A 8B=0 *5 2>'\$\$=\$30\1\$'>; :=:\|'\$D\E\$:(=(8(="\$'\%?*:*'607

F'⇒\$3%1DD6*::5 26%A6%H"I%JKJLM,

!=(;N)('(*NO=PN!"8\$(6;5 Q'=6R'\$S:0%1T%00JJK/JLM,%U)1

27"\$*5 0,J/VJV/LLM.

Q' 15

*: 4"

! &) /1 2 ' 3 * %-

A (7 * 6%` D * : @ 6=R * a5	

! *6(-B=@'(*]
&-P>" # '	
1::"@='(*]
<6'\$:B*6%1::"@='(*]
<*6#=\$'%1::"@='(*]
H'@7*>"6":]
2":(R'@7*>"6/:%@*6(=B=@'(*]
F':(*6/:]
2":(/#':(*6%:%@*6(-B-@'(*	
&"@("6'%D*36**	1
6*:*'6@7N:@7">'6:7=P	J
&"@("6'%D*36**%e	
P6"B*::="\$'%P6'@(=@*	
&"@("6'%D*36**\/\%"(7*6	

&"@("6'%D*36**\/\\"(7*6

!&)/1 2'3*%+

&*36**/:**S=\$30%B=6:(/(=#*%				
B6*:7#*\$	+ . V	М,,	KV	-,.
A(7*6%B=6:(/; * '6C%D*36**/: * *S=\$3%	-L,	- J+	-+J	М,+
1 » " (7 * 6 \(D * 3 6 * * / : * * \$ - \$ 3 \) ! "#\$ \(' () * ((+ , ((/)) \) 1 » \(' (7 * 6 \(8 \$ D * 6 3 6 \) D 8 \) (* : \(* * \$ 6 \) » * D \(* \)	O , M	.0,	К-,	. KM
-\$\%\0^*\0\6\\$\D^*\0\\$\\0\\0\\0\\0\\0\\0\\0\\0\\0\\0\\0\\0	MK	МО	К	-C-J0
&*36**/:**S=\$3CWB-6:(/(=#*	KJ	MK	- K	ML
1 % " (7 * 6%D * 36 * * /: * * \$-\$\$3 1 % " (7 * 6%36 ' D8 ' (* : % * \$6" » * D%\$%	- V .	- OM	- L+	+J-
@6*D=(%@"86:*: !"#\$%})*\$'O\$#(M			+L
				LCK, V
				0ĴK

&*36**/) **S=\$3 Q=6:(/<=#* Q=6:(%*'6	&*36**/) **S=\$3 U\$D*636'D8'(*:% `=\$@>8D*%B=6:(/(:#*% B=6:(/; *'6a	<"('> U\$D*636'D8'(*:\% 'R"(7\\D*36**/\%'\\$D\\ \$"\\$/D*36**/:**S-\\$3a
-+	KM	-,-
KM	MLV	VL+
+K	- K+	L
V-0	+CV.V	MCVM+
- , L	LV-	. OM
0	0-	-+0
J	М.	VK
0J	V+K	K+.
	V - K	J+.

! *6(±-@'(*ND-P>"#' MVM 1::"@:'(*%D*36**: +.-H'@7*>"6':%D*36**: KMM

2":(R'@7*>"6/:%@*6(-B=@'(*:

	-			
1/KS-(e('>\+, -+\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- , J	KL	+J.	VV-
H/\(\A\)B\(\7^\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\				,
! /\Q-\$'\\+, -+\\\\"7"6(\\'\\(\)\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	- , J	KL	+J.	VV-
&\\'\\\AB\(7*\c\\$-(: \s\+, -+\\0"7"6(\\7"c\\#'\\$;\\\0"7"\c\\#'\\$;\\\0"8"\\0"\\7"\\P6(\\7"c\\#'\\$)\\\0"\\\7"\\P6\\0"8\\\"\\\\88\\\"\\\"\\\"\\\\"\\\\\"\\\\\\	-+		LJ	0,
\(W\\\\AB\(7^\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	-	V	V-	LM
$ \begin{aligned} &Q \text{IV} \text{AB} (7^*\text{lc}\text{S-(c')}\text{H-}, -+\text{I0} \text{ "7'}6 (\%7'' \text{ c }\text{l} \text{ l'} \text{ '$;} \\ &0 \text{ "} \# \text{ P-'} \text{ "D'} (7^*\text{lP6} \text{ "36'} \text{ l'} \text{ lc} $	-,	V	- K	+0
$\label{eq:hi/l-condition} $$hi/l-c''(')^36'D8'(-$38c-(7-$8:=11;*'6:16':8#1'85')+$$$: 18.0000' SDIQa$	٧,	-0	-+M	+

