KSPLORAI PMEDRTKOENMGCSI NEESKUKOI SI I GEOI O- JOMGNI PE(I OI GENRO TKGCI GENKSGMSECOD)*GENERALIZED LINEAR MODELING*EE

amb nmgHEr mydmi sE
ursran Teki $Tp$$HEnir,UnaTeki $FTv $NksaSUnaTgkmks$pk(nsn mEvgg) pGT
dk4r mT) KFF5n(IraTpkinsn Tdr r mlnU$pk(nsn mT0299. FEek,I 8E29KG1021L29T

Abstract: *TheoTbj cotivsofTbpTeoTr rofouifTf idywTaxf TbTol rmbroT- xieo- xivtxnTF byomTexiTbdmyTj oT dfoyTibTofiv- xioTieoTud- j onTbpTxttwyouifTbuTuiondrj xuTibmTrbxyfFTgmoyivsoT- byomTaorroT yosorbr oyTj wTromxivu(TinxpotTol rbfdroT)xsomx(oTyxvmTinxpotTxuyTrbxyTfotivbuTmou(ieATavieTieoT ud- j onTbpTxttwyouifTrorTduvTbpTiv- oP,ttwyouiJTrbxyaxwTfotivbuTxuyTinxpotTsbrd- oTyxixTaorroT bj ixwoyTprb- Tkx(bnxavJTkxCxrix.zvCx- roCJTrxyxmduwJTxuyTrxmCxutvTibmTrbxyFT,ttwyouiTnxioT - byomTaorroTyosorbr oyTprb- TebfoTyxixTdfvu(T(ouonxmqoyTmuoxnT- byomu(TEdMP GTot euv dofFTheoT tbutrdfvbufTprb- TieoTf idywTaorro1T)2ATmuvonTro(roffvbuT- byomTaxfTubiTxrrbrnxioTibTj oTdfoyTibT rroyvtiTxttwyouifTud- j onTj otxdfoTxttwyouiTbttdroutoTywTubiTpbmTaTubn- xmTyvfinjdivbuJT)3AT gbvffbuTro(roffvbuTrbffoffoyTxttwyouiTbttdroutoTexnxtionfivtfTyoftrnioJTnxroTxuyTnxuyb- JTxuyT)NATBo(xivsoTLvub- vxmTyvfinjdivbuTaxfT- broTxrrrbrnxioTibTrorrofouiTxttwyouiTbttdroutoT reoub- oubuTavieTbsonyvfrorfvbuFT*

Keywords: *TxttwyouiTnxioJT(ouonxmqoyTmuoxnT- byomu(JTgbvffbuTro(roffvbuJTux(xivsoTj vub- vxmT ro(roffvbuFT*

I ntkymuEbk k,$$$n TS$Tj ks$Uon Tr UiT(k mkial,ysnaST(y4k,T(nUk(nU$aThn mT4nlnUT4$nr nin T r UiT(ksn(n,in Tor(,ncTikwk,ninn FTIn4nTarnUTsrnaTon,n TUy,Tn UnsTiyUn8TPy4k,TIsk4$aST 4$k(jn min T4k mn T(k mcrjr min TlnInsn T,n,r,SUnaFThn mT4ShnUnin T4k mn TNy,r(kT ,n,r,SUnaT4n Tn on mTsrnaTon,n FT4k mn Tikak,n(nUn FThn mT4ShnUnin T4n,n(Tor(,ncTikwk,ninn T IksTanUn TDniUn8T- nUnTon,n FTikwk,ninn FT4n T,n,r,SUnaTak,n(nT4rnTUncr FT4$n(j$T4ns$Ton,n TUy,T n UnsTiyUnTunmysnD$FTuninsUnC$$n(IkiFTbn4n,kr h$T4n Tbn,$n w$$TPy4k,TU$minUTikwk,ninn T 4$k(jn min T4ns$T4nUnTUksakjrUT4k mn TUki $T(*ouonxmqoyTmuoxnT- byomu(*TEdMP GTT4n T4$n,$snaST 4k mn T(k mmr nin TUki $CUki $TaUnU$aU$8T:kjksnlnTika$lr,n Thn mT4nlnUT4UnsT4ns$T Ik k,$$$n TS$Tn4n,nc;TELGTPy4k,TskmskaTSks$T4k mn T4$aU$$raST ys(n,TU$4niT(k(n4nSTr UiT (k(Isk4$aSTikwk,ninn 3TU$minUTikwk,ninn TU$4niTUksjriU$T(k mrUT4$aU$$raST ys(n,3TE9GT bk mmr nn Tskmska$TbySay T,kj$$T(k wks(Sin TinsniUksaUTikon4$n Tikwk,ninn ;T4$ais$$FTnwniFT ,n min3TT4n TEEGT- $aU$$raST: Sy($n,TgkmnU$FTIn,SmTjn$T(ksklskak Una$n Tikon4$n Tikwk,ninn T 4k mn Tn4n hnTnkon,n*TbsonyvfrorfvT*n4nT4nUn8T

SmkmEcg2suU$minUTikwk,ninn FT(*ouonxmqoyTmuoxnT- byomu(*FTskmska$TySay FTskmska$Tj Sy($n,TT
[redacted] kmnU$8T

LKGTI r - O- I GE

eSminUT5kwk,ninn TEe5GE*xttwyouiTnxio*GT n4n,ncTIksan(nn T(nUk(nU$aThn mT(k hnUnin T crjr mn Tn UnsnTHhiUysGhiUysT4y(Sn Thn mT (k(Ik mnsrcST ikwk,ninn 8T -k mn T (k mmr nin T $nST Te5T(k(r miSin TiSUnT (k,nirin TIksjn 4Smn TU$minUTikak,n(nUn T n UnsTjksjnmn$T,yinaSThn mTjksjk4n8TRn,TSST 4$ r miSin T 4k mn T wnsnT (k ys(n,$anaST or(,ncTikwk,ninn Thn mTUkson4$T4$TarnUTsrnaT on,n T4k mn TIks$y4kTDniUnFTIn on mTsrnaFT4n T Ny,r(kT,n,r,SUna8TpkjnmnSTmn(jnsn FTnInj$nT arnUTsrnaTon,n T(k(Ir hn$Tjn hniTikwk,ninn T 4n Takin,$nraT (k(Ir hn$T Ny,r(kT,n,r,SUnaT hn mT an mnUT jkansFT srnaT UksakjrUT j$anT (k(Ir hnSTe5Thn mTikw$T4n Ty,kcTakjnjT$UT 4nlnUT4$nUkmys$n T,kj$$Tn(n T4$n 4Smin T srnaTon,n T,nST4k mn Tor(,ncTikwk,ninn Thn mT ,kj$$Tak4$$$UkUnI$T4k mn TMRVTEn,r,SUnaTcns$n T snUnGnUnGThn mTonrcT,kj$$Tsk 4nc8Te5Tj$nan hnT 4ShnUnin Takjnmn$Tksjn 4Smn Tn UnsnTor(,ncT ikwk,ninn T 4$nmST 4k mn T or(,ncT In on mT Ikson,n n TnUhrTsoevtra.C- TnxsomyTEQ5eGBT

