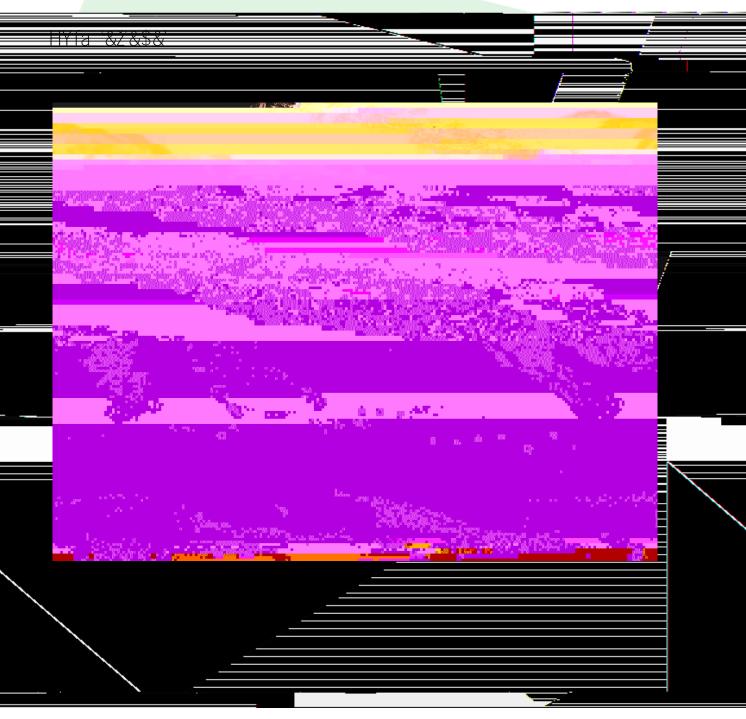
MINE9100

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MINE9100 // Term 2, 2023 // published at 31-05-2023 © UNSW Sydney, 2023

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K YVZ '=a dcfHJbh@]b_g.' <u>GW&cc^cZA]bYfU'g'UbX'9bYf[mFYgcifWfg'</u> <u>H\Y'BiWYig'GH XYbh<iV</u> <u>A ccX'Y</u> <u>I BGK '<UbXVcc</u> <u>I BGK 'H]a YHVYY</u> <u>Gh XYbhK Y``VY]b[</u> <u>I f[YbhA YbH)''<YU'h,'Z 'Giddcfh</u> <u>9ei]HVY'@YUfb]b['GYfj]Wfg</u>

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GhUfh'XUhY. '&, #\$*#&\$&' '%&\$\$`5A 8D \ulie &Uhu' a&*e\$+#&\$&' '%&\$\$`5A 8YUX`]bY'Zcf'UVgc`i hY'ZU]`. ''ghi XYbhg'a i ghVY'dfYgYbhcb'h\Y'Xi Y'XUhY

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!'FiXYbbcžJ"'&\$\$("'H\Y'A]b]b['JU'iUh]cb'<UbXVcc_ž&bX'YX]h]cbžKf][\hVcc_gžA]`hcbžE@8"'=G6B. \$+'%(\$\$+))"

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7 ci fgY 9j U`i Uh]cb UbX 8 Yj Y`cda Ybh

5 hih Y YbX'cZh Y Wci fgYžU```gh XYbhg'k]```\Uj Y h\Y'cddcfh b]hmhc'Wca d`YhY'U'Wci fgY'Yj U`i Uh]cb'Zcfa " H\YgY'Ubcbma ci g`gi fj Ymg`\Y`d`i g`i bXYfgHUbX'mci f`j]Yk g`cZh\Y'Wci fgYžmci f``YWh fYfg'UbX'h\Y'Wci fgY a UhYf]U`g"'K Y'UfY'Wcbh]bi ci g`m`]a dfcj]b[`ci f'Wci fgYg'VUgYX'cb'gh XYbhZYYXVUW_ž'UbX'mci f`dYfgdYWh]j Y]g`j U`i UV`Y"

K Y'U'gc'YbWci fU[Y'U```gh XYbhg`hc`g\UfY'UbmZYYXVUW_'h\Ym\Uj Y'Ubmh]a Y'Xi f]b['h\Y'Wci fgY'-`]Zmci \Uj Y'U'WcbWffbž'd'YUgY'WcbhUWfi g']a a YX]UhY`m"

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H\Y'GW\cc``\Ug'XYjY`cdYX'U'[i]XY`]bY'hc'\Y`d'mci'k\Yb'giVa]hf]b['U'WcifgY'Ugg][baYbh'

