Murika! / LED - IchigoJam

Fungura aka buto kari kuri IchigoJam. Muri sikirini Andika "LED1" wifashishije icyandikishwa(Keyboard). Hanyuma kanda buto yanditseho "ENTER". (Buto yanditseho "ENTER" iherereye iburyo bwawe kuri keyboard, Nkuko uyi bona kuri iyo foto).

LED1⏎

Niba agatara kari kuri IchigoJam katse byakunze, urabona ubutumwa muri sikilini buvuga ngo "OK".

Andika "LED0" hanyuma ukande "ENTER" kugirango uzimye agatara.

LED0⏎

Buto yitwa "SPACE" niyo nini muzindi zose kandi iherereye hagati ahagana hasi kucyandikishwa(keyboard).
Andika "LED 1" hanyuma ukande buto ya "ENTER".

LED 1⏎

Haba hari umwanya cyangwa ntawuhari hagati ya LED na 1 Ntakibazo.

Noneho andika "RED0" hanyuma ukande "ENTER".

RED0⏎

Itara ntirizimye ahubwo ubonye ubutumwa buvuga ngo "Syntax error".
Ntugire ikibazo! Mudasobwa ntijya irakara rwose.

Noneho andika "ABD" ariko ntukande ENTER.

ABD█

Kanda buto yanditseho "Backspace" inshuro imwe.
Buto yanditseho "Backspace" iri ibururyo bwawe hejuru ku ruhande ku cyandikishwa(keyboard) cyawe.

AB█

Ushobora gusiba inyuguti! Ntugire ikibazo cyuko uri bubure aho wandika.

Gerageza gukora ibi:
1. Andika "ABCDEFG"
2. Gerageza kuzimya itara
3. Gerageza kuzimya watsa itara vuba vuba
4. Andika "BEEP" Hanyuma ukande buto yanditseho "ENTER"
5. Andika "CLS" Hanyuma ukande buto yanditseho "ENTER"

Genzura igihe / WAIT

Reka dukore itegeko ryo "Gutegereza=(wait)" muri IchigoJam.
Agakare kumweru kamyasa muri sikirine(insakazamashusho) gasobanurako
keyboard yiteguye gukoreshwa.

```
WAIT60↵
```

Ese waba warigeze kubura ako gakare kaburaho igihe gitoya? Reka twongere
tubigerageze.

Iyo uhinguye umubare uri imbere ya "WAIT(gutegereza)", igihe cyo gutegereza
kirahinduka.
※ Isegonda 1=60

```
WAIT120↵
```

Agakare uzakubura igihe kinini ugereranyije na mbere. igihe twagenye cyokubura
kagakare ni kinini ugereranyije nicya mbere.

Atsa itara kandi unarizimye muburyo bwikoresha.

```
LED1:WAIT120:LED0↵
```

Use the colon ':'(easy to mistake semicolon ';') to concatenate commands.
"LED1" to light a LED, "WAIT120" to wait 2 seconds, "LED0" to turn off a LED.
Light with "LED1", wait with "WAIT120", turn off with"LED0".

It lights the LED a bit.

```
LED1:WAIT3:LED0↵
```

If you change the number for "WAIT", changes the light pattern of the LED.

The LED lights two times..

```
LED1:WAIT3:LED0:WAIT3:LED1:WAIT3
:LED0↵
```

You can connect more and more with the colon ":".

Try it!
1. Let's do "WAIT" for 10 seconds
2. Light the LED for 5 seconds and turn it off
3. After typing "WAIT 10000", in the middle, press the ESCAPE key
4. Light a bit after lighting for a long time 5. Try to light the LED with a cool pattern

Subiza mu mibare / Injiza(INPUT)

Porogaramu ikora imibare muburyo buhindagurika ukoresheje
"RND(random:budahoraho)".
Koresha "LET" kugirango ubike imibare mububiko kuva kuri A kugeza kuri Z.

```
10 LET A,RND(10)↵
20 LET B,RND(10)↵
30 ?A;"+";B↵
RUN↵
```

Reka noneho porogaramu ikore ubudahagarara, koresha "RUN"!

Bika imibare ukoresheje "INPUT".

```
40 INPUT C↵
50 ?C↵
RUN↵
```

Inyuma ya "?", gira umubare uhandika hanyuma ukande buto ya ENTER.
Umubare uribika muri C!

Kugira ngo urebe igisubizo, Turakoresha itegeko "IF"

```
60 IF C=A+B ?"ATARI"↵
```

Mu gihe ushaka kwerekana ibyatakaye cyangwa ibyo wibagiwe koresha "ELSE"
kugira ngo ubyerekane.

```
60 IF C=A+B ?"ATARI" ELSE ?"HAZU
RE"↵
```

Niba washyizemo interuro ibaza nayo ntakibazo.

```
40 INPUT "KOTAEHA?",C↵
```

Gerageza gukora ibi:
1. Hindura uteranye imibare ibiri(2)
2. Hindura prorogaramu ugire akibazo ukora koroshye
3. Hindura porogaramu ugire ikibazo ukora cyo gukuba imibare
4. Bara igihe gishira uri gusubiza ukoresheje "TICK"
5. Kora umukino wogukina ukanda imibare

Kora imibare - IchigoJam

Reka duhe mudasobwa ikibazo cy'imibare ishobora gukora.
Koresha "PRINT" kugira ngo ugaragaze igisubizo.

```
PRINT 1+1↵
```

Kanda buto ya ENTER, uhise ubona ko igisubizo ari 「2」.

```
PRINT 15-7↵
```

Gukuramo nabyo birashoboka!

Kuri mudasobwa(compiyuta), ikimenyetso cyo gukuba kigaragazwa n'akanyenyeri "*".

```
PRINT 3*5↵
```

Ikimenyetso cyo kugabanya ni akarongo kaberamye "/". (Ikigabanywa ibumoso, Ikigabanya iburyo)

```
PRINT 10/2↵
```

Muby'ukuri, Ushobora gukoresha akamenyetso ko kubaza '?' aho gukoresha "PRINT".

```
?10/3↵
```

Oh? Igisubizo ntabwo aricyo?
Igisubizo nicyo rwose kuri "IchigoJam", kubera ko idakoresha imibare y'ibice.
Kubira ngo ubone imibare yasigaye(ibyasagutse) ukoresha akamenyetso k'ijanisha '%'.

```
?10%3↵
```

Kubera ko 10 kugabanya 3 ari 3 hagasigara 1, uzabona '1' kuko ariryo ryasigaye.

Bwanyuma, reka dukore umubare munini.

```
?1000*100↵
```

Oh!, Yerekanye ibintu utari usanzwe umenyereye kubona.
Mu by'ukuri, IchigoJam ikora imibare iri hagati yo kuva kuri -32768 no kugeza kuri 32767.

Gerageza gukora ibi:
1. Teranya "100+200" ukoresheje IchigoJam
2. Kuba "8*7" Ukoresheje IchigoJam
3. Gabanya "100/25" Ukoresheje IchigoJam
4. Noneho reba imibare isigara iyo tugabanyije "30/8" muri IchigoJam
5. Noneho Korera 100,000,000 ni ukuvuga (10,000*10,000) Ukoresheje IchigoJam

Jyena umwanya / umwanya wo kwandikamo

Reka twerekane umwanya(ahantu) twagennye kwandikamo.
"LOCATE" Yifashishwa mukugena umwanya wo kwandikamo.

```
LOCATE 16,12:PRINT "*"↵
```

Kanda buto yanditseho ENTER, urabona ko aka kamenyetso '*' kagiyemo hagati na hagati.
Bisobanuyeko twandikse kumurongo wa 16 uturutse ibumoso no kuwa 12 uturutse hejuru.

Noneho reka tugaragaze ahantu hatandukanye.

```
LOCATE 25,5:PRINT "*"↵
```

Hindura imibare iri imbere ya "LOCATE", Numwanya wo kwandikamo urahita uhinduka.