: nmSh Tl k U$mT4n,n(Tl k $hSh TskaSyT ikwk,ninn Tn4n,ncTS4k U$$naSTrirsn Tlnlnsn T EolrbfdroGThn mTUklnUTUkscn4nlTskaSyThn mT ak4n mT 4$noST E&SFT kUT n,FT 9220GBT ur(,ncT Ikson,n n TnUhrTlnlnsn TT(k r oriin Tk,rn mT Ukson4ShnT (naSmC(naSmT ikwk,ninn T Epnwwy(n yTAT: rhwyFTL. 11GBT6sraT,n,r,SUhaTT (ksrlnin Trirsn Tlnlnsn Thn mTln,SmTr(r(8T PSan, hnFTlk mk,y,nTon,n TUy,TTbeTunan(nsmnT (k(lr hnST Uy,yiT rirsT ikak,n(nUh FT hnSUhT U$minUT ikwk,ninn T Ee5GFT 4k mn T 4kH$SaST akjnmnST jks$rUT $hG = \frac{kG \times 2KKcdixTcbuyxnxxu}{HR0 \times H \times cd- mxeTexnv}$ T

-$ n nTu5Tn4n,ncTor(,ncTikwk,ninn FTMRVT n4n,ncT,n,rT,SUhaTcnsSh TsnUhGnUhFT4n TMTn4n,ncT In on mTsrnaTon,n 8T

5kirsn mn T4nsSTlk 4kinUh TSSTn4n,ncT nar(aSTn4n hnTcrjr mn T,S$ksTn UhsnTor(,ncT ikwk,ninn T4k mn TQ5e8Tbn4nTik hnUhn hnT Uks4nlnUTjriU$TjncDnTcrjr mn TUksakjrUTUniT ,SksFT4n Thar(aST,S$ksShaT(k,k(ncin ThirsnaST lsk4$aSTikwk,ninn TE&SFT4ii8FT9220GBTpkjnmnST n,Uks nU$FT lks,rTkial,ysnaSTjk UhiTcrjr mn T n UhsnTor(,ncTikwk,ninn T4k mn Tor(,ncT4n T In on mTlkson,n n TUh lnT4Sanr(a$n TakwnsnT nlsSysSTn4n hnTcrjr mn T,S$ksTn UhsnTor(,ncT ikwk,ninn T 4k mn T EolrbfdroGT lnlnsn T lkson,n n TUksakjrUT4k mn T(k mmr nin T4nUhT niUhn,8Ter,San TSSTjksUhon Tr UhiT(k minoST crjr mn Tn UhsnTor(,ncTikon4Sh Tikwk,ninn T 4k mn TNy,r(kT,n,r,SUhaTcnsSh TsnUhGnUhTEMRVGBT eks(nariT4S4n,n(hnTn4n,ncTinoSh T(k mk nST nar(aST4SaU$raSy n,T4n Tjk UhiTHl maSy n,8T

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DKNRTRORCMEKGKOMMMGE

T bk(y4k,n T(nUk(nU$aT n4n,ncTUki $T r UhiT(k(jrnUT(kUy4kTirn U$$hjk,Tr UhiT (k(lsk4$aSTUkson4ShnTikon4Sh TUksUk Uh8TPy4k,T lsk4$aSTikwk,ninn Tn4n,ncTlksan(nn Thn mT (k hnUhin T Hkirk aST ikwk,ninn T akjnmnST Hl maST4nsSTnsraT,n,rT,SUhaT4n Tinsni UksSaU$Ton,n T hn mT,nS8T: n hniTSarThn mT(r wr,TjksinSUh T 4k mn Tl k(y4k,n T(nrlr T4k mn TaSHnUT4nnsST ikwk,ninn T,n,rT,SUhaTSUhTak 4S$8Tpkor(,ncTSarT lk U$mT4$ncnaT4n,n(TjnmSh Tjks$rU8T

E d MP T EMouonxmqoyT HuoxnT β byomu(AT (ksrlnin T(kUy4kThn mTln,SmT,n mar mThn mT 4Snr nin T r UhiT (k mk(jn min T (y4k,T (nUk(nU$a8T d MP T jShan hnT Uks4S$T 4nsST U$mT iy(ly k ;T iy(ly k T sn 4y(FT iy(ly k T aSaUk(nU$FT 4n T Hl maST lk mcrjr mT hn mT (k mcrjr min T 4rnT iy(ly k T r UhiT (k mcnaS n Tlsk4$UysT,S$ksTEMys4TATbksanr4FT 9222GBT6ar(aSTlk U$mTn,n(Tlk(y4k,n T,S$ksT Uksmk ksn,SanaST n4n,ncTjncDnT nxuyb- T orrbnT Ukson4STcn hnTln4nTNhsShjk,TUks$nUT4n TjncDnT NhsShjk,GNhsShjk,TjkjnaT4$kUhcrSTUh lnTorrbnT EPncksTATpr((ksamS,FTL..IGBTOST(ksrlnin T nar(aSTlk U$mThn mTcnsraTak,n,rT4$kscnU$n T insk nTU$niTak(rnTNhsShjk,Thn mT4$ks,rin T hn mTjksiy U$raSTln4nTikwk,ninn Tik 4nsnn T 4$kUhcrSTUh lnTorrbr8Tv UhiTNhsShjk,Tmky(kU$T 4n Tiy Uy,TaklksU$or(,ncT,norsT4n Tikjksn4nn T (k4Sh FTNhsShjk,TSST4$kUhcrSTUh lnTorrbrFTUkUhlST U$niT 4k($Sh T 4k mn T ak(rnT NhsShjk,T insni UksSaU$T ,n,rT ,SUhaT aklksU$T Ny,r(kT 4n T lksak Tk 4nsnn TjksnU8T