! &) /H 2 ' 3* \\V

 $9 \, \text{M/S} \,) : 1/\,; \, \text{``6136'D8'} (: \text{``$16'} (\text{``18''}6)+, \, \text{-+}80''7''6} (\text{``h}) \\ \text{D-} D \, \text{DDR} \, ; 1 \, 1 \, \text{a} \, \text{,} \, \text{GMMO+.} \, \text{KJ-V} \\ \text{D-} D \, \text{CDR} \, ; 1 \, 1 \, \text{a} \, \text{,} \, \text{GMMO+.} \, \text{KJ-V} \\ \text{D-} D \, \text{CDR} \, ; 1 \, 1 \, \text{a} \, \text{,} \, \text{GMMO+.} \, \text{KJ-V} \\ \text{D-} D \, \text{CDR} \, ; 1 \, 1 \, \text{a} \, \text{,} \, \text{GMMO+.} \, \text{KJ-V} \\ \text{D-} D \, \text{CDR} \, ; 1 \, \text{A} \, \text{CDR} \, ; 1 \, \text{A} \, \text{CDR} \, ; 1 \, \text{A} \, \text{CDR} \, ; 1 \, \text{CDR} \,$, GVV+VVL, VM , GV - +LO . V - M

-L+

1/16\$:(=('>1/+, --1/0"7"6(1/0"818-6:(/(=#*0188>>/(=#*/ R'@7*>"61':\""6\"d8-^\>*\$(a\D*36**\:**S-\$3\\
8\$D*636'D8'(*/:(8D*\$(:

P*6:::(%'\$D\D:D\\$"(\36'D8'(*\8"6\(7*\8">>"c:\$3\ 6*':"\$:5%D*@*':*D0%P*6#'\$*\$(>;%D=:'R>*D0%'6#*D% B"6@*:C%B"6*:3\$%':D%:*6^:@*%"B%(7*%B*D*6'>% 3"^*6\$#*\$(C\\"6\\"BB=@='>\\@786@7\\#=::="\$:f\\("('>\\

! /\\Q=\$'>\\+, --\\@"7"6(C\\'B(*6\\'Dg8: (=\$3\\B"6\\ '»"c'R**1@>8:="\$:

&\/\\A\\(7*\\\=\:(='>\\+,--\\@"7"6(\\7"c\\#'\\$;\\ @"#P>*(*D)(7*\P6"36'#\=\$\8"86\;*'6:\\"6\>*::\\`R;\\ 1839M-0+, -Ka

٧JK

KK +K. VJK

0J

! &) /H 2'3*%K

! " # # "\$%&'('%) *(%+, - ./+, -0

! "#P>*(*6:%"8%P6"36' #:%"8%>*::%(7'\$%(c"%; *'6:%D86'(="\$%`("('x85%	
! "#P>*(*6:%"8%P6"36' #:%"8%>*::%(7'\$%(c"%;*'6:%c=(7=\$%-K,%P*6@*\$(%"8%\$"6#'>%(=#*5%	
! "#P>*(*6:%"8%P6"36' #:%"8%'(%>*':(%(c"%R8(%>*::%(7'\$%8"86%;*'6:%`("('xa6%	
! "#P>*(*6:%"B%P6"36' #:%"B%'(%>*':(%(c"%R8(%>*::%(7'\$%B"86/;*'6:%c=(7=\$%-K,%P*6@*\$(%"B%\$"6#'%(=#*5%	
<"(' \(6'\\$: B*6: / "8(\(\circ\) C=(7=\\$\(76**\); * '6: \(\dagger) ("\(\dagger) (7*6\); \(\dagger) (=(8(=\\$): 5\)	
<"('\%(6'\\$:\B*6:\\("\\(c"\); * '6\\-\\$:(\=(8(="\\$:5\\	
<"('-\%\6'\\$\-\8\-\\("\\\\\8\-\\\"\\\\\\\\\\\\\\\\\\	