Mu byukuri, Ushobora gukoresha impine za "LOCATE" arizo "LC".

```
LC 16,14:PRINT "*"↵
```

Nanone ikimenyetso cyangwa inyuguti ishobora kugaragara ahantu habiri hatandukanye.

```
LC 16,12:PRINT "@":LC 10,10:PRIN
T "*"↵
```

Igisubizo nicyo kigaragara.

```
LC 16,14:PRINT 2+3↵
```

Mugihe ushaka gusiba insakazamashusho(sikirini) yawe, kanda buto ya F1 cyangwa wandike "CLS".

```
CLS↵
```

Gerageza gukora ibi:
1. Erekana "IchigoJam" kuri 20 uturutse ibumoso hamwe ni 10 uturutse hejuru
2. Garagaza kano kamenyetso '@' ku 10 uturutse ibumoso hamwe na 17 uturutse hejuru, nanone kuri 25 uturutse ibumoso hamwe na 18 uturutse hejuru
3. Erekana igisubizo cya "10-5" kuri 15 uturutse ibumoso hamwe na 24 uturutse hejuru
4. Erekana inyuguti cyangwa ikimenyetso ahantu ushaka
5. Erekana igisubizo ushatse ahantu ushaka

Reka duce urubanza(Niba) / IF

Niba Umupira uguciye hejuru wigirayo. Niba ubonye umwubo imbere yawe urasimbuka.
Iyo dushaka ko mudasobwa(computer) ica urubanza(ikora ikintu runaka bitewe n'ikindi) dukoresha iri tegeko "IF(Niba)"

```
10 IF BTN()=0 GOTO 10↵
RUN↵
```

Niba buto yo kuri IchigoJam utayikanze, Porogaramu irasubiramo umurongo wa 10.
Niba ukanze buto yo kuri IchigoJam, porogaramu irahita ijya kumurongo ukurikiraho hanyuma irangire(mbese ihagarare).

Igihe cyose ukanze buto Agatara kazaka guhite kazima.

```
10 IF BTN()=0 GOTO 10↵
20 LED1↵
30 IF BTN()=0 GOTO 30↵
40 LED0↵
50 GOTO 10↵
```

Oh! ese igihe wakandaga buto yo kuri IchigoJam itara ryatse?
Ariko niba mudasobwa yawe yihuta, uzakanda kuri buto itara ryake hanyuma ihite ikomeza kurindi tegeko ako kanya.

Niba udashaka ko ihita ijya kurindi tegeko ako kanya, ongeramo "WAIT".

```
10 IF BTN()=0 GOTO 10↵
20 LED1:WAIT30↵
30 IF BTN()=0 GOTO 30↵
40 LED0:WAIT30↵
50 GOTO 10↵
```

Gerageza gukora ibi:
1. Niba wakanze buto, kora ku buryo mudasobwa ikomeza kumva ko ugikanze kuri buto nubwo waba warekuye.
2. Gera geza guhindura ahari "WIAT30" habe "WIAT60"
3. Gera geza guhindura ahari "WIAT30" habe "WIAT5"
4. Hindura "IF BTN()=1"
5. Kora porogaramu uzajya ukanda buto, itara rigatangira ryaka rimyasa(rizima ryaka).
6. Kora porogaramu ituma itara ryaka ritazima!

Kora amatara ya n'ijoro / GOTO

Amatara amyasa ya n'ijoro, azima yaka mugihe kingana na masegonda zeru n'ibice bitanu(0.5).

```
10 LED1:WAIT30:LED0:WAIT30↵
20 LED1:WAIT30:LED0:WAIT30↵
RUN↵
```

Andika umurongo wa 10, hanyuma uwandukure hasi ku murongo wa "20" ubundi ukande buto yanditseho ENTER.
Hanyuma wameze umurongo wa 20 ukresheje "LISt"

Incuro 30.000 kugeza mugitondo. Kugira ngo rizake izo nshuro zose uzifashisha "GOTO".

```
10 LED1:WAIT30:LED0:WAIT30↵
20 GOTO 10↵
```

"GOTO" ibangaririmo ni ugusimbuka umwisho(iherezo).
> Umurongo wa 10, Rizaka rihite rizima
> Unurongo wa 20, Simbukira(kujya) ku murongo wa 10
Igihe ukanze buto yanditseho ESC nibwo rizazihagarara kwaka rizima.

Kwaka rizima vuba vuba

```
LIST↵
10 LED1:WAIT3:LED0:WAIT3↵
```

Erekane porogaramu ukanze "buto yanditseho F4" cyangwa wandike "LIST".
Hindura ku murongo wa 10, amasegonda 30 uyahindure amasegonda 3, ukande buto yanditseho ENTER hanyuma ukande na buto yanditseho "F5"cyangwa wandike "RUN" ukande ENTER .

```
15 LED1:WAIT30:LED0:WAIT30↵
```

Kora umurongo wa 15 hagati y'umurongo wa 10 nuwa 20.
Rizaka muburyo buhoraho, ryaka umwanya mutoya rikazima hanyuma rikaka umwanya munini rikazima.

Gerageza gukora ibi!
1. Garuka kuri porogaramu y'amatara ya nijoro.
2. Ongera igihe cyo kwaka gusa.
3. Gerageza gutuma ryaka rizima vuba vuba hanyuma rihagarare ari uko rigeze ku ighe cyo kwaka umwanya munini.
4. Kora umurongo w'imibare kuva ku 100 ku mirongo 100.
5. Noneho kora uburyo bwokwatsa itara bwiza hanyuma ugire uwo ubyereka.

Bika porogaramu / Bika/Tangiza/shyashya

Porogaramu yo kwatsa itara. Kugira ngo ubike porogaramu wifashisha "SAVE".

```
SAVE0↵
Saved 30byte↵
OK↵
```

Mu gihe ubonye bugaragaza uko porogaramu ingana hamwe na "OK",
porogaramu iba imaze kubikwa.
IchigoJam ishobora kubika porogaramu zigera kuri enye(4). Ni ukuvuga 0-3

Funga ufungure IchigoJam hanyuma ukore wandike "LOAD" kugirango urebe
niba hari porogaramu wabitse.

```
LOAD0↵
Loaded 30byte↵
OK↵
```

Ubyemeze ukoresheje "LIST". Utangize porogaramu wifashishije "RUN"!

"FILES" igufasha kumenya umubare wa porogaramu umaze kubika.

```
FILES↵
```

Witonda hatagira ikosa ukora ugasiba porogaramu.

"NEW" igufasha kwandika(gukora) porogaramu shyashya.

```
NEW↵
OK↵
LIST↵
OK↵
```

Andika "LIST", Ntakintu nakimwe kigaragara.

Porogaramu ibitse kuri nomero ya mbere niyo izatangire gukora bwa mbere niba
ufunze ugafungura IchigoJam kandi ukanakanda mu buryo ugumishijeho buto iri
kuri IchigoJam.
(Ntakibazo niba udafite TV(televiziyo) cyangwa Keyboard. Ibindi bikoresho bya
elegitolonike birakora ibindi.)

Gerageza!
1. Bika porogaramu yatsa itara inshuro 3
2. Koresha uburyo bwo gutangira yikoresha.
3. Reba ibiba igihe ukoresheje "SAVE" nyuma yo kwandika "NEW"

Kwibuka porogaramu / RUN/LIST

Reka twibuke porogaramu yo kwatsa agatara kazima kaka.

```
10 LED1:WAIT10↵
```

Iyo utangije umubare biba bigaragazako cyangwa utanze itegeko ryo "kwibuka".
Agatara ntabwo gahise kaka ako kanya.
"run" ni itegeko ryo kuryatsa hanyuma ugakanda buto , Itara rihita ritangira kwaka.

```
RUN↵
```

Ahakurikiraho hatangirwa na 20, hanyuma uhongereho muri memori ukanda buto
ya ENTER.

```
20 LED0:WAIT10↵
```

Koresha "RUN" Iguhe ushakako porogaramu wabitse itangira gukora.
Itara rizirongera kwaka aruko ongeye kwandika "RUN"!

Ububiko bwite "LIST".

```
LIST↵
10 LED1:WAIT10↵
20 LED0:WAIT10↵
```

Hagati y'umurongo wa 10 n'uwa 20 ongeramo "WAIT".

```
15 WAIT50↵
```

Emeza ukoresheje "LIST", yikoreshe ukoresheje "RUN"!