T bSSn T 4SaU$raST lsyjnjSShaT 4n,n(T d MP TH;kia$k,Tr UhiTiy(ly k Tsn 4y(FThn mT (k(jrnUT(y4k,TSSTkHkiU$FTr UhiTikak,n(nUh T ,n,rT ,SUhaT 4$ n nT or(,ncT ikwk,ninn T 4n T NhsShjk,T,nST(k mrUT4SaU$raSTbySay TnUhrT jSy(Sh,T kmnU$FT 4n T NhsShjk,T hn mT ,nST (k mrU4SaU$raST ys(n,8T

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Dei l 4EOsgsl yE

T pkwnsnT cSaUysSaT (nhysSUhaT l k k,SSh T Uk Uh mTcrjr mn Tkwk,ninn Tn,rT,SUhaT4k mn T HmiUysTl k hkjnj hnFTakl ksUST(San, hnTNy,r(kT ,n,rT,SUhaFT(k mmr nin Tn n,SaSaTskmskaST,SSksT iy Nk aSy n,FT hn mT (k mnar(aSn T jncDnT NhsShj k,TUksSnUTn4n,ncTy USh rT4n Tjks4SaUSSraST ys(n,T 4k mn T NhsSh T *ombn*T iy aUh 8T bn4nT r(r(hnTiykHSaSk TskmskaST4S4nl nUUn T4k mn T (kUy4kTirn4snUT Uksi kwST Ush4SaSy n,T *Ebnywuxnwt maxfiTf: dxmf* GST P kUy4kTSST(k mcnaSn Tr*buiT ofiv- xibnUT!* FThn mT(k(l r hnSTNhsSh T(SSr(8T bk 4kinUh Tn n,SaSaTNhsSh TE6gσQ6GTjShan hnT 4Shr nin T4n T(k(Sancin T*fd- TbpTf: dxmf*T Eor(,ncTirn4snUGT4n T4ksnon4Tikjkjnan Thn mT jksinShh T4k mn TNhsShj k,TUksSnUSTβ *oxuTf: dxmyT ombn*FT P p) FT4nl nUT4Sksy,kcT4nsSTUhj k,T6gσQ6T 4n T(ksrl nin TUhi aSn TNhsSh TE[9]GTUhiQSha8T QnsSh T*ombnTion- f*TE.gGTor mnT(ksrl nin TS4SnaST NhsSh T4nsST4SaUSSraST syj nj SSUhaTNhsShj k,TUksSnUST

T QnsSh T 4Shr nin Tr UiT (k mcSU mT iykHSaSk T 4kUks(SnaSFT V[9]FT hn mT (kskl skak UhaSn Tl syl ysaST NhsShj SSUhaT hn mT 4Sk,nain T y,kcT Hl maST skmskaSST 5ykHSaSk T 4ksUks(SnaST(ksrl nin T(kUy4kThn mTl n,SmT r(r(Tr UiT(k k Uin Tirn,SUhaT(y4k,Thn mT 4SwnsST4n T(k(l r hnSTsk Uh mT ShST n UhsnT y,T 4n T anUr8T gShST V[9]T (k 4kinUST y,T (k mS4SnaSn TUS4niTn4n hnTcrjr mn T,SSksT hn mTirnUTn UhsnTNhsShj k,Tj kj naT4n TUksSnUST gShST V[9]T (k 4kinUST anUrT (k mS4SnaSn T ikwywyin T,SSksT hn mTirnUT 4S n nT (y4k,T (k ok,nain TNhsShj SSUhaTl n4nT4nUh8TV[9]TcnsraT 4Shr nin T4k mn TcnUSScnUSTr UiT(k on(ST SUksl skUhaST hn mT j k nsT 4n T 4Shmjr min T 4k mn Tl k(ksSnann T4k mn T4Shmsn(Tl k wnsT nUhr T*ftxiionTr mi*TEd nsj ksTAT) cscnsUFT9222GST V[9]T (ksrl nin Tl nsn(kUksThn mTj ks(n HmnUTcn hnT 4n,n(T(y4k,TskmskaST,SSks3TShTUS4niTnl ,Snj k,T l n4nTinar aT,nSTak,nST4SaUSSraST ys(n,8TgShSTV[9]T hn mTsk 4ncTUS4niTcn hnTjksnsUST(y4k,TUS4niT wywyiTr UiT4nUhThn mTjksan mirUh FTUkUhl STor mnT US4niT n4nT crjr mn T,SSksT n UhsnT NhsShj k,C NhsShj k,T hn mT 4SnoST 4n T cnsraT 4Shr nin T j k UiQk UiTHl maShUhrT4SaUSSraShn mT,nS 8T

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Al HyUl tsELesttegE

: kj ksnl nT l k k,SST l kswnhnT jncDnT iykHSaSk T(y4k,Tl sk4SaSTikwk,ninn TUS4niT4nl nUT 4k mn Tjk nsT4ShiaST4k mn T(kUy4kTskmskaST irn4snUCUksi kwST jShanT nUhrT irn4snUCUksi kwST Uksj yj yUSTRn,TSST4Snsk nin Tor(,ncTikwk,ninn T jksaShUT 4SaisSFT y CkmnUSFT 4n Tik hnUhn T jncDnT NhsSh T or(,ncT ikwk,ninn T (niST (k(jkansTakSSmT4k mn Tak(niSTjkans hnT nsraT,n,rT,SUhaTUkUhl STUS4niTakwnsnT,SSksTEMys4TAT bksanr4FT9222GSTTP y4k,TskmskaST ys(n,TnUhrT ,ym ys(n,Tiy Nk aSy n,TUS4niT(k(SSSTaShUCaShUT aUhUSaUSaThn mT4Sks,rin Tr UiT(k 4kaisSaSn T ikwk,ninn Tik 4nsnn 8TP nan,ncTrUh(nT4k mn T l k(y4k,n T,SSksY r,USSSksTn4n,ncTjncDnT(y4k,T SST(k(l r hnSTik(r miSn Tr UiT(k(l sk4SaST ikwk,ninn T kmnUSFT 4S n nT US4niT (r miST Ukson4ST4n,n(Tik hnUhn TEP ShyrT*oiTxm*FTL..9GST prnUrT,yinaSTUh l nTikon4Sh Tikwk,ninn T4nl nUT Ukson4SFTUkUhl STUS4niTn4nT,yinaST4k mn Tor(,ncT ikwk,ninn T kmnUSST Rrjr mn T n UhsnT ikwk,ninn T4k mn THmiUysCHmiUysThn mTjksinShh T US4niTak,n,rTskH;kiaSTksShirT,SSksThn mTjksniSnUT skmskaST(r,USC,SSksTUS4niTUkl nUTr UiTn n,SaSaT akjnjGakjnjT ikwk,ninn T Epnwwy(n yT AT : rhwyFTL. 11GSTT- ST,nSTl SniFT4k mn Tak(niST (r4nc hnT l symsn(T l k(y4k,n T 4ShiakaFT wn mmST4n T*dfonTpouym*FTl nsnTl k k,SST(r,nST (k niaSSTykHSaSk T(y4k,T4k mn T(k mmr nin T (kUy4kT *- xlv- d- .m(ombby*T T Eikwywyin T (niaSr(GTr UiTin,SsnaST(y4k,C(y4k,T,SSksT Uksmksn,SanaST E(*ouonxmqoyT muoxnT - byom*GST bk mmr nn TU$kT4SaU$$raST,nSTormnT(k on4ST ak(niSTIy,r,ns8TbS$n T(y4k,Thn mT4SarinST n4n,ncT4SaU$$raSTbySaay 8TbS$n THI maSTakarnST 4k mn T aSmUT ikwk,ninn T n4n,ncT HI maST kialy k aSn,FT 4$ n nT ar4ncT akwnsnT ,rnaT 4Smr nin T y,kcT aUnUaUnDn T 4n T kiy y(kU$$nDn TEP SnyrToiTxn8FL..9G$T