2014 C

E\$=(=' \%+ , - \%0"7"6(\%("(' \%"B\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	
AB%(7*%-\$=(=' %+ , - V%@"7"6(C%7" c%#'\$;%D=D%\$"(%P*6:=:(%'\$D%D=D%\$"(%36' D8'(*%B"6%(7*%B")" c=\$3%	
6*':"\$:5%D*'(70%P*6#'\$*\$(%D::'R>=(;0%:*6^=@*%=\$%(7*%'6#*D%B"6@*:0%B"6*=3\$%'=D%:*6^=@*%"B%(7*%'6#*D%B"6@*:0%B"6*=3\$%'=D%:*6^=@*%"B%(7*%'6#*D%B"6@*:0%B"6*=3\$%'=D%:*6^=@*%"B%(7*%'6#*D%B"6@*:0%B"6#*=3\$%'	
B*D*6'%3"^*6\$#*\$(C%"6%"BB=0='%078607%#=::="\$:f%("('%'>"c'R>*%*10>8:="\$:5%	
Q=\$'\%+, -V\@"7"6(C\"B(*6\"D@8:(=\$3\B"6\"\"C"R*\"1@\8:="\$:\\`)8R(6'@(\d8*:(="\$\H-M\B6"#\	
d8*:(="\$%H-+a5	,
!"#P>*(*6:\"B\\P6"36'#:\"B*:\\(7'\\$\\(c"\\;*'6:\\D86'(="\\$\\\('\'\26\\)	
!"#P>*(*6:%"B%P6"36'#:%"B%>*::%(7'\$%(c"%;*'6:%c=(7=\$%-K,%P*6@*\$(%"B%\$"6#'%(=#*5%	
!"#P>*(*6:\"B\\P6"36'#:\"B\\'(\\\>*':\\(c"\\R8(\\>*::\\(7'\\\\\B\\\;*'\6:\\\'("('\a5\\	
! " #P>*(*6:\"B\P6"36' #:\"B\\'(*':\\(c"\\R8(*':\\(7'\\$\\\B'\86/;*'6:\\c-(7-\\$\\-K,\\P*6@*\\$(\\"B\\	
\$"6#'%(=#*5%	
<"(' \(\) \	
<"(' \%(6' \\$: \B * 6: \%(" \%(\c " / ; * ' 6\) = \\$: (={8(=" \\$: 5\)	
<pre><"('%(6'\$:8*6:%("%8"86/;*'6%=\$:5%</pre>	

7*\@"7"6(\"B\'>\B8>\/\:#*\R'@7*>"6i:\"6*d8-^'>*\$(a\D*36**/:**S-\$3\8\$D*636'D8'(*\	
\$(:%c7"%\$(*6*D%;"86%=\$:(=(8(="\$%':%86*:7#*\$%=\$%Q'»%+,-J%`"6%(7*%P6*@*D=\$3%:8##*6%	
sc% c7'(%P*6@*\$('3*%c':%*\$6">*D%'(%;"86%-\$:(=(8(="\$%':%"B%(7*%D'(*%;"86%-\$:(=(8(="\$%	
3>'(*:\%-(:\\"BB-@='*\\$6"\\#\\\$(\\=\\$\\Q'\\\+[\\	JMGMO n

! &) /H 2 ' 3 * || L

!&)/H 2'3*\J

J+L 0KJ KMJ $\mathsf{J}\mathsf{V}\mathsf{V}$ 2 '6(%!%Q=6: +L, ٧L +.V -,, *: 4" *: 4"] ?*d8=6*] <"('%'@'D*#=@%8\$=(: -L ٧ W\$3≍:7 F'(7*#'(=@: М) @=*\$@* М %%%AB%(7*:*C%8\$=(:%(7'(%#8:(%R*% %%%>'R Q"6*=3\$%'\$38'3*) "@='%:(8D=*: М 9=:("6; 1@'D*#=@%*>*@(=^*:

!&)/! 2'3*%.

!"#P8(*例)@:*\$@* o::8 *|2 *@*6#-\$3\16(: A(7***):P**過去;a

!&)/! 2'3*10

p8\$*%-K0%+,-0

x]

]

2 *60 * \$(\\: 8R #=((-\$3\\)) 1 <\\: 0 "6* : MO n +. 0 2 *60 * \$(\\: 8R #=((-\$3\\1)! <\\: 0 "6* : VV n MM-

+K(7%2*6@*\$(\$* JK(7%2*6@*\$(\$*

) 1 <\\W^=D * \$@ * /H ' : * D\\? * ' D=\$3\	6	
'\$D%Z6=(=\$3	VJK	KK.
) 1<%F ' (7	VK,	KV,
1!<%!"#P":=(*	-,	+K
1!<%F'(7		+K
1!<%W\$3≽:7	- J	+K
1!<%Z6=(=\$3	V	

!&)/!