K Y`YbWci fU[Y`mci `hc`fYHJ]b`U`WcdmicZYj YfmUgg][ba Ybhigi Va]HYX`Zcf`UggYgga YbhZcf`mci f`ck b`fYWcfX Y]h\Yf`]b`\UfXWcdmicf`Y`YWfcb]WZcfa "

5```UggYgga Ybhg`a i gh\Uj Y`Ub`UggYgga YbhWcj Yf`g\YYhUhUWXYX"

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7 ci fgY Wca d`Yh]cb`fYei]fYg`gi Va]gg]cb`cZU```UggYgga Ybh`]hYa g"`: U]`i fY`hc`gi Va]h'U```UggYgga Ybh`]hYa g a UmifYgi `h`]b`h\Y`Uk UfX`cZUb`I bgUh]gZUWcfm: U]`i fY`fI : Ł`[fUXY`Zcf`h\Y`7 ci fgY`i b`Ygg`gdYW]U` Wcbg]XYfUh]cb`\Ug`VYYb`gi Va]hhYX`UbX`Uddfcj YX"

@UhY Gi Va]gg]cb cZUb 5gg][ba Ybh

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H\Y`Lb]jYfg]hmUbX`h\Y`:UW``hmdfcj]XY`U`k]XY`fUb[Y`cZgiddcfhgYfj]WYg`Zcf`ghiXYbhgž`]bWiX]b[.

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7 ci fgY'ci h]bYgžgi ddcfha UhYf]U`gʻUfY'i d`cUXYX'hc'A ccX`Yž'h\Y'i b]j Yfg]hrighUbXUfX'@YUfb]b[A UbU[Ya YbhGmghYa 'f@A GŁ'' =b`UXX]h]cbžcb!`]bY`Ugg][ba Ybhigi Va]gg]cbg`UfY'a UXY'i g]b['h\Y Ugg][ba YbhXfcdVcI 'ZUVJ`]hridfcj]XYX`]b`A ccX`Y'' 5``Ybfc``YX`ghi XYbhg`UfY'Ui hca Uh]VU``m`]bWi XYX`]b A ccX`Y'Zcf`YUVX 'Vci fgY'' Hc`UVWVfgg'h\YgY`XcW a Ybhg`UbX`ch\Yf`Vci fgY`fYgci fWfgžd`YUgY'j]g]h` <u>k k k "a ccX`Y'hY`h'i bgk "YXi "Ui</u>

FZ[e UagdeWagf?[`WeWfe agf VWeUd[bf[a` aXU'SeeWe Sf fZWVSfWfZW5 agdeWA gf?]`W[e bgT?[eZWVžFZW `SfgdWaXU'SeeWe _ Sk UZS`YWVgd[`Y fZWFWd_ SXWdfZW5 agdeWA gf?]`W[e bgT?[eZWVž? aaV WeZag*V TW Ua` eg fWW Xad fZWgb fa VSfWU'See VWeUd[bf[a` ež ;XfZWdW[e S` k [`Ua` e[efW Uk [` fZWVWeUd[bf[a` aX SUf[h[f[We TWfi VWV fZWG` [hWde[fk f[_ WfST*WS` V fZW5 agdeWA gf?]`W/Se gbVSfWW [` ? aaV Wfi fZW VWeUd[bf[a` [` fZW5 agdeWA gf?]`W? aaV WSbb?[Wež

< ck KY7 cbHJWhMci

5 hhļa Ygžih Y GWL cc``cfimci f Webi fgY Webj Ybefgʻa UmbYYX he WebhUWhimei "UVei himei f Webi fgY cfimei f Ybfe`a Ybh'`Mei f Webi fgY Webj Ybefgʻk]```i gY hLY Ya U]``Z bWh]eb'k]hL]b'A ccX`Y`cf`kY`k]``WebhUWhimei "eb mei f 4 ghi XYbh'i bgk "YXi "Ui 'Ya U]``UXXfYgg"

K Y'i bXYfgHUbX'h\Uhimci 'a Um\Uj Y'Ub'YI]gh]b['Ya U]`'UWVci bhUbX'k ci 'X'dfYZYf'Zcfimci f'I BGK 'Ya U]`g'hc VY'fYX]fYWYX'hcimci f'dfYZYffYX'UWVci bh''D`YUgY'gYY']bghfi W1]cbg'cb'\ck 'hc'fYX]fYWhimci f'I BGK Ya U]`g.''<u>< ck 'WUb'=Zcfk UfX'a mYa U]`g'hc'Ubch\Yf'UWVci bh3″</u>

< ck Mci 7Ub 7cbHJWhIg

K Y`UfY`U`k Umg`fYUXmhc`Ugg]ghimci`k]h\`mcif`]bei]f]Yg"`Hc`YbgifY`mcif`eiYgh]cb`]g`X]fYWhYX`hc`h\Y`WcffYWh dYfgcbž'd`YUgY`igY`h\Y`YaU]``UXXfYgg`VY`ck`Zcf.