T VkmskaST bySaay T n4n,ncT arnUrT Ik 4kinUn T Ik(y4k,n T y ,S$ksT 4$ n nT NhsSnjk,TUks$nUhnTn4n,ncTcSU mn TEtbduiGFnUrT ikon4Sn T4SaisSUThn mT,n minTEgnUksToiTxnFFL...G$T -nUnTcSU mn TUk,ncT4Sn n,SaSaT4k mn TskmskaST ,S$ksTjSnanFTUkUnISTn4nTikr Ur mn T4k mn T (k mmr nin T skmskaST bySaay T hnSUT 4nsST ik hnUnn TjncDnT4SaU$$raSTSST4Smr nin TnUnrT 4Sn wn mTr UriT4SaU$$raSTNhsSnjk,TUks$nUT4SaisSUT 4n Thn mTaksSmin,San mnU(k wk mTEfCoaoyG$T

T -SaU$$raST bySaay T (k(y4k,in T IsyjnjSSmaT ikon4Sn T 4SaisSUT 4k mn T

$$g)=A=\frac{o^{-\mu}\mu^{=}}{=Y}$$ 8T4n T4nInUT4SUsr in TakjnmnST

,$ $UT4SaU$$raSTjSy(Sn,T4$ n nTor(,ncTr,n mn T EnxrGFT FT(k 4kinU$UniCcSmmnT4n TIsyjnjSSmaT ariakaT U$IT r,n mn FT IFT (k 4kinU$T y,T ak4k($Sn TsrInTakcSmmnTurλ]TEVSnkFTL.11G$T -$ n nTμTn4n,ncTor(,ncTikon4Sn TIn4nTIksSy4kT hn mT4S8T4n T'Tn4n,ncTor(,ncTsnUnGnUnT ikon4Sn TIn4nTIksSy4kThn mT4S8TPy4k,T skmskaSTbySaay T(k mnar(aSn TjncDnTor(,ncT ikon4Sn TsnUnGnUnT(ksrInin THI maSTNhsSnjk,C NhsSnjk,TskmskaysTv UriT(k niaSTHkirk aST ikwk,ninn FT SnT 4Snar(aSn T jks4SaU$$raST bySaay T 4k mn T

$$g)==_vA=\frac{o^{-\mu)[\,_v\beta A}\mu\mu_v)[\,_vJ\beta A\bar{X}^v}{=_vY}$$ 8T μ_ST an(nT

4k mn Tor(,ncTikwk,ninn TIn4nTsrnaTon,n T'S$T r UriTIksSy4kTDniUrThn mT4S8TXTn4n,ncT NkiUysTInsn(kUksThn mT4SmiaS$T $E_vT\lambda E)[\,_vJ\,A$T n4n,ncTor(,ncTikwk,ninn TsnUnGnUnTIn4nTsrnaTS$T

hn mT(ksrInin THI maST4nsSTanUrTakUTNhsSnjk,T jkjnaTλ8TλSTn4n,ncTNkiUysTNhsSnjk,TjkjnaTr UriT srnaTS$Tr maS$T $E_vT\lambda E)[\,_vJ\,A$FThn mT(k mcrjr min T sksnUnT4SaU$$raSTIn4nTNhsnSnjk,TjkjnaFTn4n,ncT HI maSTIk mcrjr mT $E_vT\lambda TE)[\,_vJ\,A\backslash o^{[\,_v\beta}$ 8TQnsSnjk,T jkjnaTn4n,ncTSUk(GSUk(TakIksU$TnsraT,n,rT,SUnaT 4n TinsniUksSaU$TmkY(kU$$8TQkiUysT βFThn mT Uks4S$T4nsTNhsSnjk,Tjkjna T(k(Ir hnST SnSTLT akjnmnST HmiUysT Eon- GTIksUn(n hnTakcSmmnT HmiUysT IksUn(nT 4n,n(T NkiUysT fT n4n,ncT SUksakIUysTnUnrTiy aUn 8T6InjSnT,yinaSThn mT 4$ncSTjksrInTarnUrTn on mTon,n FTjrin TjksrInT Iksa$ In mn FTjSnan hnT4Snar(aSn TjncDnTE_vT ormnTIsylysaSy n,TUkscn4nITIn on mTMST(nrIr T Ukscn4nITIksSy4kTDniUrFTakcSmmnT=STn4n,ncT 4n,n(Tjk UriTikwk,ninn TIksTiSy(kUksTIksT Uncr 8T

T pnUrT(nan,ncTrUn(nTn4n,ncTHk y(k nT yNks4SaIksaST 4$ n nT nar(aST aUsriUrsT ornbnT bySaay T(rs ST4nInUT4SnUTU$niT(k(n4nS$T Py4k,TjSy(Sn,T kmnU$FTaksSmT4$S$8Tr UriT (k mnUnaST(nan,ncTSSTakjnmnSTkiaUk aST4nsST (y4k,TbySaay 8TekUnISTaksSmin,STNhsSn T,kjS$T jkansT4nsSTsksnUnTUkson4ST4Sakjnjin TakjnmSn T insk nTU$niT4$ nariin hnTak(rnTNhsSnjk,T hn mTsk,kNh TikT4n,n(T(y4k,TE5 r$ n ToiTxnFT L..fG$T:SnThn mTUkson4STNhsSn T,kjS$TjkansT 4$n 4Smin T4k mn TsksnUnTcn,TSST4SakjrUT 4k mn TyNks4SaIksaS$T

