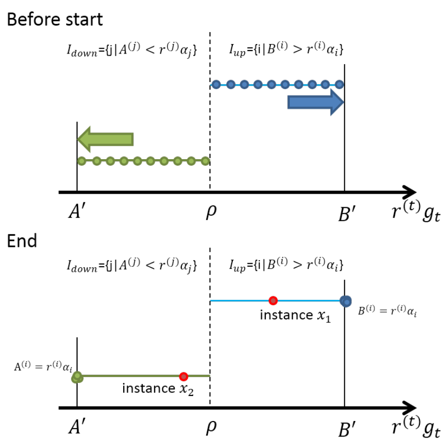
Answers of 11/11 TA's time

1. Assignment 3, 5(a)



   If $r^{(t)}g_t^* > \rho$ and $r^{(t)}\alpha_t^* < B^{(t)}$, then the instance t must be in I_{up}(consider instance x_1), meaning $\max_{i \in I_{up}} r^{(i)}g_i > \rho$ in Condition 1, a contradiction. Similarly, if $r^{(t)}g_t^* < \rho$ and $r^{(t)}\alpha_t^* > A^{(t)}$, then the instance t must be in I_{down}(consider instance x_2), leading to another contradiction $\rho > \min_{j \in I_{down}} r^{(j)}g_j$ to Condition 1.

2. Ch5, P.33, Line 8

   Line 8: $\forall k \in \{1 \ldots n\}\ \ g_k \leftarrow g_k - \lambda \cdot y_k \cdot K_{i,k} + \lambda \cdot y_k \cdot K_{j,k}$

   Actually, y_k equals to $r^{(k)}$ with different notation, notλ_{yk}.

   As we know, $g_t = 1 - r^{(t)} \sum_i r^{(i)} \alpha_i K_{i,t}$

   $g_t^{new} = 1 - r^{(t)} (\sum_{l=1 \ldots n\ \wedge\ l \neq i\ \wedge\ l \neq j} r^{(l)} \alpha_l K_{l,t} + r^{(i)} (\alpha_i + \lambda r^{(i)}) K_{i,t} - r^{(j)} (\alpha_j - \lambda r^{(j)}) K_{j,t}))$

   $= 1 - r^{(t)} \sum_{l=1}^{n} r^{(l)} \alpha_l K_{l,t} - r^{(t)} (r^{(i)} \lambda r^{(i)} K_{i,t}) + r^{(t)} (r^{(j)} \lambda r^{(j)} K_{j,t})$

   $= g_t - r^{(t)} \lambda K_{i,t} + r^{(t)} \lambda K_{j,t}$

3. Appendix C. P.70

   See another pdf.

4. Assignment 3, 2(b) Definition

   It is better to make a definition $h = \sum_{l=1}^{p} \gamma^{(l)} k(z^{(l)}, \cdot)$

   Thus, $\langle af + bg, h \rangle = \sum_{l=1}^{p} \gamma^{(l)} (\ \sum_{i=1}^{n} a\alpha^{(i)} k(x^{(i)}, z^{(l)}) + \sum_{j=1}^{m} b\beta^{(j)} k(y^{(j)}, z^{(l)})\ )$

   $= a \sum_{i=1}^{n} \sum_{l=1}^{p} \alpha^{(i)} \gamma^{(l)} k(x^{(i)}, z^{(l)}) + b \sum_{j=1}^{m} \sum_{l=1}^{p} \beta^{(i)} \gamma^{(l)} k(y^{(j)}, z^{(l)})$

   $= a \langle f, h \rangle + b \langle g, h \rangle$