```
! "#$%&%"'()&(**+,,'-%,,+*.'!/010'
                                             !23456632'34'$578983:.'+;528<=>'
                                          /?;=:8<856'18@8683:'A=B?7<C'A5773D'
                                               !=B848B', ?<E52=: 'F:8@5268<C'
                                                  \#=B3 ; = .'G "'HIJJK'
                                              L=<28B8=3M8775:N9;=870B3;
! 23456632'34' $ 578983 : .'+ ; 528<='=:0' / ? ; = : 8<856' 1 8@8683 : 'A=B ?7<C'A5773D.'
""4?:050"PC" < E5", 877C" + :03D; 5:<"
                                                                                                    QRSHTL2565:<'
$578983:.'&?7<?25'=:0'U3B8=7',845'8:'<E5'!=B848B'*32<ED56<V'&=<E378B86;'8:'*32<E'";528B=V'&E286<8=:&C'8:'*32<E'
"; 528B=V"$578983: '=: O'63B8=7'<E532C'WB3: <5X<.'B3;;?: &<C.'6L828<?=7&<CYV'#E537398B=7' $5475B<83: V"#5=BE8: 9'<E53739C'=: O'
2578983: '
Z33M6['
        ! "#$%&'($)*$!)+),,)-.$/#0121)'3$451,167&01683$&'($4#970&,168$1'\$0"#$:&91*19$;),6"-#<60'&3T508<32'D8\E'!=?7'
        Z2=: O'U=2=E'G87M8:6T, =47=::50' =:B3?@52.'Z\&['F:8@5268<C'34'Z28&6E'&37?:P8='!2566.'432<EB3:8:9.'
        ORO00'
        ! "#$=767,#$)*$>&6")0191<+$1'$?+#,19&0'+08<320'*5D'] 32M['&37?; P8='F:8@5268<C'!2566.'QRSH'W^=2M'U87M.'
        652856>65B3:0'508<32Y0'
        4#0#96#($%#66#, <$)*$?@A@?@$B0&'9"#63$B1<")5$)*$C&00&$C&00&$&'($;#<D7&083$EFGHIEFJK0'+08<50'D8<E'$3P52<='
        U<28:9E=; 'Z23D:0'U5=<<75['F:8@5268<C'34'G=6E8:9<3:'!2566.'QRS_0'
        /#0121) '$&' ($:7L019$%1*#$1 '$6"#$: &91*19$; ),6" - #<6.$! "#$; ) '#$M) '#0"+08<320',=:E=;.' ^ 1[' "7<=' ^82='!2566'
        QRRJ'W^=2M'U87M.'652856>65B3:0'508<32Y0'
        ! "#$/)+&'$>&6")0!9$N05#, !#'9#$)*$4+&00$>", !<61&'$>)++7'16!#<0''*]['!=?786<'!2566.'QRR0'Z52:=20'`0', 55.'
        U0 ^ 0'L28; =2C'=?<E320'W - 8775: 'B3:<28P?<8:9'=?<E32Y0'
        ?2#'(&$*),\6"#\4+\&00\$>"7,9".\?\$P\&'(L))\Q\$*),\$A1'1<6,80\'156' ^38:56.\\"\"\*=\83:=\"\&=\E378B\\$?2=\",\845\
        &3:4525:B5.'SHHI.'W1=@80'a0'":025D6.'B3T508<32Y0''
        =1'(1'2\$R7,\$S)19\#<.\$C)+\#'3\$C1<()+\$\&'(\$=\&16"0"*]['\&236623=0'!?P786E8:9'\&3;L=:C.'SHHK0']
        !"#$?,6$)*$!"#)0)219&0$/#*0#961)'0'*]['&236623=0'!?P786E8:9'SHHJ0'\`3E:'05'Z552.'65B3:0'=?<E32\0''
"2<8B756.'&E=L<526.'+:BCB73L508='+:<2856['
        b-55L8:9'<E5'!3D52'34'G8603; '"BB5668P75['$578983:'15L=2<; 5:<6'8:'&E?2BET$57=<50'&3775956'8:'(?2'#8; 5c'
```

!526L5B<8@56'8:'\$578983?6'U<?0856.'Jd>J'WG8:<52'QRSHY['JR TJSe0'

! ! "#\$\$%&! (!