E

AI HyI tsEasgeb sm4EGI HmksEE

T -SaU$$raSTjSy(Sn,T kmnU$FT(ksrInin T kiaUk aSTn,n(SncT4nsST4SaU$$raSTbySaay FThn mT (k(IkscSU min TNhsSnjSSmaThn mTjks,kjS$n T hn mTin4n mT4SUk(rin T4n,n(T(y4k,TIsk4$aST ikwk,ninn 8T-SaU$$raSTSST(r,nST4$ SnU$Tr UriT 4Smr nin T 4n,n(T Ik k,S$Sn T Unn alysUnaS$T 4Smr nin Tr UriT(k(jn UrT(k mnUnaST(nan,ncT hn mT Ukson4ST 4k mn T Ik(y4k,n T bySaay FT

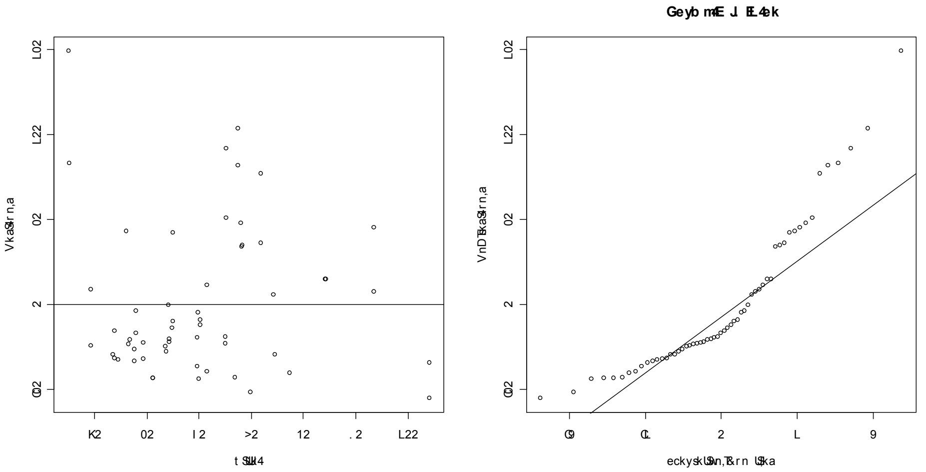
922f

E

anUr TUSSS T(k hkjnsTonr cT4nsShn mT,nS T n4nT Sn ST L028T

*Bbn- xnTi: dxuivnoTr nbi*Tr UriTikwk,ninn T UyUn,FTl n on mTsrnaT4n TMRVT4SU oriin Tl n4nT dn(jnsTLEj C8Td nsSaT,rsraTl n4nTdn(jnsTLEj GT (k r oriin T ys(n,SUnaTak4n mTmsSaTjksrl nT USSSCUSSST(kskl skak UnaSn T4nUnTniUn,8T- nsST

mn(jnsTUks,SnUTn4n hnTk h$ l n mn T4nsST4nUnT Ukscn4nl T ys(n,SUna8T bn4nT jnmSn T nDn,T l k h$ l n mn T n4nT 4ST jnmSn T nUnaT mnsSaT ys(n,SUnaT ik(r4Sn T jksn marsT Ursr T (k h$ l n mT4STjnmSn TjnDncTmnsSaT ys(n,SUnaT 4ST jnmSn T Uk mn T 4n T ik(r4Sn T n$ T ,nmST (k h$ l n mT4STjnmSn TnUnaTmnsSaT ys(n,SUna8



T

T EnGT EjGT

Cmb nmyE 8EEnGg SnST sk4$ aSTNa8Tska4rTr UriTkwk,ninn TUyUn,FTl n on mTsrnaT4n TNy,r(kT,n,r,SUnaFEj Gg ys(n,T zrn USkT,yUTr UriTkwk,ninn TUyUn,FTl n on mTsrnaT4n TNy,r(kT,n,r,SUnaT4k mn TskmskaST,SSksS8T

Deil 4ELesttegT

E Py4k,EskmskaST,SSksTjks4nansi n Tl n4nT nar(aST 4SaUs$ raST ys(n,T hn mT (ksrl ni n T 4SaUs$ raSTi y US hr8TRn,TSST(k on4STn,nan Tr UriT (k,nirin Tkial ,ysnaST Ukscn4nl T4SaUs$ raST,nST insk nT4nUnTikwk,ninn T,n,r,SUnaTl n4nTarnUrT srnaT on,n T l n4nT lksSy4kT DniUrT UksUk UrT (ksrl nin T4nUnTcSU mn TE*tbdui*GT4Sai sSST y C kmnUSFThn mTUS4niT(k mSrUST4SaUs$ raST ys(n,8T

σ,kcTinsk nTSUT4SaUs$ raSThn mTjks4nansi n T *t bdui Tyxix*T4S noSTik(r miSn T,kjSSTUkl nUTr UriT (k(l sk4$ aSTor(,ncTkwk,ninn 8T

tr maST*(m T)(ouonxmqoyTmuoxnT- byon*GT 4nsSTl ksn minUT,r ni TVT4Snr nin Tr UriT*piiu(*T (y4k,T bySaay T crjr mn T n UnsnT σ(,ncT ikwk,ninn TUyUn,T4k mn Tl n on mTsrnaT4n T ,n,r,SUnaTcnsSn TsnUnGnUnTEMRVGST VSminan T 4SanoSn Tjks$rUTSST

