Advances in Social Science, Education and Humanities Research, volume 428
International Conference on Education, Economics and Information Management (ICEEIM 2019)

Check ID Cards with an Excel Function

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ABSTRACT
This paper introduces the rules for the preparation of CHINA's ID number, and elaborates the method of checking the ID number using functionin in Excel, and elaborates on the function used.
Keywords: *excel, ID number, function*

1. INTRODUCTION

In various forms that contain personnel information, the ID number is a very important data.This article details the use of Excel function to verify the ID number method, has a strong practical value.
The number of China's resident ID card is compiled in accordance with national standards, consisting of 18 digits, in order from left to right in order:6 digits of digital address code,8 The number of digital birth dates, 3-digit sequence codes, and 1-digit check codes. In the id card number preparation rules, the last one is to play the role of verification. The check rule is to take out the first 17 digits of the ID card number, multiply by the corresponding weighting factor and sum s,using S Divide by 11 for the remainder Y,and then get the ID number 18 by comparison check code corresponding table Bits. The verification method is about to calculate the check code and the original ID number of the 18th digit comparison, consistent is through verification, otherwise the ID number is wrong.
Through such preliminary verification can effectively avoid input errors, and even identify some of the forged identity cards. The whole process is complex, with an Excel table instance being implemented step-by-step. Figure 1 is a soldier information sheet containing the ID number, which needs to be checked.

士兵信息

证件号	姓名	性别	身份证号	身份证号校验	出生日期	年龄	籍贯	入伍时间	单位	发证机关	任职时间	职务/军衔
1000001	柏军	女	130629198704040563	TRUE	1987/4/4	28	浙江建德	2007/12/1	96521部队60分队	96521部队司令部	2008.1	司机、一级士官
1000002	吕文武	男	411123198810039615	FALSE	1988/10/3	26	四川成才	2005/12/1	96521部队61分队	96521部队司令部	2006.4	司机、一级士官
1000003	李恒昌	男	320104198208312499	FALSE	1982/8/31	33	山东荷泽	2001/12/1	96521部队78分队	96521部队司令部	2003.3	电话员、一级士官
1000004	韩赤峰	男	350822198705174116	FALSE	1987/5/17	28	浙江安吉	2008/12/1	96521部队83分队	96521部队司令部	2008.5	卫生员、上等兵
1000005	张勇	男	320902198607097033	TRUE	1986/7/9	29	湖北武汉	2006/12/1	96521部队教导队	96521部队司令部	2007.1	司机、上等兵
1000006	王海军	男	320323198604140218	TRUE	1986/4/14	29	广西柳州	2005/12/1	96521部队89分队	96521部队司令部	2007.4	司机、二级士官
1000007	薛州	男	422827198302150733	FALSE	1983/2/15	32	河北唐山	2006/12/1	96521部队64分队	96521部队司令部	2008.3	班长、一级士官
1000008	陈文丽	女	513723198609170047	FALSE	1986/9/17	28	辽宁沈阳	2008/12/1	96521部队83分队	96521部队司令部	2008.5	卫生员、列兵

Figure 1 A sheet need to be checked

2. HOW TO CHECK

2.1. Weighted Sum

The first thing you need to extract is the first 17 digits of your ID number, which can be done with the MID function:
MID(text, start_num, num_chars): Returns characters of a specified length from the starting position specified in the text string.

Numbers extracted from the MID function require weighted sum (the weighted number is shown in Figure 4), and the expression can be written as:
=MID(D3,1,1)*7+MID(D3,2,1)*9+MID(D3,3,1)*10+MID(D3,4,1)*5+MID(D3,5,1)*8+MID(D3,6,1)*4+MID(D3,7,1)*2+MID(D3,8,1)*1+MID(D3,9,1)*6+MID(D3,10,1)*3+MID(D3,11,1)*7+MID(D3,12,1)*9+MID(D3,13,1)*10+MID(D3,14,1)*5+MID(D3,15,1)*8+MID(D3,16,1)*4+MID(D3,17,1)*2
Enter the expression in the "Id number verification" cell, which is E3 cell. The result is shown in Figure 2.