Porogaramu zihuje umubare izibika iyo wanditse nyuma.
(Ukabyemeza ukoresheje "RUN" hamwe na "LIST"!)

```
15 WAIT110↵
```

Andika umubare wonyine hanyuma ukande buto ya ENTER, ntakintu
kizagaragara kuri uwo murongo.

```
15↵
LIST↵
```

Gerageza!
1. Koresha buto ya "F5" aho gukoresha "RUN"
2. Koresha buto ya "F4" aho gukoresha "LIST"
3. Kora porogaramu yatsa itara inshuro 2
4. Kora porogaramu yatsa itara mu buryo bwiza bwisubiramo.

Kora Ijwi / BEEP - IchigoJam

Insinga(amaguru) ya gatanga jwi kawe zishyire kuri IchigoJam yawe ahanditse SND na GND.

```
BEEP↵
```

Ese hari Ijwi wumvise?

Ijwi riranguruye.

```
BEEP 5↵
```

Ijwi ryo hasi.

```
BEEP 20↵
```

Ijwi rikomza.

```
BEEP 10,30↵
```

Reka dukore injyana y'umuzika!

```
10 BEEP 5:WAIT 30↵
20 BEEP 20:WAIT 30↵
30 GOTO 10↵
RUN↵
```

WAIT ni itegeko ryo gutegereza. Umuzika wacu uzagenda gakeya turamutse dushyire umubare mu nini imbere ya "WAIT".
GOTO ni itegeko ryo kujya ku murongo uba wanditse imbere yaryo, aha turasubira ku murongo wa 10 kugira ngo dusubiremo porogaramu ubudahagarara. Buto ya "ESC" yifashishwa mu guhagarika porogaramu.

Umuzika uzahagarara ari uko ukanze kuri Buto iri kuri IchigoJam yawe.

```
15 IF BTN() GOTO 15↵
```

Gerageza gukora ibi:
1. Ijwi rihindagurika!
2. Kora injyana y'ijwi riranguruye kandi ryihuse
3. Ongeraho ino prorogaramu: "12 BEEP 20:WAIT 30" Kugira ngo ijwi ryikine inshuro eshatu
4. Kora umuzika ukinwa ishuro enye(4)
5. Hindura progaramu ku murongo wa 15, "GOTO 15" bihindure "GOTO 10"
6. Kora injyana(umuzika) wawe!

Andika umuzika / Kina - IchigoJam

Insinga(amaguru) ya gatanga jwi kawe zishyire kuri IchigoJam yawe ahanditse SND na GND.

```
PLAY"CDE"
```

Ese wumvise umuzika uri munjyana ya DO-RE-MI?

Mu buryo bwa porogaramu, DO-RE-MI-FA-SO-LA-SI byandikwa gutya CDEFGAB.

```
PLAY"CDEFGAB"
```

Ijwi rya munani(Ijwi ryohejuru cyane) rishobora guhinduka "0" hamwe n'undi mubare.

```
PLAY"O4 CDEFGAB O5 C"
```

Ushobora kongera igihe ijwi rimara ukoresheje umubare.

```
PLAY"CDE2"
```

"Kabiri(2)" kanditse aha "CDE2" bishatse kuvugako amajwi yisubiramo ibihe bibiri(2). Ikosa ni ugushyiraho ibihe bine. "8" ni igihe amajwi y'umuzika amara ariko akangana na kimwe cya kane cya manota y'umuzika.
"#" kongera ubunini bw'ijwi, "-" ijwi ryo hasi cyane.

```
PLAY"C C# F-"
```

"R" bivuzengo umutuzo(guceceka). Ushobora guhindura igihe irinota rimara ushyiraho umubare urugero "R2" hamwe n'undi ushaka.

```
PLAY"CRC"
```

"T" bishatse kuvuga tempo. Ushobora kubyandika gutya "T120" bishatse kuvuga bine by'ijana na makumyabiri(120) kugihe kisegonda.

```
PLAY"T240 CDE2 CDE2 GEDCDED2"
```

Gerageza gukora ibi:
1. Kora umuzika "Tulip"
2. Andika "PLAY" mugihe uri gukina umuzika
3. Andika indirimbo(umuzika) "Froggle song"
4. Kina umuzika uri kumwe n'incuti zawe!
5. Noneho andika umuzika ukuye mu ndirimbo wiyandikiye!

Gukuba dukoresheje Umwizenguruko FOR/NEXT(Loop FOR/NEXT) - IchigoJam

```
10 A=5↵
20 FOR I=1 TO A:?"*";:NEXT:?↵
```

Ushobora kubara kuva kuri rimwe kugera kumubare uri muri A wifashishije amabwiriza ya FOR/NEXT. Ubona inyenyeri '*' eshantu(5).

Bihindure noneho ukoreshe imibare wowe ushaka, ukoresheje ibwiriza rya "INPUT".

```
10 INPUT A↵
```

Andika umubare uwo ariwo wose hanyuma ukande buto yanditseho ENTER!

Ongera wandike undi umubare hanyuma itangire gukora umwizenguruko(Loop)

```
15 INPUT B↵
17 FOR J=1 TO B↵
30 NEXT↵
```

Ushobora no gukuba imibare!

Shyira umubare mu bubiko C uwo mubare ube '*'.

```
16 C=0↵
25 C=C+A↵
40 ?C↵
```

Kubera ko C=C+A ushobora kubonako igisubizo kirangana na A x '*' kuri buri muzenguruko. Noneho reka C=C+1 ibi nabyo ntakibazo. Niba c=0 cyangwa ngo ureke C,0, C ijye yiyongera muburyo bukomeza.

Gerageza gukora ibi bikurikira!
1. Sha igisubizo cya 7 gukuba 8
2. 8 gukuba 7 bingana bite?
3. Hindura noneho ikimenyetso(Mark) ukoreshe iyo ushaka
4. Noneho hindura mark(ikimenyetso) ige ku nyuguti ebyiri(2)
5. Noneho reba ibyinjira bingana na zeru(0)

Kora imibare ya Zeru(0) na Rimwe(1) / BIN$

Habaho imibare, inyuguti, ingombajwi, utwitso n'ibimenyetso; Ariko mudasobwa y'umva "Zeru(0)" na "Rimwe(1)" gusa.

Ubusanzwe iyo dufashe 1 tugateranyaho 9 bingana ni 10 aha tuba dufite imibare ibiri. Ariko iyo turi mu mibare ya "1" na "0" gusa, iyo dufashe 1 tugateranyaho 1 bingana ni 10 hanyuma tukaba dufite imibarwa ibiri(2). Iyi niyo mibare ya Zeru(0) na Rimwe(1).

Itegeko twifashisha muri porogaramu kugirango duhindure imibare isanzwe tuzi muri Zeru(0) na Rimwe(1) ni "BIN$".

```
?BIN$(2)↵
10
?BIN$(10)↵
1010
```

Ikimenyetso "`" (Dore uko bakandika muri porogaramu: Ukanda Buto yazanditseho "shift" + "@" cyangwa ugakanda Kuri buto yegereye "rimwe(1)" ibumoso bwawe kucyandikishwa(keyboard) yanditseho "`"); Ubwo ni bwo buryo wakwifashisha ukura imibare muri Zeru(0) na Rimwe(1) uyishyira mu mibare dusanzwe tumenyereye.

```
?`1111↵
15
?`10000000↵
256
```

0,1,2,3,4, ... Bishyire mu mibaee ya zeru na rimwe.

```
FOR I=0 TO 256:?BIN$(I),I:WAIT 3
0:NEXT↵
0    0
1    1
10   2
11   3
```

Mu Mibare ya Zeru(0) na Rimwe(1) tubara "imibarwa".
Ni ukuvuga ngo Gatatu(3) Ni imibarwa ibiri(2) ariyo "11" , Naho 8 ikaba imibarwa ine(4) ariyo "10000".

Gerageza gukora uyu mwitozo!
1. "16" Ingana na kangahe mu Mibare ya Zeru(0) na Rimwe(1)?
2. Hindura iyo mibare ya zeru na rimwe mu mibare isanzwe "101","1010","10100"
3. Noneho "40" ingana gute mu Mibare ya Zeru(0) na Rimwe(1)?
4. Ese ni uwuhe mubare wanyuma munini ushobora kugira imibarwa itanu(5)?
5. "-1" ingana gute mu Mibarwa ya Zeru(0) na Rimwe(1)?