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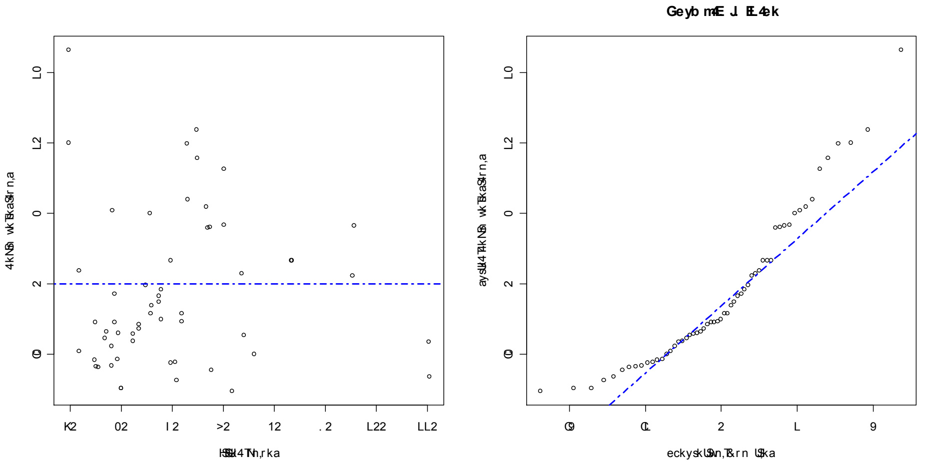
BykHHSVSk Ua;T
TTTTTTTTTTTTTT     ) aU$ nUkTT     pU48T) ssysTT        <TNh,rkTT        bsEj *<*GTTTT
EOUkswkl UGTTf 802fk722TTT  0899KkC29TTT       l >82lf TTT    ' T9kCLl TqqqT
bn on mTTTTT>8>.9kC29TTT  0892KkC2f TTT       LK8 >f TTT     ' T9kCLl TqqqT
,csUTTTTTTTT    98 99kC2l TTT   08 f KkC2>TTTT      K8KL. TT     . 8 f kC2l TqqqT
pSn S88By4kaT        ;T2Tqqq'T2822LTqq'T2822LTq'T2820T8T28LTTTLTT
gr,,T4kNSn wkT       ;TL1. L8 Ty  TOl TT4kmskkaTyHSkk4y( T
VkaS4rn,T4kNSn wkT;TLl >>8 Ty  TOKT4kmskkaTyHSkk4y( T
6OBT                 ;T922K8>T
```

Py4k,Thn mT4SnaS n Tn4n,ncT$Hu_{)hbixmA}TAT$ $NP9KN7KPK^{**}+3)_{gxuαu(A}7KPKKKKK3S33)_{HR0A}$FT nUnr T $hbixm = o^{NP9KN} 8o^{KPK^{**}+3)gxuαu(A} 8o^{KPKKKKK3S33)HR0A}$T

6ar(aST4nansT4nsST4SaUs$ raSTbySaay T n4n,ncTn4n hnTikan(nn T SnST sksnUnT 4n T NnsSn 8T Py4k,T hn mT 4S k(jn min T 4k mn T (k mmr nin T4SaUs$ raSTbySaay T(k r oriin T SnST yNks4SaI ksaST hn mT jkansFT 4$ n nT

(ksrI ni n T S4$naSTj ncDnT $hST sksnUhT onrcT j ksj k4nT4nsST $hSTNhsSh 8TRn,TSST(k,n mmnsT nar(aST hn mT I n,SmT 4nans8T - nsST i k,rnsn T I ksn mi nUT,r ni TVT4SnUhaT(k(I ks,SnUn Tmkon,nT yNks4SaI ksaSThn mTj kans8Tg $hSTrof ydxnTyosxut oT n4n,ncTLI >>8 T4k mn T0KT4ksnon4Ti kj kj nan T (k(j ksSn T snaS yT yosxut oT 4$nmST 4ksnon4T i kj kj nan T akj kansT f L82>FT akj rncT n mi nT I ksj n 4Smn T hn mT j kans8T g $hST anUT (k mS4$naSn TU4ni T n4nT(nan,ncT4k mn T yNks4SaI ksaSTak(ni S Tj kansT $hS hnFTak(ni S T j kansTI r,nTI ksj k4nn T $hSTn UhsnTsksnUhT4n T

NhsSh 8TRn,TS STormnT(k mS4$naSn Tj ncDnT4nUhT U4ni Twywyi T4k mn Tk SaTHI maS4nsST(y4k,8T T - nsST i k,rnsn T I ksn mi nUT ,r ni FT Dn,nrI r Tak(rnTNhsShj k,TaSn S$n TI n4nTUhsnFT ,kj SST4nsST. 0TI ksak FTUkUhI S4nI nUT4S,SnUTn4n hnT i k(r mi S n T $hSTi ykHSkS TI n on mTsr naT4n T MRVT4nI nUTan(nT4k mn T y,8Td nmnan Tj ncDnT Ny,r(kT4n TI n on mTsr naTU4ni T(k(I r hnST I k mnsrcTI n4nTor(,ncTi kwk,ni nn Thn mTUkson4SFT j ks4nansi n TI k mn(nUh FT(ksrI ni n T4kThn mT ar,SU4SUks$ n8T5nsk nTnar(aST(y4k,TU4ni Tj k nsT crj r mn TSSSNh,S48TT



EnGT EjGT

Cmb nnyE38TEnGg $hST sk4$aSTNa8Tska4r FT4n TEj GEbn- xnTdxuivoTrbiT UdiTkwk,ni nn TyUh,FTn on mTsr naT4n T Ny,r(kT,n,r,S UhaT4k mn Tskmska$byS ay 8T

Dei I 4Ea sgeb sm4EGI HmksE

T tr maST(ouonxnqoyTmuoxnT- byonTr UdiT j S y(Sh,T kmnUSTE(mRuj G4nsST ksn mi nUT,r ni TVT r UdiT (k wywyi i n T(y4k,Tj S y(Sh,T kmnUST crj r mn T n UhsnT i kwk,ni nn T yUh,T 4k mn T I n on mTsr naT4n TNy,r(kT,n,r,S Uha8TVSmi nan T ,r nsn hnTh4n,ncTakj nmnS j ksSr U8T

T bk mmr nn T4SaU$ r aSTj S y(Sh,T kmnUST r UdiT (k(y4k,i n T I n on mT sr naFT Ny,r(kT ,n,r,S UhaT 4n T i kwk,ni nn T yUh,T (k mnUhaST (nan,ncTyNks4SaI ksaSTP y4k,Thn mT4SnaS n T (S$T4k mn T(y4k,Thn mT4SnaS n T4k mn T

