

茨城県内の高校交流による数理モデルを用いた地域課題解決提案

出張講義

筑波大合宿

1. モデル化実習

2. プログラミング実習

出張講義
最適化モデルとは
「●●をうまく決めて■ ■を最小(あるいは最大)にする」ための数理モデルです

最適化モデルとは？

- うまく決めたい ●●
- を変数であわし、それが満たすべき条件を数式で表す
- 最小にしたい ■■
- を数式で表す → 目的関数
- ある条件のもとで 目的関数を最小(あるいは最大)にする解を求めるモデルを、「最適化モデル」という

最適解



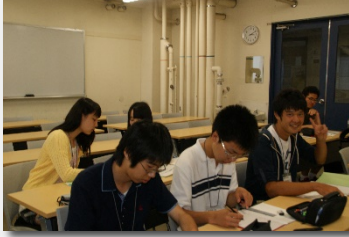
線形計画問題と整数計画問題

整数計画問題はもう少し難しい

$x_2 = x_1 + b \Leftrightarrow b = -x_1 + x_2$

紫の赤い点の中でbを最小にする点はあるか？

最適解



合宿2日目 最適化ソルバFico Xpressのプログラミングに挑戦 映し出された6つのPC画面で進捗状況を確認しています

XPRESS-MPで解いてみよう
2. MODELファイルを作成、保存

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model transportation
uses "mimxprs"

declarations
  xA1, xA2, xA3, xA4, xB1, xB2, xB3, xB4, xB5, xB6, xB7, xB8, xB9, xB10, xB11, xB12, xB13, xB14, xB15, xB16, xB17, xB18, xB19, xB20, xB21, xB22, xB23, xB24, xB25, xB26, xB27, xB28, xB29, xB30, xB31, xB32, xB33, xB34, xB35, xB36, xB37, xB38, xB39, xB40, xB41, xB42, xB43, xB44, xB45, xB46, xB47, xB48, xB49, xB50, xB51, xB52, xB53, xB54, xB55, xB56, xB57, xB58, xB59, xB60, xB61, xB62, xB63, xB64, xB65, xB66, xB67, xB68, xB69, xB70, xB71, xB72, xB73, xB74, xB75, xB76, xB77, xB78, xB79, xB80, xB81, xB82, xB83, xB84, xB85, xB86, xB87, xB88, xB89, xB90, xB91, xB92, xB93, xB94, xB95, xB96, xB97, xB98, xB99, xB100, xB101, xB102, xB103, xB104, xB105, xB106, xB107, xB108, xB109, xB110, xB111, xB112, xB113, xB114, xB115, xB116, xB117, xB118, xB119, xB120, xB121, xB122, xB123, xB124, xB125, xB126, xB127, xB128, xB129, xB130, xB131, xB132, xB133, xB134, xB135, xB136, xB137, xB138, xB139, xB140, xB141, xB142, xB143, xB144, xB145, xB146, xB147, xB148, xB149, xB150, xB151, xB152, xB153, xB154, xB155, 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