Kwibuka imibare / LET - IchigoJam

Mudasobwa ifite ubushobozi bwogufata mumutwe burenze ubundi bwose,
Ishobora kwibuka imibare yose ibitse muri A kugeza kuri Z!

```
LET A,1190:LET B,2014:LET C,794↵
```

Iyo yerekanye "OK", Iba irangije kubika byose(iba irangije gufata mu mutwe)!

Zimya sikirini(Insakaza mashusho), hanyuma werekane A? B? C?

```
CLS↵
?A↵
?B↵
?C↵
```

Ikoresha "LET" kugira ngo ukerekane aho ugiye kubika, hanyuma ukandika icyo ubikamo.

```
LET B,2017↵
?B↵
```

Ishobora nogukoresha inyuguti aho kwandika imibare.

```
LET C,A+B↵
?C↵
LET C,C+1↵
?C↵
```

Ikicyimenyetse "="(Bihwanye) gishobora kwifashishwa tushaka kwerekanako bingana.

```
C=C+1↵
```

Ijwi rigenda buhoro!

```
10 LET A,1↵
20 ?A:BEEP A:WAIT 10:LET A,A+1↵
30 IF A=10 END↵
40 GOTO 20↵
```

Gerageza gukora ibi:
1. Kora ijwi rigenda buhoro cyane
2. Kora ijwi ryo hejoru cyane(ryihuta)
3. Ibuka umwaka wavutsemo, ukwezi, umunsi hanyuma ubike iyo mibare yose
4. Reka twibuke kandi tugaragaze umubare wakubwe ku kwezi n'umusi wavutsemo
5. Gerageza Ni imibarwa ingahe ushobora kwibukamo

Huza amaporogaramu / LRUN - IchigoJam

IchigoJam ishobora kubika porogaramu zigera kuri enye(4).
Huza izo porogaramu, kuburyo zikorera hamwe(ziba nkaho ari porogaramu imwe)!
Bwa mbere na mbere, Kora porogaramu y'umukino wo kubazwa, Igice kingenzi cy'umukino.

```
10  CLS↵
20  LC10,10:INPUT  "1+1=?",N↵
30  LC12,10:IF N=2 ?"CLEAR!!" ELS
E ?"GAME OVER!"↵
```

Izerekana "Clear" mugihe igisubizo aricyo. naho mugihe igisubizo ataricyo izerekana "Game over".
Bika iyi porogaramu mu bubiko bwa mbere(1).

```
SAVE1↵
```

Kugira ngo uhe iyo porogaramu umutwe, mbere nambere hera hejuru(mbese kuntangiriro).

```
NEW↵
```

Umutwe waprogogaramu uzavamo(uzarangira) mugihe ugize buto ukanda iyo ariyo yose.

```
10  CLS↵
20  LC6,7:?"=MAGICAL  MATH  QUIZ="↵
30  WAIT  60↵
40  LC6,18:?"HIT  ANY  KEY  TO  START
"↵
50  IF  INKEY()=0  CONT↵
```

Ongeraho itegeko rihuza izo porogaramu zombi ari ryo "LRUN".

```
60  LRUN1↵
SAVE0↵
RUN↵
```

Duhuje umukino hamwe n'umutwe wa porogaramu!

Gerageza gukora ibi:
1. Tangiza umukino mu gihe umukino urangiye hamwe na "LRUN0"
2. Hinduta umutwe wa porogaramu
3. Hindura ikibazo(ibazwa)
4. Kora kuburyo bisubira ku mutwe mu gihe umukino urangiye(Game over)
5. Kumukino wa "Kawakudari Game" Shyiraho umutwe(titile) wawo.

Bwira mudasobwa icyo uttekereza / BTN

Reka tubwire Mudasobwa icyo dutekereza dukoresheje buto iba ibumoso kuri IchigoJam.

```
?BTN()↵
```

Kucyandikishwa(Keyboard) iburyo ahagana hasi urahabona buto yanditseho "UP" uyikande inshuro eshatu(3), agakare kumweru gatera(cursor) karava aho kari kari; kanda ugumisheho kuri buto iri kuri IchigoJam hanyuma ukande buto ya Enter.

Niba ubonye rimwe "1" byakunze!

' Koresha itegeko rya "GOTO" kugirango usubiremo porogaramu.

```
10 ?BTN()↵
20 GOTO 10↵
RUN↵
```

Urabona Zeru "0" ku murongo, Reaka noneho ukande buto cyangwa ukureho gukanda buto.
Kugira ngo bihagarare kanda buto yanditseho "ESC"..

Porogaramu idufasha kwatsa itara aruko dukanze buto.

```
10 LED BTN()↵
20 GOTO 10↵
```

Ushobors gukanda buto yanditseho "F5" nayo ni ikora kimwe no kwandika itegeko rya "RUN".
Itegeko ryatsa itara ariryo "LED", Itara rizako uko hiyanditse 1 hanyuma rizime ari uko hiyanditse 0; Itara rizaka ari uko ukanze buto yo kuri IchigoJam.
Kanda buto ya ESC kugirango uhagarike porogaramu.

Kanda buto itara ryake rimyasa vuba vuba!

```
10 LED 1:WAIT 10-BTN()*5↵
20 LED 0:WAIT 10-BTN()*5↵
30 GOTO 10↵
```

Itegeko "WAIT" ryifashishwa mu gutegereza.
Mu gihe utakanze buto, porogaramu irategereza igihe kingana na madakika 10 "WAIT 10".
Niba wakanze buto, BTN() izaba 1, ni ukuvuga ngo tuzafata 10 dukuremo 1 dukubyeho 5(10-1*5). Izategereza amadakika 5 " WAIT 5".
Hanyuma isubire ku murongo wa 10 dukoreshekje "GOTO", ibisubiremo kenshi..

Gerageza gukora ibi bikurikira!
1. Kora kuburyo itara rimyasa vuba vuba mugihe ukanze buto.
2. Kora kuburyo itara rimyasa gahoro mugihe ukanze buto.
3. Hindura porogaramu, itara ryake ubutazima mugihe ukanze buto.
4. Hindura progaramu itara ntiryake mu gihe ntabuto wakanze.

Kora utuduse(rudo) / RND

Kora utuduse duhindagurika!

```
?RND(3)↵
```

Ni uwuhe mubare ugaragaye?
RND(Bufatiyeho) akaduse kaba gafite ahantu hari umubare ungana n'uwo
twashize mudukubo.

Ongera wandike nkuko wanditse hejuru hanyuma ukande ENTER!

```
?RND(3)↵
```

Ese umubare wahindutse ugereranyije n'uwo wabonye bwa mbere?
Oh? Ariko ntiwigeze ubona gatatu?
Bisabanuyeko imibare itatu(3) kuva kuri 0 iriyo igaragara.
Niba umubare uri mudukubo ari gatatu, Bishatse kuvuga ko ari 0,1,2.

```
?RND(5)↵
```

Ushobora guhindura umubare uri mudukubo.

Ntushaka kubona zeru!
Ushaka ko umubare muto uba ari 1 mu mibare igaragara!
Kora muri buno buryo ...

```
?RND(3)+1↵
```

Ni byiza!
Iyo wongeyeho 1 kuri 0 kandi ariwo mubare mutoya, biba bishatse kuvugako
umubare mutoya uba ari 1.

```
?RND(3)+3↵
```

Ushobora guhindura umubare mutoya ugaragara.

Gerageza gukora ibi bikurikira:
1. Noneho erekana umubare ari wo wose hagati yo kuva kuri 0 kugeza kuri 6
2. Noneho erekana umubare ari wo wose hagati yo kuva kuri 1 kugeza kuri 6
3. Noneho erekana umubare ari wo wose hagati yo kuva kuri 10 kugeza kuri 20
4. Noneho kora akaduce kerekana imibare wowe ushaka

Kora Inyuguti cyangwa ikimenyetso gishya / PCG - IchigoJam

Kugira ngo ubone "Ipusi(cat)" kanda icyarimwe buto yanditseho "Alt" y'ibumoso hamwe na buto yanditseho "C".

```
?CHR$(236)↵
```

Ikimenyetso cy'ipusi ushobora kukibona ukoresheje imibare 236.