4SaU$ r aSTbyS ay FTUkUhI ST(nan,ncTyNks4SaI ksaST cn(I STakI k r c hnT4nI nUT4SnUhaSTg $hSSUksakI T 4n Ti ykHSkS Tr UdiTI n on mTsr naT4n TNy,r(kT an mnUT (S$FT UkUhI ST k,$ SnaST (nan,ncT yNks4SaI ksaST(k(j rnUT4nUhT,kj SSTwywyi T4k mn T 4SaU$ r aST S SST g $hST 4kNSh wkT 4$nmST 4k mn T 4ksnon4T i kj kj nan T n4n,ncT L8Lf f 9>1FT (ksrI ni n T $hST hn mT an mnUT i kwSFT (k on4$n hnT(y4k,Thn mTan mnUTj nmraTr UdiT NhsShj k, hn8T g $hST akj kansT L82T (k r oi i n T U4ni Tn4nT(nan,ncTNhsSh T,kj SSTj kansT4nsSTI n4nT hn mT4SSSi n 8T

BykHSkS Ua;T				
TTTTTTTTTTTTT	) aU$ nUkTT	pU48) ssysTT	<TNh,r kTT	bsEj *<*GTTTT
EOUkswkI UGTf 8K. Lk722TTT	98>f 9kC2LTTT	L98>>I TTTT	' 9kCLI TqqqT	
bn on mTTTTT>80. LkC29TTT	f 899LkC29TTTT	98f 0>TTTT	282L1KTqTTT	

,csUTTTTTTTT f 8L21kC2I TTT f 8910kC2I TTTT 28 KI TTTT 28f KK9TTTTT
gr„T4kNSn wkT ;T >8>f KTTy T0I T4kmskkaTyHFskk4y(T
Vka84rn,T4kNSn wkT;T L8L. >Ty T0KT4kmskkaTyHFskk4y(T
6 0B T ;T0>K8>0T

QnsSnj k,T I n on mTsrnaTaSn $$Sn TI n4nT ,kNk,T . 0T I ksak FT UkUnI ST NhsSnj k,T MRVT U$ni T aSn $$Sn 8T pkj nmn$ n nT4k mn T(y4k,Thn mT 4$k(j n min T4k mn T4SaU$ raST bySay FTj n$T iykHSaSk T I n on mT srnaT (nrIr T MRVT (k(I r hnST I k,rn mTr UriTj ks $nST y,8TP y4k,FT j n$T4k mn T(k mmr nin T4SaU$ raST bySay T (nrIr T 4SaU$ raST kmnU$FT j Sy(Sn,T U$ni T (k(j ks$n T (kUy4kT hn mT j n$T r UriT (k(j n mr T U$ minUT ikwk,ninn 8T v UriT SnUT 4$nirin TUn aHys(naST,ymns$U nTNhsSnj k,T MRV 8T - k mn TUn aHys(naST,ymns$U nT NhsSnj k,T MRVT yrUrUThn mT4$ ks$n Ty,kcTHI maSTm(8 j T4nsST I ksn minUTr ni TVTn4n,ncTakj nmnSTj ks$ rUST

BykHSaSk Ua;T
TTTTTTTTTTTT) aU$ nUkTT pU48T) ssysTT <TNh,rkTT bsE*<*GTT
E0UkswkI UGTT C28K9I I 0TTTT L8>L2I f TTT C289K. TTTT 2812f 2TTT
bn on mTTTTTT 282>KK1TTTTT 282f Lf LTTTT 98f >. TTTT 282L>KTqT
,ymE,csUGTTTT 28f 199KTTTTT 28L01I KTTTT 98KL2TTTT 282LI 2TqT
gr„T4kNSn wkT ;T>L8f I 9TTy T0I T4kmskkaTyHFskk4y(T
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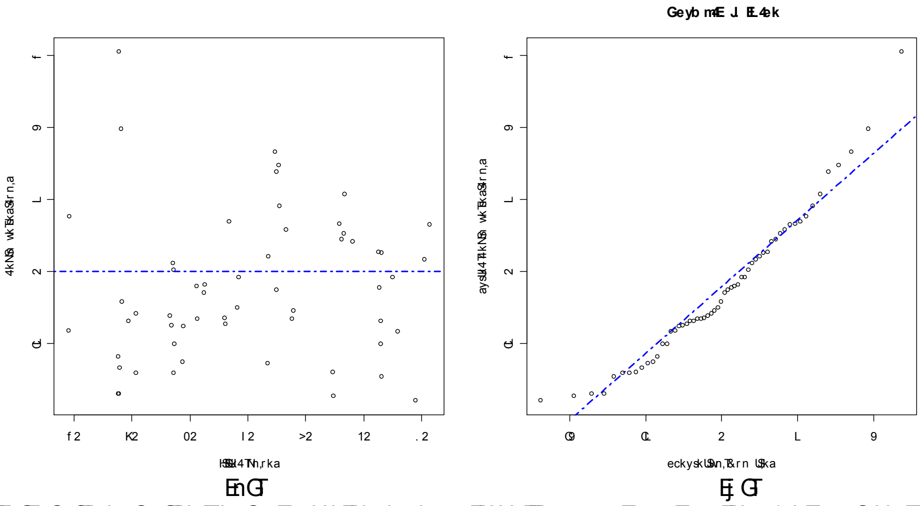
6 0B T ;T0>L8f LT



EnGT EjGT

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pkcS mmnT(y4k,Thn mT4SnaS n Tn4n,nc;TT *Hu)hbixnA\.KF53*7KFK*9)gxuoxu(A7KFN638Hu)HR0A8T* QnsSnj k,TI n on mTsrnaT4n T, EMRVGTaSn $$Sn T I n4nT,kNk,T . 0T I ksak 8T g $nST *yosvxut o* T4$ nmST 4k mn T4ksnon4T kj kj nan T(k 4ki nU$FTanUrST

E d n(j nsT f EnGT hn mT (ksrI nin T I ,yUT *yosvxut oT rofvydxnTi* Ukscn4nI T $nST I sk4$ aST (k r oiin TmkonnT Nhs$n Tiy aUn FT 4$ n nT akj nmSn Tj kansTU$$TUks,kUni T n4nTsk Un mThn mT iy aUn T4Saki SnsT y,8T *Bbn- xnTi dxuivnoTr nbiT* n4nT d n(j nsT EjGT(k r oiin T k h$ I n mn Thn mT ikwSTUkscn4nI T4SaU$ raST ys(n,8EE

E

SKPMD L- OI GE

t ys(r,nT *xtt wyouiTnxio* Thn mTak,n(nTS ST 4Sn nin T irsn mT Nh,$4FT insk nT crj r mn T n UnsnTor(,ncTikwk,ninn T4k mn TMRVT(nrIr T I n on mTsrnaTI n4nTi k hnUnn hnTU$ni Tj ksaSnUT ,S $ks8T P y4k,Tskmska ST ,S $ksT 4k mn T 4SaU$ raST ys(n,T U$ni T (k(n4nST r UriT (k(I sk4$ aST ikwk,ninn FTi nsk nT4nsST4nUnThn mT4Snr nin T

4n,n(TIk k,$$n TS$T4$k(rin TjncDnTU$minUT ikwk,ninn TU4niTUksjriU$T(k m$rU$T4$aU$raST ys(n,8T

VkmskaST bySay T,kj$T(k wks(Sin T insniUks$aU$T ikon4$n T ikwk,ninn FT hn mT 4$kUhcrSTjksa$HU4aisFTnwniTEn 4y(GT4n T ,n min8Tgn(r FTIk mmr nn T4aUraSTbySay T hn mT(k mar(a$n Tikan(nn TsxnxuT4n T -oxuTU4niTTUkswks(ST4n,n(T4nUh3Tikon4$n T ikwk,ninn Thn mT4$n$T4n,n(TIk k,$$n TSST (k m4na$n TmkonnTbsonyvfrorfv8T

