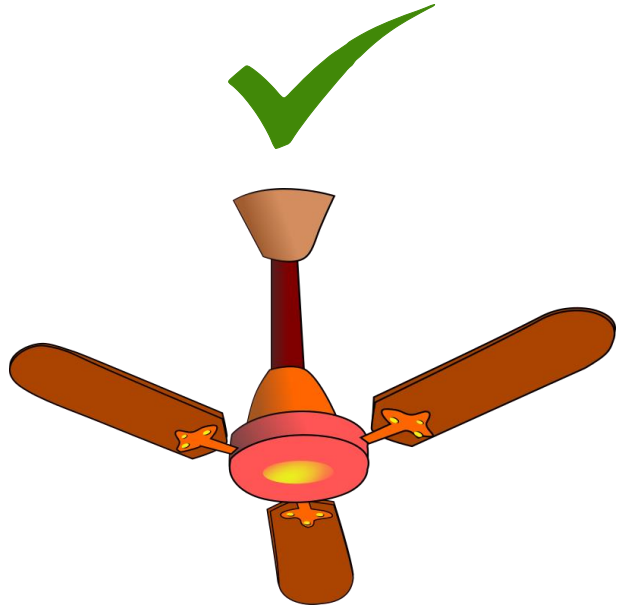




$10 < $500

0% < 100%

WHICH SOLUTION IS BETTER IN A MULTI-OBJECTIVE PROBLEM?



$1000 > $500

0% < 100%