Ushobora guhindura "ipusi" ikaba "akarongo gahagaze".

```
POKE 236*8,8,8,8,8,8,8,8,8↵
```

Yahindutse?
Aka kanya, tugiye guhinduramo agapira gatoya.

```
POKE 236*8,0,0,0,24,24,0,0,0↵
```

Umurong uberamye!

```
POKE 236*8,1,2,4,8,16,32,64,128↵
```

Porogaramu yo kwandika udushushanyo dukoresheje imibare ya zeru na rimwe.

```
10 POKE236*8+0,`01111110↵
11 POKE236*8+1,`11011011↵
12 POKE236*8+2,`11111111↵
13 POKE236*8+3,`11000011↵
14 POKE236*8+4,`11111111↵
15 POKE236*8+5,`11111111↵
16 POKE236*8+6,`00011000↵
17 POKE236*8+7,`00011000↵
RUN↵
```

Ubonye Mr. Ice!

Niba ushaka kugaruka ku ipusi watangiriyeho, koresha "CLP"(clear pattern).

```
CLP↵
```

Gerageza gukora ibi bikurikira:
1. Kora akamenyetso ku mutima
2. Kora ikimenyetso ushaka
3. Kora ikivejuru(Alien) ukoresheje ALT+D cyangwa uhindura 236 ikaba 237(Kugeza 224-255!)
4. Erekana imibare ya zeru na rimwe "?`10000000"
5. Kora Ikimenyetso cy'umwimere ukoresheje porogaramu igizwe n'imurongo umwe.

Kora isaha y'ifashishwa kubara igihe(stopwatch) / TICK

1,2,3,4,5,6...
Ishuro 60 mu gihe kisegonda, komeza kubara igihe wifashishije IchigoJam.

```
?TICK()↵
```

Uwo mubare uba ari "TICK". Reka twerekane ibihe byinshi.

```
?TICK()↵
```

Umubare werekanywe bwa kabiri ni munini ugereranyije n'uwa mbere.

```
?TICK()/60↵
```

Ugabanyije 60, urahindura amadakika uyashyira mu masegonda.

Itegeko "CLT(clear timer)", Ryifashishwa mukongera gutangira kubara.

```
CLT↵
OK↵
?TICK()/60↵
```

Ishobora kumenya igihe mu gihe mwayitangije.

Stopwtch ibara igihe mu gihe iri gukora "RUN" ukanze buto iri kuri IchigoJam, ku isogonda.

```
10 CLT↵
20 IF BTN()=0 GOTO 20↵
30 ?TICK()/60↵
```

Izategerereza ku murongo wa 20 kugeza igihe uzakandira buto.

Kora stopwatch igaragaza igihe buri uko ukanze buto.

```
40 IF BTN()=1 GOTO 40↵
50 GOTO 10↵
```

Gerageza gukora ibi bikurikira:
1. Reka tubare igihe ushobora kumara uri kwayura.
2. Ufunga amaso, hanyuma ukande buto mugihe cya masegonda atanu(5).
3. Siba "/60" kumurongo wa 30 hanyuma ubare umuvuduko uri gukoresha ukanda buto.
4. Bika porogaramu wifashishje "SAVE0", hanyuma zimya, wongere ufungure IchigoJam mugihe ugikanze buto, irahita itangira ako kanya, noneho kanda buto burikanya!
5.Noneho bihindure kuburyo uzajya utangira ukanda buto hanyuma ikaragaza amasegonda.

Guteranya kuva kuri 1 kugera ku 100 - IchigoJam

Ukoresheje "?", Baza mudasobwa "1+1".

```
?1+1↵
```

Kanda buto ya "ENTER" urabona igisubizo ko ari "2", "1+2" Ni kangahe?

```
?1+2↵
```

Ese ukanze buto inshuro zingahe?

```
?1+2+3+4↵
```

Inshuro 10.
Ese wabigenza ute ushaka kongera ho undi mubare kuri iyo ngiyo umaze guteranya?
Ukoresheje buto yo kuzamuka/gutambika ibumoso cyangwa iburyo, ushobora guhindura uwo murongo wo hejuru.
Kanda "+5" uteranyeho gatanu, Hanyuma kanda buto ya "ENTER".

```
?1+2+3+4+5↵
```

Igisubizo ni kangahe uramutse uteranyije kuva kuri 1 kugeza ku 10 gutya?
Uteranyije 1 kugeza ku 10 ukoresheje ubu buryo, igisubizo ni kangahe?

```
?1+2+3+4+5+6+7+8+9+10↵
```

Guteranya kuva kuri 1 kugeza ku 100 burasa n' ibikomeye cyane.
Ariko ukoresheje uburyo bw'itegeko biroroshye, Itegeko "FOR". Dore uko rikoreshwa:

```
FOR  I=1  TO  100:?I:NEXT↵
```

Himba ububiko iyo mibare iri bwibikemo aribwo turibwite "A". Hanyuma duteranye, leka iyo mibare igende yiteranya kuva kuri 1 kugeza ku 100.

```
A=0↵
OK↵
FOR  I=1  TO  100:A=A+I:NEXT↵
OK↵
?A↵
5050↵
```

Gerageza gukora uyu mwitozo:
1. Guteranya kuva kuri 1 kugeza kuri 12, Igisubizo ni kangahe?
2. Guteranya kuva kuri 1 kugeza kuri 20, Igisubizo ni kangahe?
3. Guteranya kuva kuri 1 kugeza kuri 200, Igisubizo ni kangahe?
4. Guteranya kuva kuri 1 kugeza kuri 300, Igisubizo ni kangahe?
5. Ese ni ukugeza k'uwuhe mubare ushobora guteranya ukabona igisubizo?

Gukuba(Imibare) - IchigoJam

Reka twerekane imibare kuva kuri 1 kugeza 100.

```
10 FOR X=1 TO 100
20 ?X
30 WAIT 3
40 NEXT
```

Ukoresheje Itegeko rya "FOR" cyangwa "NEXT" ushobora kongenda wongeraho 1 mu bubiko X kurinda ugeze ku 100.

Reka dukore mpara ya gatatu(3). Twifashishije iki kimenyetso "%" gisobanura ibyasagutse tugiye gukora mpara ya Gatatu,
ni tugera ku kumubare twakubaho Gatatu(3) bikarenga 100 duhagarare turerekana ibisubizo.
(Ni ukuvuga imibare igabanyika na gatatu kuva kuri 1 kugera ku 100 niyo turi bwerekane)

```
20 IF X%3=0 ?X
```

Noneho reka dukore mpara ya Gatanu(5), Twifashishije "OR" bisobanura *byose* (Ivanze na mpara ya Gatatu(3))

```
20 IF X%3=0 OR X%5=0 ?X
```

Igihe twerekanye mpara ya Gatatu hamwe ni ya Gatatu tugoresheje "AND" bisobanura *byombi* tuzabona iki?

```
20 IF X%3=0 AND X%5=0 ?X
```

Tuzabona igisubizo kizo mpara zombi uzikubanyije(Igisubizo cyamara ya Gatatu ugikubyeho mpara ya Gatatu).
Umubare uzagaragara bwa mbere ni 15, ni wo mubare wambere wizo mpara zombi uzikubanyije.

Noneho reka turebe igikubo cyabo byombi dufashe mpara ya 2,3 ni ya 5.

```
20 IF X%2=0 AND X%3=0 AND X%5=0
?X
```

Dukubanyije zo mpara zombi uko ari eshatu (3) tubona ko umubare wa mbere ukanaba n'uwanyuma hagati yimibare 100 Jam ari 30.

Gerageza gukora ibi:
1. Erekana mpara ya 7
2. Erekana mpara ya 13
3. Erekana mpara ya 7 ni ya 13 byombi
4. Erekana igikubo cyabyo byombi mpara ya 7 ni ya 13
5. Reka noneho twihuse tubare imibare iri hagato ya 1 ni 1000 dufashe igikubo cyabyo byombi mpara ya 3 ni ya 7.

Kugabanya(Imibare) - IchigoJam

Ni iyihe mibare igabanyika 182?

```
10 N=182
20 FOR X=2 TO N-1
30 IF N%X=0 ?X
40 NEXT
```

Itegeko "FOR" cyangwa "NEXT", Mugihe wongereye ububiko X bukava kuri 1
ivuye kuri 2 hanyuma ukabisubiramo.
Igisubizo ni OK igihe "N=182" ukayishyira "LET N, 182"

Leka turebe "ikigabanywa", umubare turibubone.

```
?182%91
0
?182%26
0
```

Uragabanyika neza cyane!

