# *Discuss the Importance of Isolation of Virus Spread-Through the Program to Simulate*

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*Abstract:* With the development of science and technology, computer software has an irreplaceable role, it has been applied to modern people's life, work and learning, and so on, and database is the key to the research and development of computer software. The choice of database is closely related to the quality and efficiency of development. During the epidemic, many popular language programs such as Java and python were used on the Internet to simulate the spread of viruses, while this paper started from the research on VFP, which is an outstanding representative of the small and medium-sized database management system, VFP has the function similar to python and PHP [1] , which shows that VFP has not retired from the historical stage, so far in the University of non-computer science courses are still offered and sales of this software-related books, it is interested in computer beginners have a very important reference value.

## 1. Introduction

At this stage, with the accelerated development of computer, the work of all walks of life has been inseparable from the computer, and people's life (online shopping, communication, etc.) has also been inseparable from the computer, and every different computer software has its unique nature and role, even if it seems to have been eliminated, their advantages can not be ignored. Visual FoxPro 9.0 provides functions, speed, ability and flexibility, which you can't see in the common database management system. It is a more characteristic database management system, it will be non-procedural database operation language and procedural high-level language integration, and also provides a variety of visual programming tools, support object-oriented programming methods, do not need other high-level language and development tools, Direct use of Visual FoxPro9.0 database application system development. Therefore, there are still a lot of people and enthusiasts who use VFP to develop practical and concise systems [2] [3].

Education according to the development of the need, computer courses almost has been from primary school to university of any school has opened, it has become like politics, sports, as an essential public curriculum. For the students of vocational colleges and the computer professional students, VFP is learning computer professional introduction person a good leader, therefore at present many university for non-computer majors in open still VFP course, for starters, it feel

complex and want to give up than to see other programming database software has a strong appeal. I believe that everyone knows what to do in the past two years, which also fully demonstrates the reasonable superiority of China's national management. People are also paying close attention. Many small cases have been found using software to simulate the process of virus transmission [4][5]. Therefore, this paper is the design of the rehearsal process of virus transmission based on VFP.

## 2. Analyze the epidemic process

14 days is the longest incubation period for novel Coronavirus. The official data collection began on January 24 and ended at 24:00 on February 7. The summary includes the data of a complete incubation period after the lockdown of Wuhan, providing a panoramic perspective on the epidemic prevention during the first incubation period after the lockdown of Wuhan[6].

Table 1: Data sheet of the epidemic for the first incubation period after the lockdown in Wuhan

| Date | Confirmed cases | | Suspected case | Newly confirmed cases on the same day | | New Suspected Cases on the same day | | Number of close contacts tracked | | Close contacts under medical observation | | Cumulative death toll | | Cumulative number of cured patients | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | the whole nation | Hubei (Province) | | the whole nation | Hubei (Province) | the whole nation | Hubei (Province) | the whole nation | Hubei (Province) | the whole nation | Hubei (Province) | the whole nation | Hubei Province | the whole nation | Hubei (Province) |
| January 20th | 291 | 270 | 54 | 77 | 72 | 27 | —— | 1739 | 1070 | 922 | 331 | 6 | 6 | 25 | 25 |
| 21 January | 440 | 375 | 37 | 149 | 105 | 26 | —— | 2197 | 1181 | 1394 | 426 | 9 | 9 | 28 | 28 |
| 22 January | 571 | 444 | 393 | 131 | 69 | 257 | —— | 5897 | 2556 | 4928 | 1693 | 17 | 17 | 28 | 28 |
| 23 January | 830 | 549 | 1072 | 259 | 105 | 680 | —— | 9507 | 3653 | 8320 | 2776 | 25 | 24 | 34 | 31 |
| 24 January | 1287 | 729 | 1965 | 444 | 180 | 1118 | —— | 15197 | 5682 | 13967 | 4711 | 41 | 39 | 38 | 32 |
| 25 January | 1975 | 1052 | 2684 | 688 | 323 | 1309 | —— | 23431 | 7989 | 21556 | 6904 | 56 | 52 | 49 | 42 |
| 26 January | 2744 | 1423 | 5794 | 769 | 371 | 3806 | —— | 32799 | 10394 | 30453 | 9103 | 80 | 76 | 51 | 44 |
| 27 January | 4515 | 2714 | 6973 | 1771 | 1291 | 2077 | —— | 47833 | 16904 | 44132 | 15559 | 106 | 100 | 60 | 47 |
| 28 January | 5974 | 3554 | 9239 | 1459 | 840 | 3248 | —— | 65537 | 22095 | 59990 | 20366 | 132 | 125 | 103 | 80 |
| 29 January | 7711 | 4586 | 12167 | 1737 | 1032 | 4148 | —— | 88693 | 28780 | 81947 | 26632 | 170 | 162 | 124 | 90 |
| 30 January | 9692 | 5806 | 15238 | 1982 | 1220 | 4812 | —— | 113579 | 35144 | 102427 | 32340 | 213 | 204 | 171 | 116 |
| 31 January | 11791 | 7153 | 17988 | 2102 | 1347 | 5019 | —— | 136987 | 41075 | 118478 | 36838 | 259 | 249 | 243 | 166 |
| 1 February | 14380 | 9074 | 19544 | 2590 | 1921 | 4562 | 2606 | 153844 | 48571 | 137594 | 43121 | 304 | 294 | 328 | 215 |
| 2 February | 17205 | 11177 | 21558 | 2829 | 2103 | 5173 | 3260 | 189583 | 56088 | 152700 | 48171 | 361 | 350 | 475 | 295 |
| 3 February | 20438 | 13522 | 23214 | 3235 | 2345 | 5072 | 3182 | 221015 | 68988 | 171329 | 58544 | 425 | 414 | 632 | 396 |
| 4 February | 24324 | 16678 | 23260 | 3887 | 3156 | 3971 | 1957 | 252154 | 81039 | 185555 | 66764 | 490 | 479 | 892 | 520 |
| 5 February | 28018 | 19665 | 24702 | 3694 | 2987 | 5328 | 3230 | 282813 | 90997 | 186354 | 64127 | 563 | 549 | 1153 | 633 |
| 6 February | 31116 | 22112 | 26359 | 3143 | 2447 | 4882 | 2622 | 314028 | 101599 | 186045 | 64057 | 636 | 618 | 1540 | 817 |
| 7 February | 34546 | 24953 | 27657 | 3399 | 2841 | 4214 | 2073 | 345498 | 114044 | 189660 | 67802 | 722 | 699 | 2050 | 1115 |