34'!=?7'Z=<32'^5; 328=7'"D=200Y'

! ! "#\$\$%&!)!

 $\label{eq:basic_solution} \begin{array}{l} b\ ,\ 3@8:9'\ a\ 30'PC'\ ,\ 3@8:9'\ g\ ?56\ &3:6['\ ''\ :'\ 'LL23=BE'\ &3:186B52:8:9'\ \ 3B=\ &3:'8:'='\&3:\ &56\ &50'\ &578983?6'\#2=08\ &3:.'\ ,\ &77C'\ &5773D6'\ &5983:=7'\&3:\ &5525:B5.'\ a\ 53295\ &3D:'\ &377595.'\ a\ 53295\ &3D:'\ &277595.'\ a\ 53295\ &3D:'\ &377595.'\ a\ 53295\ &3D:'\ &377595.'\ &377595$

b\$5475B<83:6'3:'&325'&?228B?7?;.'^86683:.'=:0'&=<E378B'%05:<8<C0c''&3:4525:B5'3:'<E5'%05='34'='&=<E378B'F:8@5268<C.'-8:906'&377595.'UB2=:<3:.'!".'U5L<5; P52'SITQR.'QRSJ0'

bG8603; '8: '<E5'!7=f=

! ! "#\$\$%&!

```
!
                                                                                                            '' #$$%&!
!=B848B', ?<E52=: 'F:8@5268<C'
        "6686<=:<.'"663B8=<5.'=:0'!23456632'34'$578983:' '
                                                                                                   SHIHTQRSR'
,3C37='F:8@5268<C'34'&E8B=93'
        "6686<=:<'!23456632.'!=6<32=7'U<?0856>#E53739C' '
                                                                                                   SHIKTSHIH'
"B=05; 8B'\8B5'!256805:<.'a3:f=9='F:8@5268<C''
                                                                                                   ORSRTORSK'
        $56L3:68P75'432'=77'=B=05; 8B'L2392=; 6.'4=B?7<C.'=:0'6<=44'8:'05L=2<; 5:<6.'B377595'=:0'6BE3376.'=:0'3448B56'=:0'
        L2392=; 6'<E=<'6?LL32<'<E5'4?:B<\83:\8:9'=:0'h?=7\8<C'34'=B=O5; \8B'L2392=; 60' ( @526=D'0\8@526\8<C'\8:\8<\8=<\8@56.'
        8:6<8<?<83:=7'=BB2508<=<83:'=:0'=66566;5:<.'&3;;5:B5;5:<'=:0'=B=O5;8B'5@5:<6.'=:0'=B=O5;8B'5BE:3739C0'
        ^=:=950'=::?=7'=B=05;8B'65B<32'P?095<0''
<u>!23@36<'=:0'15=:'34'a2=0?=<5'U<?0856.'!=B848B'</u>, ?<E52=:'F:8@5268<C'
                                                                                                   QRRdTQRSR'
        $56L3:68P75'432'=77'=B=O5; 8B'L2392=; 6'34'&377595'34' "2<6'=:0'UB85:B56'=:0"
        UBE3376'34'Z?68:566.'&3;;?:8B=<83:'"2<6.'+0?B=<83:.'=:0'*?268:9\",8P2=2C\"
        %:6<&<?<83:=7'$565=2BE'=:0' "66566;5:<\!\' "B=05;\!\B' "0@\!68:9'=:0' "66\!66=:B5\!\'
        a 2=0?=<5'L2392=; 6V'&3;; ?:&C'(?<25=BEV'B3; L3650'=:0';=:=950'=B=05; &B''
        08@8683: 'P?095<''
        !E010" U<=:4320'F:8@5268<C'W$578983?6'U<?0856T";528B=:'$578983?6'/86<32CY"
        ^0"0" U<=:4320'F:8@5268<C'W$578983?6'U<?0856Y''
                a3:f=9='F:8@5268<C'W#E53739C'=:0'$578983?6'U<?0856Y'
                 'n' "@=87=P75'?L3:'25h?56<'
```