!&)/! 2'3*%-M

	*:	4 "	1
&" *: %; "86%=\$:(=(8(="\$%"BB*6%'\$%*'6); %D*@=:="\$%P>'\$%`'\$%'D#=::="\$%P>'\$%(7'(%			
P*6#=(:%:(8D*\$(:%("%'PP>;%'\$D\\R*\\$"(&=*D\\"B\'\$\\"D#=::="\$\\D*@=:="\$\\c*>\\			
=\$%'D^'\$@*%"B%(7*%6*38>'6%\$"(=8=@'(="\$%D'(*%'\$D%(7'(%':S:%:(8D*\$(:%("%]	
@"##=(%("%'((*\$D=\$3%=8%'@@*P(*Da%B"6%B=6:(/(=#*C%B=6:(/;*'6%`B6*:7#'\$a%			
'PP>@'\$(:\\8"6\\8' \%*\$6"\>#*\$([\\			
EB\u; *: C\P>* ': *\0" #P>* (*\(7*\B">" c=\$35\\		İ	
Q-6: (\"6\"\$>;\"^6;\D^6::="\$\P>'\$\\0}' :=\$3\\D'(*			
Q-6: (\""6\"\\$\;\\"\"6; \\D*\@-:="\\$\\P\\'\$\\\$\\"\(\frac{4}-\@\'\(-\)\"\\$\\D\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
A(7*6%*'6;%D*0=:="\$\P>'\$\\0;\D'(* A(7*6%*'6;\D*0=:="\$\P>'\$\\0;\D'(**			
TA(1 011 0/, 110 6-:- \$\psi 1 \psi		I	
48 #R*6%"B%*'6;%D*@=:="\$%'PP>=@'(="\$:%6*@*=^*D%R;%;"86%=\$:(=(8(="\$			
48 #R*6%"B%'PP>@'\$(:%'D#=((*D%8\$D*6%*'6;%D*@=:="\$%P>'\$			
2>*':*\P6"^=D*\::3\$=60'\$(\D*('>:\'R"8(\;"86*'6;\D*@=:="\$\P>'\$5\\\		•	1
	*.	4"	
&"%;"8%7'^*%'%\$"\$R=\$D=\$3%*'6;%'@(="\$%P>'\$%c7*6*R;%:(8D*\$(:%'6*%	\ " :	4	
\$"(\frac{4}{2}\text{P}\"\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\			
\$"(\frac{4}{2}\text{0}' (="\\$\D' (\\$\R8(\\D'\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\		1	
		,	
EB%u; *: Cv%P>*': *%@" #P>*(*%(7*%B"»" c=\$35%		ī	
14/10 #10/###### #########################		1	

E: ``; "86'' * `` 6; `` ' @(="\$``P>'\$``' `` 6* '`

4"

W'6; %'@(="\$%@>":=\$3%D'(* W'6;%'@(="\$%\$"(=B=@'(="\$%D'(*

*:

! " # # " \$%& ' (' %) * (%+ , - . /+ , - 0

1@@*>*6'(*D%P6"36'#]
! " " P * 6' (-^ * 1 * D 8 0 ' (= " \$ 1 P 6 " 3 6 ' #]
! 6" : : /6* 3=: (6' (=" \$	
&=:('\$@*\b*'6\$=\$3]
&"8R>*%#'g"6]
&8'\%*\$6"\#*\$(]
W\$3>:7%':%'%) *@"\$D%_'\$38'3*%W)_a]
W1@7'\$3*\:(8D*\$(\P6"36'#\\`D"#*:(-@a]
WI(*6\$'\%D*36**\P6"36' #]
9"\$"6:%26"36' #	

!&)/W 2'3*%-L

Q=6:(/(=#*0%B=6:(/;*'6% `B6*:7#'\$&:(8D*\$(:% U\$D*636'D8'(*:

> 0 n - V n w%- n w%- n w%- n w%- n

KLn

!&)/Q 2'3*%-J

A(7*%7"8:=\$3%"P(="\$:%`:P*@+3;&] 1>':S'%4'(=^*\@8x(86'\%7"8:=\$3

!&)/Q 2'3*%-.

	Q=6:(/\ * ' 6	U\$D*636'D8'(*:
2?Eo1 <w%e4)<e<u<ea4)< td=""><td></td><td></td></w%e4)<e<u<ea4)<>		
<8=(=" \$ 5		
2UH_E!		
<8=(="\$ 5		
%%%E\$/D=: (6=@(sLCLO,	s.C,J,
2UH_E!%E4) <e<u<ea4)%< td=""><td></td><td></td></e<u<ea4)%<>		
%%%E\$/:('(*%`"8(/"B/D=:(6=@(a5	sLCLO,	s.C,J,
2UH_E!		
%%%A8(/"B/:('(*5		

!&)/h 2'3*11-0

&"%(8=(="\$%'\$D\%"*:\%'6;\%R;\%\$D*636'D8'(*\=\$:(68@(="\$'\%)P6"36'#[\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1	
	n	
E8%; *: C%c7' (%P*60*\$('3*%"8%88»/(:#*%8\$D*636'D8'(*:%P';%#"6*% (7'\$%(7*%(8=(="\$%'\$D%8**:%6*P"6(*D%=\$%h-[M, n	