- 9bfc`a Ybhcf`ch\Yf`UXa]b`ei Ygh]cbg`fY[UfX]b[`mci f`dfc[fUa.`
 <u>\htdg.## bgk]bg][\hta]WfcgcZtWfa dcfhU`g"Wca # YV!Zcfa g#</u>
- 7 ci fgY`]bei]f]Yg`g\ci `X`VY`X]fYWWYX`hc`h\Y`7 ci fgY`7 cbj Ybcf

-a U[Y[·]7 fYX]h

GmbYf[]Yg`]b'GcibX'&\$%*

7 F *=*7 C G

7F=7CG[.]Dfcj]XYf[.]7cXY[.]\$\$\$-,;

5W_bck `YX[Ya YbhcZ7ci bhfm

 $\label{eq:constraint} \begin{array}{l} K_{1}^{T}(UW_{bck}^{T}X_{l}^{T}) & K_{1}^{T}(UX_{l}) \\ F(UX_{l}) & F(UX_{l}) \\ F(UX_{l}) & F(UX_{$

5ddYbX]I. '9b[]bYYfg'5ighfU`]U'f95EDfcZYgg]cbU`'9b[]bYYf'7cadYhYbWm GHJbXUfX

Dfc[fUa +bhybXYX @YUfb]b[Cihwca Yq ? bck `YX[Y 'UbX'q_]``'VUqY D9%"%7ca dfY\Ybq]i Yž'h\YcfmVUqYX'i bXYfqHUbX]b['cZh\Y'i bXYfd]bb]b['bUhi fU`'UbX $d mg]WU^{g}UbX'hY'Yb[]bYYf]b['Z bXUa YbHU^{g}Udd^WUVY'hc'hY'Yb[]bYYf]b['X]gW[d^bYf]gW[d^bYf]b['X]gW[d^bYf]b['X]gW[d^bYf]b['X]gW[d^bYf]gW[d^bYf]b['X]gW[d^bYf]b['X]gW[d^bYf]b['Y]gW[d^bYf]b['Y]gW[d^bYf]b['X]gW[d^bYf]b['Y]gW[d^bYf]g$ D9%"& 7 cbW/dhiU`i bXYfqHUbX]b[cZh\Y`aUh\YaUh\WažbiaYf]WU`UbU`mg]qžqHUh]qh\WažUbX Wca di hYf'UbX']bZcfa Uh]cb'gW]YbWYg'k \]W\'i bXYfd]b'h\Y'Yb[]bYYf]b['X]qW]d`]bY D9%" ===!XYdh\ i bXYfqHbX]b[cZqdYWU`]qhVcX]YqcZ bck YX[Yk]h\]b'h\YYb[]bYYf]b[X]qWd`]bY D9%"('8]qWFfba YbhcZ_bck YX[YXY]Ycda YbhUbXfYqYUfWXX]fYWfcbg'k]h.jb'h.Y Yb[]bYYf]b[`X]gWJd`]bY D9%") ? bck `YX[Y`cZYb[]bYYf]b[`XYg][b`dfUW]WY`UbX`WcbhYl hi U``ZJW/cfg`]a dUWf]b[`h\Y Yb[]bYYf]b['X]qWd`]bY D9%"* 1 bXYfqHJbX]b['cZhXY'qWcdYž'df]bW]d`Yqž'bcfa qž'UWVci bHJV]`]h]Yq'UbX'Vci bXq'cZ qi qHU]bUV`Y`Yb[]bYYf]b[`dfUWfWY`]b`H\Y`qdYWZ]WX]qW[d`]bY 9b[]bYYf]b['Udd`]WUhcb'UV]`]hm D9&"%5dd`]WUhjcb`cZYgHUV`]g\YXYb[]bYYf]b['a Yh\cXg`hc`Wca d`YI 'Yb[]bYYf]b['dfcV`Ya qc`i]b[D9&"&: `i YbhUdd`]WUhcb'cZYb[]bYYf]b['hYWkb]ei Ygžhcc`g'UbX'fYgci fWfg D9&"' 5dd`]WUhjcb'cZgmghYa UhjWYb[]bYYf]b['gmbh\Yg]g'UbX'XYg][b'dfcWYggYg D9&"('5dd`]WUhjcb'cZgmghYa UhjWUddfcUWXYg'hc'h,Y'WcbXi WhUbX'a UbU[Ya YbhcZYb[]bYYf]b[dfc YWg DfcZYgg]cbU`UbX dYfgcbU`Uhf]Vi hYg D9' "%'9h\]WU``WcbXi WhUbX'df]Vi hYa