pkjnmnSTn,Uks nU$T4nsTskmskaSTbySay FT skmskaST 4k mn T (k mmr nin T 4aUraST :Sy($n,TgkmnU$TIn,SmTjn$T(kskIskak Uha$n T ikon4$n Tikwk,ninn T4k mn Tn4n hnTmkon,nT bsonyvfrorfvT n4nT4nUh8E

E

TI NI AE- PNI SI T

6,,Say FTbnr,T- 8TL...8TMymaUVTVkmskaa$y TvaSmT UckTp6pTphaUk(;TeckyshTn 4T6II,SwnU$y 8T BnshFTgB8Tp6pTOaU$UUkTOw8T

T

:y kay FTu8T68TTn 4Tb8Te8TPwByh8TL..>8T")HHkwUT yHTPk4$n TesknU(k UTy Tvsjn T6sUks$n,T pnHkUh;T6 T6ww$4k UTbsk4wUy TPy4k,FVT R$ncDnhT VkaknswcT Vkwys4T L01LFT R$ncDnhTVkaknswcT:yns4FT nacSmUy FT -8B8T

T

:syD FTR8TB8Tn 4T68Tb8Tensiy8TL...8T")HHkwUaTyHT 6wwkaaT By U$y,Ty TpnHkUhTy Tvsjn T 6sUks$n,T pU$kkUaFVT R$ncDnhT VkaknswcT Vkwys4TLII0FTR$ncDnhTVkaknswcT:yns4FT nacSmUy FT 8B8T

T

-kNyskFTunhTM8TL..L8Tgrbjxjvmiw TxuyTDixivfivtfT pbnT Vu(wooru(T xuyT ieoT Dtvout of 8T :syyiaYBy,kTbrj,$acSmTBy(In hFTbna$$$wT dsyNkFTBn,$Hys $n8T

T

dnsjksFTg8u8Tn 4T6868T)cscnsUF92228TheoTopotifT bpT frooyJT pbaJT xuyT (ob-ointT texnxtionfivtfTbuTtnxfeTnxiofTpbnTyporouiT iwrofTbpTsv(wuxTev(eaxwf8Tt Sn,TVkIysUFT QSmS$nTesn alysUhU$y TVkaknswcTByr w$FT QeVBT22CVL08T

T

Rn4$FTP8Tu8T6sr,4cnaFTM8T8TBcyDFTn 4Tu8u868T nUUkDysUcFT L..08T)aU$ nU$mT anHkUhT kHHkwUaTyHTwsyaaGakwU$y T4ka$n TyHTNhs$yraT chmcDnhTUhIkaTraSmT kmnU$NkTjSy($n,T skmskaa$y 8T hnxufrbriFT 0ofFT 0otbny8T L022;LI.CL>I8T

T

5r$ n FTP8T 8TByr w$FTt8P8Tn 4T-8T 8T VkSHIsU$TL..f8T"6aayw$nU$y TyHTPk4$n T S4UcTn 4TR$ncDnhT6ww$4k UT VnUkaFVT Rv(eaxwT0ofoxrteT0otbnyT25K2FTR$ncDnhT VkaknswcT:yns4FT nacSmUy FT 8B8T

T

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T

Mys4FT-8Tn 4T:8Tg8Tbksanr48T92228T"6ww$4k UT bsk4$wU$y T Py4k,aT $UcT n 4T $UcyrUT esk 4;T6II,SwnU$y TyHTUckTdk ksn,S$k4T)aU$nU$mT)zrnU$y aT bsywk4rskFVT Rv(eaxwT0ofoxrteT0otbnyT2*2*FTR$ncDnhT VkaknswcT:yns4FT nacSmUy FT 8B8T

T

PncksFTP8u8Tn 4TGT pr((ksam$FTL..I8T6T wy(InsnU$NkT(kUcy4y,ymhTHysTUckTHUmTyHT Isk4wUNkTnww$4k UT(y4k,a8T, ttwyFT, uxmFT , uyTgros8F91E_GT91LG9.I8T

T

PSnyrFTp8FTRrFTb8Tp8FT s$ncUFTe8FTVnUc$FT68T58Tn 4T p8TB8T-nN$a8TL..98T"Vk,nU$y ac$T:kUDkk T esrwiT6ww$4k UaTn 4TR$ncDnhTdky(kUs$wT -ka$n ;T6TbySay TVkmskaa$y T6IIsynwcFVT Rv(eaxwT0ofoxrteT0otbnyT2N*SFTR$ncDnhT VkaknswcT:yns4FT nacSmUy FT 8B8T

T

gkUksFTu8FT 8T naaks(n FTn 4TP8R8T5rUksFT L...8T,rrmoyT0o(roffvbuTβbyorhJT3[uy]Toy8T VSwcns4T-8TGDSFTOw8FT yaUy 8T

T

bkU$rwwk,,$FTuyakIcT-FT:8Tgn 4sn(Tn 4TP8T Bck 8T L...8T ,rrmoyT DixivfivtfT pbnT Vu(wooruf TxuyTDtvouivfif 8TgkDTuksakh3T bsk U$NkTRn,,8T

T

&SFTλ3TONh FTu8g88TVnN$acn iksFTg8FTATM8FTu8T 92208TR$snswc$wn,T:nhka$n T)aU$ nU$y TyHT pnHkUhTbksHys(n wkTtr w$y aTHysTeDyOMh kT R$ncDnhaTvaSmTPnsiyNTwcnSTPy UkTBns,yT Py4k,SmFT kbdnuxmT bpT hnxufrbrixivbuT Vu(wooru(FTQy,8TLfLFTgy8T08T

T

V$kFTuyc T68TL.118Tβxieo-xivtxmTDixivfivtfTxuyT xixT,uxmna$8TBn,$Hys $n3T n4aDysUcTAT :syyiaYBy,kT64Nh wk4T:yyiaTATpyHUDnsk8T

T

pnwwy(n yFT t88T AT B8T :rhwy8T L.118T dk ksn,S$k4TMym,SknsTPy4k,aTyHTesrwiT 6ww$4k UT VnUkaFT Rv(eaxwT 0ofoxrteT 0otbnyT22*3FTR$ncDnhTVkaknswcT:yns4FT nacSmUy FT 8B8T