## 3. Analyze the data and structure required for the rehearsal

## 3.1. Data required

This demonstration process with 1,000 people as examples, involving personal position: X coordinate (.far [I,1]) and Y coordinate (.far [I,2]), personal health condition (.FAR [I,3]), personal movement direction: X direction (.far [I,4]) and Y direction (.far [I,5]), number of individual moving steps (.far [I,6]), development minutes (.fnd), number of remaining people (.fNR), etc.

## 3.2. Demo window required

A virus transmission demo window (Form1).

## 3.3. Rehearse ideas

Using a random function, the DOTS move at random, dropping a pathogen at first, spreading through contact, becoming infected and then killing it for a while, until finally all the red dots

disappear, as shown in the four graphs.



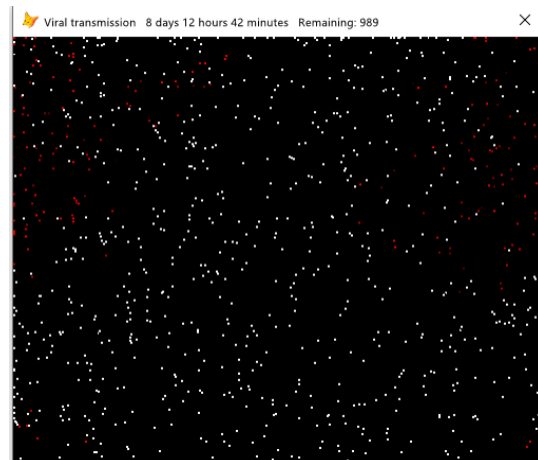Figure 1: 0 Days 4 hours 36 minutes virus transmission remaining condition: 1000



Figure 2: 8 Days 12 hours 42 minutes virus transmission remaining condition: 989



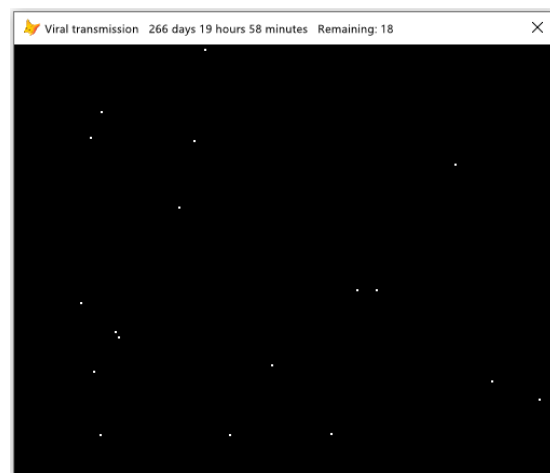Figure 3: 20 Days 23 hours 42 minutes virus transmission remaining condition:71