Ni uwuhe mubare ushobora kugabanya 455? What is the number that can divide
455?

```
10 N=455
```

Turabona umubare ushobora kugabanya icyarimwe 182 hamwe 455

```
10 N=182:M=455
20 FOR X=2 TO N-1
30 IF N%X=0 AND M%X=0 ?X
40 NEXT
```

7,13 na 91 niyo mibare igabanya 182 hamwe na 455.
Umubare munini ushobora kugabanya 182 na 455 ni 91.

Gerageza gukora ibi!
1. Garagaza imibare "igabanya byombi" 3432 na 2002
2. Gabanya 3432 n'umubare "munini ushobora kubigabanya byombi"
3. Igisubizo ubonye kuri kabiri(2) gikubeho "umubare munini ubigabanya byombi"
(3432 na 2002)
4. Noneho bara imibare ishobora "kugabanya" 2002
5. Reba umubare "wa mbere" udafite iikigabanya mu mibarwa ine(4)
6. Reka Twemezeko ntamubare ugabanya hose uri hagati y'imibare yambere

Koroshya imibare y'ibice - IchigoJam

Tworoshye tujya hasi!
40 ingana na 40.44 ikangana 40.45 nanone ni 40.49 ni 40.
Ni ukoroshya imibare y'ibice(rounding down).

```
?44/10↵
4↵
```

Mu gihe ari imibare y'uzuye ushaka, iyo ugabanyije ni 10 bingana na 4 aho kuba 4.4.

```
?44/10*10↵
40↵
```

Iyo ugabanyije ni 10 hanyuma ugakubaho 10, uba umaze gukora round down(koroshya ugana hasi)!

reka noneho tworoshye tujya heju!
49 ni 50.45 ni 50.44. 44.41 nanone ni 50.40 ni 40.
Ni round up(koroshya imibare ujya heju).

```
?44/10*10+10↵
50↵
```

nyuma ya rounding down, ese ushobora gukora round up wongeraho 10?

```
?40/10*10+10↵
50↵
```

Oh! byiza, 40 yahindutse 50. Reka noneho duce urubanza ahantu hamwe.

```
10  INPUT N↵
20  LET M,N%10↵
30  ?M↵
```

Muri IchigoJam BASIC kugirango ubone ibyasigaye(remainder) wifashisha "%".
niba hamwe habaye 0, ubwo byabaye round down, hanyuma niba habye 1 cyangwa hejuru yaho ni ukuvugako habayeho round up.

```
40  IF  M=0  ?N/10*10↵
50  IF  M>=1  ?N/10*10+10↵
```

Gerageza!
1. Wifashshije porogaramu kora round up ya 72
2. Kora porogara noneho ikora "rounding off" izajya ikora round down niba igice kinyuma ari 4 cyangwa musi yawe, nanone igakora rounr up niba ari 5 cyangwa hejuru yawo.
3. Noneho emezako izajya ikora round up ahantu hamwe niyo byaba ari "?(N+9)/10*10"
4. Kora porogaramu izajya ikora rounding off ahantu hamwe

Reka tuganirire ku impuzamikorere(Network)!

Ufite IchigoJam ebyiri(2), Fata imigozi itatu(3). Zihuze(IchigoJam) muri ubu buryo:

IchigoJam1		IchigoJam2
GND(ground/0V)	——	GND(Ground/0V)
TXD(transfer)	——	RXD(receiver)
RXD(receiver)	——	TXD(transfer)

※ WItonde! Uramutse uhuje IchigoJam nabi zishobora kwangirika.

Kuri IchigoJam Ya Mbere: Andikamo ibi bikurikira:

```
?"LED1⏎
```

Ni iki kibaye kuri IchigoJam ya kabiri?
Niba bidakoze reba neza niba insinga zibihuza zimeze neza.

```
?"LED0⏎
```

Reka noneho twohereze ubutumwa.

```
?"HELLO⏎
```

Ubone ubutumwa bukubwirako hari ikosa "Syntax erro" kandi bukomeje kuza ni ukuberako ijambo "HELLO" ntabwo riri mumategeko cyangwa amabwiriza ya IchigoJam. IchigoJam ya mbere izohereza ikosa kuri IchigoJam ya kabiri, IchigoJam yakabiri nayo yohereze irindi.
Comokora urusinda ruva kuri TXD rujya kuri RXD kugirango ubihegarike.

REM Hamwe "'" ni amategeko cyangwa amabwiriza yifashishwa mu kubihagarika nanone.

```
?"'HELLO⏎
```

Gerageza!
1. Ganirira kuri IchigoJam
2. Comokora insinga zose hanyuma wongere uzicomeke
3. Gerageza noneho gukoresha insinga ebyiri(2)
4. Genzura mudasobwa y'incuti yawe binyuriye mu impuzamikorere(Network)
5. Noneho shaka igitekerezo cy'ukuntu mwakora umukino binyuriye ku impuzamikorere(Network)

Ibazwa ry'Imibare - IchigoJam

Iyo ni imibare mu kinyarwanda, ururimi rw' Abnyarwanda.

```
10 LET[0],"ZERU","RIMWE","KABIRI
","GATATU","KANE","GATANU","GATA
NDATU","KARINDWI","UMUNANI","ICY
ENDA","ICUMI"↵
RUN↵
```

Ni gute wakwerekana imibare mu magambo?

```
?STR$([1])↵
```

Reka mudasobwa ibare ijya hasi(imanuka)!

```
20 FOR I=10 TO 0 STEP -1↵
30 ?I,STR$([I]):WAIT60↵
40 NEXT↵
```

Umukino wa Mbere(1): Subiza umukino w'imibare!

```
20 N=RND(11):?STR$([N]);↵
30 INPUT ". What's this?",M↵
40 IF N=M ?"Correct!" ELSE ?"Wro
ng. The answer is ";N↵
50 GOTO 20↵
```

Umukino wa Kabiri(2): Andika kugira ngo usubize umukino w'imibare!

```
20 N=RND(11):?"Type ";N↵
30 FOR I=0 TO LEN([N])-1↵
40 IF INKEY()!=ASC([N]+I) CONT↵
50 ?STR$([N]+I,1);:NEXT:?↵
60 GOTO 20↵
```

Gerageza!

1. Ongeraho kode zo kurangiza umukino mugihe umukino wa mbere(1) upfuye.
2. Ongeraho kode za manota ku mukino wa mbere(1)
3. Nyuma yo gusubiza inshuro icumi(10) erekana igihe ku mukino wa mbere(1)
4. Ongeraho "kurangiza umukino(GAME OVER)" ku mukino wa Kabiri(2) igihe utasubije(utanditse)
5. Hindura ururimi, ukoreshe urundi.

Umukino wa Janken

Janken ni umukino w'Abayapani wo kurwanisha ibiganza bakoresheje ibimenyetse bitatu(3) by'ibiganza.
- Gu: (Urutare) Biroroshye funga igipfusi hanyuma ukizamure bwa mbere. (Gu itsinze Choki)
- Choki: (Umukasi) koresha intoki ebyiri(2) izindi uzifunge zikore ishusho nk'iy' Umukasi. (Choki itsinze Pa).
- Pa: (Urupapuro) fungura ikiganza cy'ubamye(mu ikiganza hareba hasi). (Pa itsinzwe Gu)

Koresha itegeko rya random rifite umubare 3 niba dushaka guhitamo Gu, Choki cyangwa Pa dukoresheje Mudasobwa.

```
?RND(3)↵
```

Urugero: O isobanura Gu, 1 risobanura Choki naho 2 gasobanura Pa.

```
10  LET  A,RND(3)↵
20  IF  A=0  ?"GU"↵
30  IF  A=1  ?"CHOKI"↵
40  IF  A=2  ?"PA"↵
RUN↵
```

Andika RUN cyangwa ukande buto ya F5 mu buryo bukurikirana(wongere uyikande)!
Kanda buto ya F5, unavuge ikimenyetse cy'icyiganza cyawe cyo kurwana nyuma yo guhamagara "Jan ken".

