Decision Variables

$$
\begin{aligned}
x_1 &\equiv \text{SprintCount: integer, } 1 \leq x_1 \leq 50 \\
x_2 &\equiv \text{TeamSize: integer, } 3 \leq x_2 \leq 10 \\
x_3 &\equiv \text{SprintDuration: integer (days), } 7 \leq x_3 \leq 30 \\
x_4 &\equiv \text{BudgetAllocation: continuous, } 0 \leq x_4 \leq 10^7 \\
x_5 &\equiv \text{WorkHours: integer (per day), } 4 \leq x_5 \leq 10 \\
x_6 &\equiv \text{MaxBlockers: integer, } 0 \leq x_6 \leq 5 \\
x_7 &\equiv \text{Capacity: integer (story points), } 10 \leq x_7 \leq 200 \\
x_8 &\equiv \text{ReleaseFreq: integer (per year), } 1 \leq x_8 \leq 12 \\
x_9 &\equiv \text{BacklogItems: integer, } 1 \leq x_9 \leq 50 \\
x_{10} &\equiv \text{DocLeadTime: integer (days), } 0 \leq x_{10} \leq 14
\end{aligned}
$$

Objectives

Multi-objective optimization with:

$$
\begin{aligned}
&\max f_1(x) = \text{Velocity}(x) && \text{(maximize average story points per sprint)} \\
&\min f_2(x) = \text{DefectCount}(x) && \text{(minimize bugs in snapshots)} \\
&\max f_3(x) = \text{StakeholderScore}(x) && \text{(maximize feedback score)} \\
&\min f_4(x) = \text{CycleTime}(x) && \text{(minimize story cycle time)} \\
&\max f_5(x) = \text{FeatureThroughput}(x) && \text{(maximize features per release)} \\
&\min f_6(x) = \text{BudgetVariance}(x) && \text{(minimize budget deviation)} \\
&\max f_7(x) = \text{TeamUtilization}(x) && \text{(maximize utilization)} \\
&\min f_8(x) = \text{BlockerCount}(x) && \text{(minimize blockers)} \\
&\max f_9(x) = \text{OnTimeRate}(x) && \text{(maximize on-time sprint completion)} \\
&\max f_{10}(x) = \text{BacklogHealth}(x) && \text{(maximize backlog health)}
\end{aligned}
$$

Constraints

$x_2 \leq 10$ (C1: TeamSizeLimit)

$x_3 = 14$ (C2: SprintLength fixed at 2 weeks)

$x_4 \leq B_{\max}$ (C3: BudgetCeiling)

$$\sum_{s \in S_{\text{req}}} \sum_{e \in E} \delta_{e,s} \geq |S_{\text{req}}|$$ (C4: SkillCoverage)

$\text{cert}_{\text{SM}} = 1,\ \text{cert}_{\text{PO}} = 1$ (C5: Certification Requirement)

$\forall e \in E:\ \text{avail}_e = 1$ (C6: Resource Availability)

$x_9 \leq Q_{\max}$ (C7: SprintBacklogSize)

$d_{\text{release}} \in [d_{\text{window,start}}, d_{\text{window,end}}]$ (C8: MarketWindow)

$$\forall t \in T: \sum_{m \in \text{meetings}} \mathbf{1}_{\text{attend}_t(m)} = |\text{meetings}|$$ (C9: Daily Scrum Attendance)

$\forall f \in F:\ \text{doc\_complete}_f = 1$ (C10: Documentation Status)