Figure 4: 266 Days 19 hours 58 minutes virus transmission remaining condition:18

## 4. Rehearse the specific implementation code of the process

```
#define      Number of presenters   1000
……
PUBLIC viral transmission

viral transmission=CREATEOBJECT("Form1")
IF TYPE("viral transmission") = "O"
viral transmission.Show()
ENDIF
DEFINE CLASS Form1 AS form
      ……
    PROCEDURE Activate
          Local lnBC
          Local i
          IF PEMSTATUS(thisform,"faR",5)
```

```
                    RETURN
            ENDIF
            WITH thisform
                    .AddProperty("faR[1]")
                    .AddProperty("fnR",Number of presenters)
                    .AddProperty("fnD",0)
                    DIMENSION thisform.faR[Number of presenters,6]
                    thisform.faR = 0
                    lnBC = thisform.BackColor
                    FOR i=1 to Number of presenters
                            DO WHILE .T.
                                    Individual X coordinates = INT(RAND()*thisform.Width)
                                    Individual Y coordinates = INT(RAND()*thisform.Height)
                                    IF this.Point(Individual X coordinates,Individual Y coordinates)=
lnBC
                                            EXIT
                                    ……
                            Personal health = 0xFFFFFF
                            this.ForeColor = Personal health
                            this.Pset(Individual X coordinates,Individual Y coordinates)
                    ENDFOR
                    i = INT(RAND() * Number of presenters)+1
                    Personal health = 255
            ENDWITH
    ENDPROC
    PROCEDURE Unload
            IF TYPE("viral transmission") = "O" AND (ISNULL(viral transmission) OR viral
transmission == thisform)
            RELEASE viral transmission
            ENDIF
    ENDPROC
    PROCEDURE Timer1.Timer
            this.Enabled = .F.
            Local lnBC,lnP,lnPC
            Local i
            WITH thisform
                    lnBC = thisform.BackColor
                    Development minutes = Development minutes + 23
                    .Caption = "viral transmission " ;
                                    +TRANSFORM(INT(Development minutes/24/60))+"days" ;
                                    +TRANSFORM(MOD(INT(Development minutes/60),24))+
"hours" ;
                                    +PADL(MOD(Development minutes,60),2,"0")+"minutes" ;
                                    +"Remaining:" + TRANSFORM(Number of remaining
personnel)
                    FOR i=1 to Number of presenters
                            IF Personal health = 0
                                    LOOP
```

```
                ENDIF
                The individual steps = The individual steps - 1
                IF Personal X direction=0 and Personal Y direction=0 or The individual
steps <= 0
                        lnP = INT(INT(RAND()*60)*0.15)+1
                        DO CASE
                        CASE lnP=1
                            Personal X direction = - 1
                            Personal Y direction = - 1
                        ……
                        OTHERWISE
                            LOOP
                        ENDCASE
                        The individual steps      = INT(RAND()*50)+5
                ENDIF
                DO CASE
                CASE BETWEEN(Individual X coordinates + Personal X direction, 0,
thisform.Width-1)

                CASE Individual X coordinates + Personal X direction < 0
                    Personal X direction = thisform.Width - 1
                ……
                DO CASE
                CASE BETWEEN(Individual X coordinates + Personal Y direction, 0,
thisform.Height-1)

                ……
                lnPC = .Point(Individual X coordinates + Personal X direction,Individual Y
coordinates + Personal Y direction)
                IF !lnPC = lnBC
                        IF Personal health = 0xFFFFFF
                            IF lnPC <> 0xFFFFFF
                                Personal health = 255
                            ENDIF
                        ……
```

## 5. Conclusion and Prospect

This paper previews the process of virus transmission and preventive measures, and shows a simple simulation process based on VFP. The results show that the simulation process has the advantages of high speed and high precision, and can simulate the epidemic process well.

At the same time, due to the diversity and complexity of the epidemic situation, the method presented in this paper does not simulate the complete epidemic prototype, for example, it can provide more useful information and data (existing suspected cases and close contacts who are still under medical observation) on the effectiveness of epidemic control, the most critical indicators for judging the effectiveness of epidemic control (new cases confirmed on the same day), and judgments on the effectiveness and trend of epidemic prevention and control, etc. , it can not be based on any one of the above indicators, but must take into account all the variables. These need to be further expanded, the future will continue to further study.

## References

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