26"^=D*%(7*%*:(=#'(*D%*IP*\$:*:%8"6%'%(;P=@'%88>)/(=#*%8\$D*636'D8'(*%:(8D*\$(5

	?*:=D*\$(:	! " # #8(*6: `>-^=\$3%' (%7 " # *a	! "##8(*6: `\$"(%>^=\$3%'(%7"#*a
H""S:%'\$D%:8PP≈*:	s+C,,,	s+C,,,,	s+C,,,
?""#%"\$>;			sMCL,,
H"'6D%"\$>;		sKCMO,	sKCMO,
?""#%'\$D\\R"'6D\\("('\>\\\`=\\\;"86\\ @"\>*3\\@'\\$\$"(\\P6"\-D\\\:\P'6'(\\\ 6""#\\`\$D\\R"'6D\\\\=386\:\\\\"6\\ @"##8(\\6:\\\$"(\\\~\-\$3\\'(\\\7'\#*a5			
<6'\$:P"6('(="\$	sV,,	s+C,,,,	S+C,,,
A(7*6%*IP*\$:*:	s+C+K,	s+l+K,	s+C+K,

LI\$D*636'D8'(*\P*6\06*D=(\7"86\\07'63*\\\)(8=(=\\$\\\\\$)

0\$0 030 08 ("\P"0/@0" D=(// 80\@/ 03"	:h(8=(= \$h \$>;a
2?Eo1 <w%e4)<e<u<ea4)5< td=""><td></td></w%e4)<e<u<ea4)5<>	
2UH_E!%E4) <e<u<ea4)%< td=""><td></td></e<u<ea4)%<>	
%%%E\$/D=:(6=@(5	s+L06,,
2UH_E!%E4) <e<u<ea4)%< td=""><td></td></e<u<ea4)%<>	
%%%E\$/:('(*%`"8(/"B/D=:(6=@(a5	s+L06,,
2UH_E! %E4) <e<u<ea4) %<="" td=""><td></td></e<u<ea4)>	
%%%A8(/"B/:('(*5	s.MKG,,
4A4?W)E&W4<%1_EW4)5	
	s.MKG,,

!&)/9 2'3*\+-

 $s.J, {\tt CVO}$,

s+L,COKK

^{&#}x27;a 48#R*6%"B%D*36**/:**S=\$3%8\$D*636'D8'(*%:(8D*\$(:%`!&)%

@a	48#R*6%"8%:(8D*\$(:%=\$%>=\$*% %c7"%c*6*%D*(*6#=\$*D%("%7'^*% %=\$'\$@='\%\$**D	M.+	-L+-	OK-
Da	48#R*6%"B%: (8D*\$(:%=\$%>=\$*% %c7"%c*6*%'c'6D*D%'\$;% %=\$'\$@='>%'=D	MKJ	-KL-	.KJ
*a	48#R*6%"B%:(8D*\$(:%=\$%>=\$*% %c7"%c*6*%'c'6D*D%'\$;%\$**D/R':*D%:@7">'6:7=P%"6%36'\$(%'=D	M+M	-ML.	LJK
Ва	48#R*6%"B%:(8D*\$(:%=\$%>=\$*% %c7"%c*6*%'c'6D*D%'\$;%\$**D/R':*D%:*>8/7*>P%'=D	-LM	.V,	VOL
3 a	48#R*6%"B%:(8D*\$(:%=\$%>\$*% %c7"%c*6*%'c'6D*D%'\$;%\$"\$/ \$**D/R':*D%:@7">'6:7=P%"6%36'\$(%'=D	VO	-L-	V
7 a	48#R*6%"B%:(8D*\$(:%=\$%>\$*% %c7":*%\$**D%c':%88>;%#*(% `*1@>8D*%2_U)%"'\$;;%8\$:8R;=D=I*D%"'\$;;%'\$D%P6=^'(*% '\/*6\$'(=^*%"'\$;a	LK	+V,	- M
: a	A\$\`^*6'3*C\(7*\P*60*\$('3*\B\\\$**D\\(7'\\\c'\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	KV6. n	KV∮+ n	+LGK n
ga	<pre><7*\'^*6'3*\B:\\$'\\$@:'\\':D\\P'@\S'3*\\"B\\(7":*\:\\$\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</pre>	s%%%.C+.V	s###.CLVO	s%%VCLM+
Sa	1^*6'3*%\$**D/R':*D%:@7">'6:7=P%'\$D%36'\$(%'c'6D%"B%(7":*%-\$)>=\$	s‱J0+JK	s%%JCLL-	s%%MCLM-
	1^*6'3*\\$**D\R':*D\\$:*\8\7*\P\"c'6D\\ <u>"1@\8D=\$3\2_U)\\</u> > <u>"'\$:C\8\$;8R:=D=1*D\>"'\$:C\\"\$D\P\P\"(*\\')\(*6\$'(=^*\>"'\$;</u> a\\ "B\(7":*\=\$\\\$*\	\$%%+C,	s%%MCJKV	s%%MCK.V
#a	1^*6'3*\\$**D/R':*D\\$"'\$*\ <u>\\$*\\\$\\\$\\\$\\\\\$\\\\$\\\\$\\\\\$\</u>			