Gerageza guca urubanza wifashushuje mudasobwa.

```
15  INPUT  "YOUR  HAND?",B↵
16  IF  B=0  ?"GU  -  ";↵
17  IF  B=1  ?"CHOKI  -  ";↵
18  IF  B=2  ?"PA  -  ";↵
50  IF  A=B  ?"DRAW"↵
60  IF  A-B=1  OR  B-A=2  ?"WON!"↵
70  IF  B-A=1  OR  A-B=2  ?"LOST!"↵
```

Gerageza gukora ibi bikurikira:
1. Gerageza kurwana na porogaramu iri muri mudasobwa ya mugenzi wawe(incuti yawe).
2. Gerageza gukora mudasobwa igenda gahoro!!
3. Gerageza gukora umukino wa Janken ugizwe na bakinnyi batatu(3), wowe hamwe n'izindi mudasobwa 2!

Umukino wa Kawakudari - IchigoJam

Umukino wa Kawakudari ni umukino ukina wigizayo ibikubangamira hanyuma ukamanuka ujya kumugezi.
Mbere na mbere, Inyuguti yawe.

```
10 CLS:X=15↵
20 LC X,5:?"O"↵
RUN↵
```

※ 「"」 Kands buto yanditseho SHIFT hamwe n'iyanditseho 「'」 icyarimwe.

「?」 kanda buto yanditseho SHIFT hamwe n'iyanditseho 「/」 icyarimwe.

Inyuguti y'umwanzi iri kugaragara(Uko imeze).

```
30 LC RND(32),23:?"*"↵
```

※ 「(」 「)」 Kands buto yanditseho SHIFT hamwe n'iyanditseho 「8」 「9」 .
Hanyuma kanda buto yanditseho F5(Kimwe no kwandika "RUN") incuro nyinshi.

Muri porogaramu bisubiremo.

```
40 GOTO 20↵
```

Kanda buto ya ESCAPE uhagarike porogaramu hanyuma wongeremo "wait".

```
35 WAIT 3↵
```

Kugira ngo ubashe kujyana ibumoso cyangwa iburyo.

```
36 X=X-BTN(28)+BTN(29)↵
```

Ongeraho itekeko ryo gukanda ukarangiza umukino!

```
37 IF SCR(X,5) END↵
```

Gerageza gukora ibi:
1. Hindura umuvuduko
2. Hindura inyuguti yawe(Kanda Buto yanditseho ALT hamwe n'imwe muri buto yanditseho A cyangwa V)
3. Noneho ongera imbogamizi(Urugero: "**")
4. Tekereza umukino w'inkuru
5. Reba ibyangiza(utuntu twimbogamizi)
6. Tekereza uko wadusiba

Kwandika vuba vuba

Kwandika vuba vuba ni ukwandika utareba ku cyandikishwa(Keyboard) vuba vuba! Birashimishije! kandi ni na byiza!

```
10  S="JKL"↵
20  CLT:FOR I=1 TO 10↵
30  N=RND(LEN(S)):C=ASC(S+N)↵
40  ?CHR$(C)↵
50  K=INKEY():IF K=0 CONT↵
60  IF C<>K ?"MISS!":END↵
70  NEXT:?TICK()/60↵
```

Shira ututoki mukuru wa meme(urubanziriza musumba zose uvuye kugikumwe) ku kiganza kiburyo kuri "J", urutoki rwa musumba zose urushyire kuri "K" hanyuma urutoki rwa mukubitarukoko(Rubanziriza agahera) urushyire kuri "L". Andika vuba vuba J,k cyangwa L muburyo bufatiweho.
Ese ushobora gukanda inshuro 10 ntakosa ukoze? Mu gihe kingana na masegonda 8!

Nyuma yo gusiba, Reka twongereho izindi nyuguti nkeya.
Urutoki rubanziriza musumba zose(mukuru wa meme) rwo kukiganza cy'ibumoso rushyire kuri "F".
Ese ushobora kwandika "FJKL" mugihe kingana na masegonda 8?

```
10  S="FJKL"↵
```

Urutoki musumba zose rwo kukiganza cy'ibumoso rushyire kuri "D", urutoki rubanziriza agahera rushyire kuri "S" hanyuma urutoki rwa gahera urushyire kuri "A".
Ubu nibwo buryo bugufasha kwandika vuba vuba!

```
10  S="ASDFJKL"↵
```

Gerageza gukora uyu mwitozo!
1. Andika "ASDFJKL" mugihe kingana na masegonda 8
2. Ongeraho "H" ukoresheje urutoki rubanziriza musumba zose(Mukuru wa meme) ku kiganza cy'iburyo
3. Ongeraho "G" ukoresheje urutoki rubanziriza musumba zose(Mukuru wa meme) ku kiganza cy'ibumoso
4. Andika "ZXCVBNM" ziri ahagana hasi kucyandikishwa(keybeard)
5. Ongeraho "QWERTYIOP" ziri hejuru
6. Andika inyuguti zose mu gihe kingana na masegonda 8

```
Q W E RT YU I O P
A S D FG HJ K L ;
Z X C VB NM , . /
```

Umukoro w'imbonerahamwe yaburi rutoki

Umukino wo kwandika imibare

Umukino wo kwandika izina(Andika izina ryawe ku murongo wa 20!)

```
10  CLS
20  ?"TAISUKE FUKUNO"
30  CLT:P=0
40  C=SCR(P,0)
50  IF C=0 ?:?TICK()/60:END
60  IF INKEY()<>C CONT
70  ?CHR$(C);:P=P+1
80  GOTO 40
```

Wabonye iryo wakoresheje?

Hindura umukino w'inyuguti ube ABC!

```
10  FOR I=1 TO 10:?CHR$(65+RND(3)
);:NEXT
```

Ese ushobora kuwuhagarika mu gihe kingana na masogonda rya 20?

Hindura umukino ube umukino wo kwandika imibare!

```
20  FOR I=2 TO 5:?RND(256);",";:N
EXT:?RND(256)
```

Ese ushobora kuwuhagarika mu gihe kingana na masogonda rya 10?

Ni gute amanota yagaragara hejuru y'imubare y'ibice?

```
T=TICK():?T/60;".";T%60/6
```

Hashize isegonda rimwe nyuma yakitso, rangiza umukino.

Gerageza gukora ibi:
1. Hindura umukino wokwandika amagambo uko ushaka
2. Iga ijambo rikomeye ryo mucyongereza wifashishije umukino wo kwandika
3. Hindura umukino ube uwo kwandika imibare ya zeru na rimwe
4. Hindura umukino ube uwo kwandika inyuguti ushetseiyo ari yo yose
5. Hindur umukino ube uwo kwandika emogi

Umukino wo Gusimbuka

Umukino wo gusimbuka ni umukino wo gukina usimbuka(ukwepa) abanzi.
Inyuguti yambere iragaragara!

```
10  CLS:Y=15:V=0↵
20  LC  0,Y:?"M"↵
```

Iyo ukanze buto iyo ari yo yose, urasimbuka!

```
30  IF Y=15 V=3*(INKEY()!=0)↵
40  Y=Y-V:V=V-1↵
50  SCROLL LEFT↵
60  GOTO 20↵
```

Kuraho inyuguti y'umwanzi.

```
25  IF  RND(10)=0 LC  31,15:?"K"↵
```

Hindura umuvuduko.

```
35  WAIT  4↵
```

Noneho ongeraho itegeko rirangiza umukino, urarangiye!

```
37  IF  SCR(1,Y)  END↵
```

Gerageza gukora ibi:

1. Hindura Inyuguti y'ibanze ibe "R"
2. Inyuguti y'ibanze, Kanda ugumisheho kuri buto yanditseho ALT hanyuma ihindike "R"
3. Hindura "RND(10)" bihinduke "RND(4)"
4. Noneho Gabanya inyuguti z'umwanzi
5. Hindura umuvuduko ube mwishi.
6. "V=3*" hahindure habe "V=4*"
7. Gabanya imbaraga zo gusimbuka
8. Ongeraho amanota ukoresheje "CLT" hamwe na "TICK()"
9. Noneho reka amanota ahinduke incuro na simbutse
10. Garuka kumukino watangiriyeho, uhindura ibyo wari wahinduye.