!&)/9 2'3*%++

%\\\:\(8D*\$(:\%c7"\D-D\\\$"(\%36'D8'(*\"6\)c7"\\36'D8'(*\"6\)C7"\\36'D8'(*\"6\)C*\(7*\"6\)D*36**\\"6\\@*6\(\@-\)@'(*\\`R8\\\\\$"\\R'\\@7*>"\6':\\D*36**\a

""" (ου φί. "οι "Β-Βηφ (που Βο (" " οι οι οι " οι	(114 111 01 / 01.110 0	
26"^=D*\(7*\\\$8#R*6\\"B\:(8D*\\$(:\:\=\\(7*\\+,\\8\\\$D*636'D8'(*\\@\'::\\c7"\\:('6(*D\\'(\\;\"86\\		
=\$:(=(8(="\$%':\B=6:(/(=#*\:(8D*\$(:\\'\$D\\6*@*=^*D\\'\\R'\@7*>"6':\\D*36**\\R*(c**\$\\p8>;\\-C\\+,-J\\'\\$D\\		
p8\$*\M, \%+,\%\VI@\8D*\:(8D*\(:\c7\\6'\\$:\8*66*D\\\$(\\;\"\;\"86\\\$:\\$:(\=(8(\=\\$)	+0-	

 $48\#R*6\%*SDM*F*68*S\%*B:(8D*\$(:\$50\$)::\$10^*\$5^*D\c\$9\$'\R"^*+a^*R*66"c^*2386"\#8*D*6'`\03^*$\$60^*c^*\03^*$\$60^*c^*\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*$\$10^*6'`\03^*\$10^*6'`\03^*$\$

Source/Type of Loan	Number in the class (defined in H4 above) who borrowed from the types of loans specified in the first column	Percent of the class (defined above) who borrowed from the types of loans specified in the first column (nearest 1%)	Average per- undergraduate- borrower cumulative principal borrowed from the types of loans specified in the first column (nearest \$1)	
'å11\$;%" '\$%P6"36' #5%Q*D*6'%2*6S-\$:(%Q*D*6'%)('88"6D%))8R:-D=1*D%'\$D%U\$:8R:-D=1*D%\\$:(=(8(="\$'\%'\:('(*\%\P6\^'('\%')\)''')\\$(7'(\%;"86\-\$:(-(8(="\$\%:\%'('6\%*\80*\\"(7\%\)\)''''\\$(\%*\80*\\\"(7\%\)\\$(\%\\\8D*\\\"(7\%\)\\\$(\%\\\8D*\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	L	MOG. L n	s+0CLL+	
Ra%Q*D*6'%>"'\$%P6"36'#:5%Q*D*6'%2*6S:\$:0%Q*D*6'%)('88"6D%)8R:=D=I*D%'\$D%U\$:8R:=D=I*D%E\$@>8D*%R"(7% Q*D*6'%&-6*@(%)(8D*\$(%_"'\$:%'\$D%Q*D*6'%Q'#⇒;% WD8@'(:"\$%_"'\$:0	M	M . G . M n	s+V00+M	
@a%E\$:(=(8(="\$'\%"'\$%P6"36'#:6				
Da%)('(*%"'\$%P6"36'#:6	-+	V6- , n	s0V+J	
a%26^'(%:(8D*\$(%)"'\$:%#'D*%R;%'%R'\$\$%"6%*\$D*66	-L	KGK, n	s+K0+,J	

 $\%^4$ "(*5%?*P"6(%\$8#R*6:%'\$D%D"»'6%

E\$D=0'(*%;"86%\$:(=(8(="\$i:\P">=0;\6*3'6D=\$3\=\$:(=(8(="\$'\%:07">'6:7=P\%'\\$D\\36'\\$(\%'=D\\B''0\\8\\$D*636'\D8'(*\\D*36**/:**S=\$3\\\$"\\$6":D*\\$(\%'\=\S'\)

- + + + + / + .	
E\$:(=(8(="\$'\%\$**D/R':*D\%:@7"\>'6:7=P\%"6\%36'\$(\%'=D\%=:\%'^'**\R\>*	
E\$:(=(8(="\$'\%\$"\$/\$**D/R':*D\%:@7"\>'6:7=P\\"6\\36'\$(\\'=D\\=:\\'^'\=\'R\>]
E\$:(=(8(="\$'\%:@7"\>'6:7=P\\"6\\36'\\$(\\'=D\\=:\\\$"(\\'\^'\\>'R*	

EB%\$:(=(8(="\$'\%B-\$'\$@='\%'=D\E:\\'^\=\'R*\B"\\8\$D*636'D8'(*\D*36**/:**\$-\$3\\\$"\$6*:=D*\$(\\'\=\\$:\)	
P6"^=D*%(7*%\$8#R*6%"B%8\$D*636'D8'(*%D*36**/:**\$=\$3%\$"\$6*:=D*\$(%';*\$:%c7"%c*6*%'c'6D*D%	
\$**D/R':*D\\"6\\\$"\$/\$**D/R':*D\\'=D5\\	+J