Umukino Nekonikoban - IchigoJam

Kumurongo wa 10 uhagaze n'uwa 5 utambitse hazagaragara agapusi. (kode 2536, ALT+C nizo zako)

```
10  CLS:X=10:Y=5
50  LC X,Y:?CHR$(236)
```

Kora kuburya gagenda nkakaro ngo kaba muri sikirini kerekana aho ugiye kwandika(cursor).

```
20  K=INKEY()
30  X=X-(K=28)+(K=29)
40  Y=Y-(K=30)+(K=31)
60  WAIT10
70  LCX,Y:?"  "
80  GOTO20
```

Tema(fata) udukaboni(utuntu tugenda muri sikirini yawe), hanyuma wongere amanota(S).

```
15  S=0:FOR I=1 TO 10:LOCATE RND(
30),RND(20):?CHR$(245):NEXT
45  IF SCR(X,Y)=245 S=S+1:LC0,0:?
S
```

Rangiza umukino mu gihe kingana na masegonda 10.

```
7  CLT
47  IF TICK()>600 END
```

Gerageza gukora ibi bikurikira:
1. Erekana "urutonde(LIST)"
2. Shyiramo udukobani twinshi.
3. Kora ku buryo umukino urangira mu masegonda 5
4. Kora ku buryo umukino wihuta cyane
5. Noneho kora ku buryo amanota yiyongera kutuntu 10
6. Hindure uko ubishaka hanyuma ubike iyo porogaramu.

Umukino w'Udupuzile(Puzzle) icyenda - IchigoJam

Udupizile ni utunyempande 1 kugera 8 kandi dupanze neza.

```
10 CLS:FOR I=0 TO 7:LC I%3,I/3:?
I+1:NEXT↵
```

Subiramo kuva 0 kugera kuri 7, Garagaza uko kwisubiramo kwarangiye.
("%" ka gufasha gushaka ibyasagutse)

Hindura ameza(panel) ukoresheje akerekana aho ugiye kwandika.

```
20  X=2:Y=2↵
30  LC X,Y:?"*"↵
40  K=INKEY():GOSUB 60↵
50  GOTO 30↵
60  LC X,Y↵
70  X=X-(K=28)*(X>0)+(K=29)*(X<2)
:Y=Y-(K=30)*(Y>0)+(K=31)*(Y<2)↵
80  ?CHR$(SCR(X,Y)):RETURN↵
```

("GOSUB" Ni kimwe na "GOTO" ishyirwa aho ushaka gusubira inyuma
ukoresheje "RETURN")

Reka ikore kugera kunshuro 200.

```
25 FOR I=1 TO 200:K=RND(4)+28:GO
SUB 60:NEXT:CLT↵
```

(Bisubiremo ukoresheje "RND" kugira ngo ubone calater!)

Garagaza urubanza niba ari ugusiba cyangwa gusiba igihe!

```
35 F=0:FOR I=0 TO 7:F=F+(SCR(I%3
,I/3)=I+49):NEXT:IF F=8 LC0,4:?"
CLEAR! TIME:";TICK()/60;"s":PLAY
"O5E16E":END↵
```

Gerageza gukora ibi:
1. Hindura imibare
2. Noneho ongeraho ijwi ryo gutangiza umukino
3. Kina ijwi mugihe igiye
4. Kora ku buryo itara rimyasa igihe usibye
5. Noneho ongeraho kubika amanota yabaye menshi no kuyagaragaza

Ikigereranyo cy'abaturage

Abaturage b'Ubuyapani ni miriyoni 125,13. Mu gihe kingana n'umwaka bagabanukaho abaturage 270,000.
(2016.11 Ministry of Internal Affairs and Communications, Statistics Bureau, Population Estimate)

```
10  P=12536
20  D=27
```

Shyira abaturage muri "P", Hanyuma umubare wabagabanuka nk'umubare ibihumbi icumi muri "D".

Niba bakomeje kugabanuka gutyo nkuko bimeze mu mwaka wa 2016, Abaturage bo mu mwaka wa 2100?

```
30  FOR Y=2016 TO 2100
40    ?Y,P;
50    ?
60    P=P-D
70  NEXT
```

Reka tubishyire ku mbonerahamwe('/' iki ni icyimenyetso cyo kugabanya)

```
42    FOR I=0 TO P/1000
45    ?"*";:NEXT
```

Niba se umubare wabagabanuka wiyongereyeho 20,000 buri mwaka?

```
55    D=D+2
```

Gerageza gukora ibi:

1. Ukoreshe buto yanditseho ESC uhagarike porogaramu hanyuma urebe abaturege bo muri 2060
2. Shyira umubare wabagabanuka kuri 30,000 buri mwaka
3. Hindura inyuguti(ikimenyetso) '*' kugishushanyo kibe indi nyuguti(Ikimenyetso)
4. Hindura umubare uri kumurongo wa 42, 1000 ugihinduremo 100
5. Ongeera umubare w'abaturage
6. Isi ituwe n'abaturage biriyoni 7.3. Byazagenda bite niba ikomeje kwiyongeraho abaturage miriyoni 100 buri kwezi?

Ni uwuhe munsi wavutseho?

Ni uwuhe munsi w'icyumweru wavutseho? Umwaka, ukwezi n'Itariki?
Mu byukuri, ushobora kubishakisha(kubikora) wifashishije porogaramu.
Mbere na mbere, Porogaramu yerekana umunsi.

```
10 LET[0],"SUN","MON","TUE","WED
","THU","FRI","SAT"↵
RUN↵
?STR$([0])↵
```

Kugirango werekane ijambo ryambere(ritangira)[0], Koresha "STR$".

Subiramo iminsi 7 igize icumweru kuva kucyumweru kugera kuwa gatandatu.

```
FOR I=0 TO 22:?STR$([I%7]):NEXT↵
```

Kugirango ushyire umwaka ahari "Y" cyangwa ukwezi ahari "M" cyangwa Itariki
ahari "D", koresha "INPUT".

```
20 INPUT"Y?",Y↵
30 INPUT"M?",M↵
40 INPUT"D?",D↵
RUN↵
```

Reka noneho twerekane umwaka, ukwezi hamwe n'itariki tumaze gushyiramo.

```
?Y,M,D↵
```

Folomire ya Zeller yifashishwa mu gukora(gushaka) umunsi w'icyumweru
wavutseho muri uwo mwaka hamwe n'ukwezi n'itariki.

```
50 IF M<3 M=M+12:Y=Y-1↵
60 H=(Y+Y/4-Y/100+Y/400+(13*M+8)
/5+D)%7↵
70 ?STR$([H])↵
```

Birashimishije kumenya umunsi w'icyumweru wavutseho!

Gerageza!

1. 今日の日付を入れて曜日を確認しよう

2. Ni uwuhe munsi nzizihirizaho ivuka?

3. Ni uwuhe munsi nzizihirizaho ivuka ubutaha?

4. Erekana umunsi wifashishsije katakana

5. Noneho kora iyerekana ukwezi wavutseho

Uruhererekane rwa Gacha - IchigoJam

Twifashishije Gucha reka twerekane Ingombajwi Zose!

```
10  A=RND(26)↵
20  ?"DRAW:";CHR$(ASC("A")+A)↵
```

Inyuguti zose ni 26 kuva kuri A kugera kuri Z. Twifashishije "RND" tugiye gukina Gucha!

Reka twerekane byose.

```
30  [A]=[A]+1↵
40  FOR I=0 TO 25↵
50   LC I%6*5,5+I/6*3↵
60   ?CHR$(ASC("A")+I);":";[I]↵
70  NEXT↵
```

Gucha yikoresha kugeza irangiye!

```
5  CLS:CLV↵
35  N=N+1:C=0↵
65   IF [I] C=C+1↵
80  ?:?:?"COLLECT:";C;"/26  ";↵
90  ?N;"00YEN"↵
100  IF C=26 ?"COMPLETE!":END↵
110  GOTO 10↵
```

Ese wabigura angahe?

Reka noneho "A" ireke kuba hose.

```
15  IF A=0 IF RND(10)>0 A=1↵
```

Reka dukore porobabiliti ibe "B" 9/10 niba "A" ariyo igaragaye.

Gerageza gukora ibi:
1. Noneho gerageza inshuro eshatu, hanyuma ugereranye
2. Noneho tuma A yagaragaraga hose ibe "F"
3. Kora ku buryo "Z" itagaragara
4. Noneho reka "Z" igaragare kuri porobability ya 1/2
5. Reka ntihagire isa n'indi