1^*6'3*%D"»'6%' #"8\$(%"8%=\$:(=(8(="\$'\%)=\$'\$@='\%'=D\%'c'6D*D\%("\%8\$D*636'D8'(*\%D*36**/	
: * * S=\$3%\$ " \$6* : ±D * \$(% ' >= * \$: 5%	s+,CLJK

!&)/9 2'3*%+M

^{&#}x27;#"8\$(:\B"6\(7*\\:'#*\\'@'D*#=@\\;*'6\\@7*@\$*D\\=\$\\=(*#\\9-Ga

```
sKK.C++J
                                                                                       ]
                                                                                            +N-K
                                                                                             JN-
                                                                  \ * :
]
                                                                                       4"
Ra )(8D*$(:\$"(==*D\\"$\\'\6">=$3\\R':=:5
   EB%; *: C%:('6(=$3%D'(*5
                                                                         +G,,
2>*':*%@7*@$\"BB\'>%(;P*:\"B\'=D\'^\='R>*\("\8\D\*636'D8'(*:\'(\;\"86\=\:(=(8(=\$5
QW&W?1_%&E?W!<%) <U&W4<%_A14%2?Ah?1F%`&E?W!<%_A14a
&-6*@(%) 8R:=D=I*D%) ('BB"6D%_"'$:
&-6*@(%U$:8R:=D=I*D%) ('BB"6D%_"'$:
&=6*@(%2_U)%_"'$:
                                                                                       ]
)@7">'6:7=P:%'$D%h6'$(:
4WW&/H1)W&5
                                                                                       ]
```

!&)/9 2'3*%+V

! 7 * @S%" BB%@6=(* 6= ' %8 : * D%=\$%' c ' 6D=\$3%=\$: (=(8(="\$' %' '=D6% ! 7 * 6	@S%'>%(7'(%'PP>;G%	
	4"\$/4**D%H':*D	4**D/H':*D
]]
]	
]	
	1	
	1	

EBK; "86K=\$: (=(8(="\$%7': %6*@*\$(>; %=#P>*#*\$(*DM'\$; %#'g"6KB=\$'\$@='%'=DMP">=@; CMP6"36'#CM"6MP(*BK) = (18(="\$%7': %6*@*\$(>; %=#P)*#'*\$(*DM'\$; %#'g"6KB=\$'\$) = (18(="\$%7': %6*@*\$(>; %=#P)*#'*) = (18(="\$%7': %6*@*\$(>; %="\$%7': %6*") = ((*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %), (*, %),

!&)/9 2'3*%+K

'\$D KO, B'@8>(;a6

+M+ +00 -ML V. -V -K V JV. +0 KL V , , , , , .0

! &) /E 2 ' 3*%+J

Agriculture			
Natural resources and conservation	, GV - n		V60 - n
Architecture	'		
Area, ethnic, and gender studies			,GJMn
Communication/journalism	•		MG,On
Communication technologies			
Computer and information sciences			,GJMn
Personal and culinary services	VGKK n	+G.Mn	
Education		, GMK n	VG,,n
Engineering			-MGVKn
Engineering technologies	J6VV n	- , GOK n	
Foreign languages, literatures, and linguistics			V00 - n
Family and consumer sciences	MGM - n	LGML n	+6,,n
Law/legal studies		MG.On	
English			VG,,n
Liberal arts/general studies		+KGVV n	
Library science			
Biological/life sciences			JGLV n
Mathematics and statistics			- GVK n
Military science and military technologies			
Interdisciplinary studies		2.12%	KGVK n
Parks and recreation			
Philosophy and religious studies			- G , O n
Theology and religious vocations			
Physical sciences			

!&)/p 2'3*\\+.

;**:%'c'6D*D6%<"%
\$(*D%(c:0*a6%!'>08>'(*%
7*%\$8#*6'("6%'\$D%(7*%
8(*%(7*%P*60*\$('3*:%

1
3
4
5
9
10
11
12
13
14
15
16
19
22
23
24
25
26
27
28 & 29
30
31
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
54

! &) /p 2 ' 3*%+0

 $1 \text{ \mathbb{N}^{+} (7' \text{ \mathbb{N}^{+} (8D^{+}$ (: \text{ \mathbb{N}^{+} (PP); $^{+}$ D\text{ \mathbb{N}^{+} $^{+}$ (-2^{+}D\text{ \mathbb{N}^{+} $^{+}}$ (-2^{+}D\text{ \mathbb{N}^{+} $^{+}}) (-2^{+}D\text{ $\mathbb{N}^{+}}) (-2^{+}D\text{ \mathbb{N}^{+} $^{+}}) (-2^{+}D\text{ $\mathbb{N}^{+}}) (-2^{+}D\text{ \mathbb{N}^{+} $^{+}}) (-2^{+}D\text{ \mathbb{N}^{+} $^{+}}) (-2^{+}D\text{ \mathbb{N}^{+} $^{+}}) (-2^{+}D\text{ $\mathbb{N}^{+}}) ($

! *\$(*6%"BB*6;\$3\"::::('\$@*\(76"837\(8("6:%c"6S:7"P:0\@"#P8(*6%P6"36'#:0\"6\"8D="^=:8'%
d8:P#\$(\%\$\%*'D-\$30\%c6:(\$30\%#'(70\"\$D\\:S:>:\\:80"\\:\\('\$-\$3\\\$"(*:0\\#'\$'3-\$3\\\:#*0\\('\$-\$3*:(:6
Q6**\\"6\\:"c\\@":(*3'\\"D-\@*\\B"\\\"\\\'83\\\"B\\:::\\"P*6:"\\$'\\\'\\$\\"\\"\7*6\\\\

 $! \ '("\$D*: @GR*\$36"8P: \$("\%D*: @GR*\$36"8P: \$("\%c?: @7\%-$DA': \$D*-$-18') \cdot : \$R*) * \$30\%-D*\$(3; \$c: (70\% "6R*) * \$31\%-\$ \$(7*\% * ; *: \% "8\%(7*\% " # #8$: (; 0%<7*\% " ' *3 "6* : %D "%$ " (*M : @=*$(-$-@%D*B-$-(="$: %"8%' $(76"P") "3 = @' ' %" "6-3-$: 0%1 %P*6: "$% #' ; \%R*% @"8$(*D\$-$\%"$>; \%"$*\36"8P6$

 $! \ '(*3"6; \%8 : *D\%("\%9)" : : ±; \% : (8D*\$(:\%"6)" * #P>"; ** : \% c 7" : *\%6' @*N*(7\$=@=(; \%=: \%\$"(\%S\$" c \$\%'$D\% c 7" #%-\$: (-(8(="$:%'6*\%8$" R>*\"%P)" @* %-\$\"8*" B\(7*\%P*@-**D\%6' @=' \)* (7$=@\@'(*3"6=*:6) (*3"6=*:6) (*3"6=*:6) (*3"6=*:6) (*3"6=*:6) (*3"6; %8:"6"6" * *10"$

) P*@='%@"\$:=D*6'(="\$\\3=^*\$\\5\\7*\\D#=::="\$\\P6''@*::\\

A\$*/"\$/"\$*%"6%36"8P%@"8\$:*x\$3%c:(7%6':\$*D%P6"B*::="\$'):%B"6%:(8D*\$(:%c7"%c')*(%("%*TP)"6*%6*x3="8:%P6"R>*#:%"6%::8*:6

 $Q=1*D*:8\# \$07'63*D \$("\%:(8D*$(:\8"6):4*\#:\$"(\0"^*6^*D)\R;\\(8=6:="$\%'$D\R';\\(8=6:="$\%'$D\R';\\(8=6:="$\%'$D\R';\\(8=6:="$\%'$D\R';\\(8=6:="$\%'$D\R';\\(8=6:="$\%'$D\R';\\(8=6:="$\%'$D\R';\\(8=6:="$\%'$B\R';\\(8=6:="$\$\\(8=6:="$\$\\(8=6:="$\$\\(8=6:="$\$\\(8=6:="$\$\\(8=6:="$\\(8=6:=$

1::8#*\D"8R>*\"@@8P'\$@;\:\$\:\$:(-(8(:"\$'\:\7"8::\\$3\\'\\$D\\-0\\\\\"\'\:\\P*6\\

c * * S%` "6% # ' I = # 8 # \ # * ' \ P>' \$aG

E\$B"6#'(="\$%#'=\$('=\$*D\R;\(7*\):*@"\$D'6;\\:@7""\\(7'(\\#';\\

 $-\$0 \times 10^{+} \times 10^$

patrick (1) (1) (1)

5%1%\$"\$8*D*6'%>"'\$%#'D*KR;%'%>*\$D*6%:8@7%':%'%R'\$\$\$\%@6*D=(%8\$="\$%"6MP6z^'(*%>*\$D*6%8:*D\%("%

P';%8"6%8P%("%(7*%'\$\$8'%0":(%"8%*D80'(="\$C%>*::%'\$;%8-\$'\$0='%'=D%6*0*=^*DG

5%Q*D*6'%'\$D%:('(*%c"6S%:(8D;%'=DC%'\$D%'\$;%*#P>";#*\$(%P'@S'3*D%R;%;"86%

[=\$:(=(8(="\$%=\$%B=\$'\$@='%'=D%'c'6D:0