=MID(D3,1,1)*7+MID(D3,2,1)*9+MID(D3,3,1)*10+MID(D3,4,1)*5+MID(D3,5,1)*8+MID(D3,6,1)*4+MID(D3,7,1)*2+MID(D3,8,1)*1+MID(D3,9,1)*6+MID(D3,10,1)*3+MID(D3,11,1)*7+MID(D3,12,1)*9+MID(D3,13,1)*10+MID(D3,14,1)*5+MID(D3,15,1)*8+MID(D3,16,1)*4+MID(D3,17,1)*2

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130629198704040563	284	1987/4/4	28	浙江建德	2007/12/1	96521部队60分队	96521部队司令部	2008.1	司机、一级士官

Figure 2 The result of weighted sum

2.2. Finding the Remainder

Finding the remainder in Excel can be realized by MOD function:

MOD(number, divisor): Returns the remainder of the division of two numbers. The positive and negative sign of the result is the same as the divisor.
The summation result of the first step is nested in the MOD function as a parameter, and the expression is as follows:

=MOD(MID(D3,1,1)*7+MID(D3,2,1)*9+MID(D3,3,1)*10+MID(D3,4,1)*5+MID(D3,5,1)*8+MID(D3,6,1)*4+MID(D3,7,1)*2+MID(D3,8,1)*1+MID(D3,9,1)*6+MID(D3,10,1)*3+MID(D3,11,1)*7+MID(D3,12,1)*9+MID(D3,13,1)*10+MID(D3,14,1)*5+MID(D3,15,1)*8+MID(D3,16,1)*4+MID(D3,17,1)*2,11)

The result is shown in Figure 3.

=MOD(MID(D3,1,1)*7+MID(D3,2,1)*9+MID(D3,3,1)*10+MID(D3,4,1)*5+MID(D3,5,1)*8+MID(D3,6,1)*4+MID(D3,7,1)*2+MID(D3,8,1)*1+MID(D3,9,1)*6+MID(D3,10,1)*3+MID(D3,11,1)*7+MID(D3,12,1)*9+MID(D3,13,1)*10+MID(D3,14,1)*5+MID(D3,15,1)*8+MID(D3,16,1)*4+MID(D3,17,1)*2,11)

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130629198704040563	9	1987/4/4	28	浙江建德	2007/12/1	96521部队60分队	96521部队司令部	2008.1	司机、一级士官

Figure 3 The result of remainder

2.3. Finding the Check Code

After calculating the remainder, we need to query the corresponding check codes, and make the corresponding relationship between the remainder and the check codes into a table and store it in another worksheet. The worksheet is named "Check Data", as shown in Figure 4.

	A	B	C	D	E	F	G
1	身份证位数	加权数		余数	校验码		
2	1	7		0	1		
3	2	9		1	0		
4	3	10		2	X		
5	4	5		3	9		
6	5	8		4	8		
7	6	4		5	7		
8	7	2		6	6		
9	8	1		7	5		
10	9	6		8	4		
11	10	3		9	3		
12	11	7		10	2		
13	12	9					
14	13	10					
15	14	5					
16	15	8					
17	16	4					
18	17	2					

Figure 4 Check data

The function,whitch is named “VLOOKUP”,can be used to find check codes according to the remainder in this worksheet.

VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup]): You can use the VLOOKUP function to search for a cell area (region: two or more cells on a worksheet). Cells in a region can be adjacent or not. The first column then returns the values in any cell on the same row in the region.

According to the rules of function usage, the first parameter in this example can determine the remainder returned by the previous step. The search area is the D2 to E12 regions of the "Check Data" worksheet. The reference method can be expressed as follows:

Check Data!$D$2:$E$12

The third parameter is to find the column where the region target is located. In this case, it is 2. The last parameter logic value means whether to enable Fuzzy Lookup or not. In this case, no need to enable, just fill in “0” or “FALSE”. Therefore, the synthesis expression is:

=VLOOKUP(MOD(MID(D3,1,1)*7+MID(D3,2,1)*9+MID(D3,3,1)*10+MID(D3,4,1)*5+MID(D3,5,1)*8+MID(D3,6,1)*4+MID(D3,7,1)*2+MID(D3,8,1)*1+MID(D3,9,1)*6+MID(D3,10,1)*3+MID(D3,11,1)*7+MID(D3,12,1)*9+MID(D3,13,1)*10+MID(D3,14,1)*5+MID(D3,15,1)*8+MID(D3,16,1)*4+MID(D3,17,1)*2,11), Check Data!$D$2:$E$12,2,0)

The function returns the result as shown in Figure 5.

=VLOOKUP(MOD(MID(D3,1,1)*7+MID(D3,2,1)*9+MID(D3,3,1)*10+MID(D3,4,1)*5+MID(D3,5,1)*8+MID(D3,6,1)*4+MID(D3,7,1)*2+MID(D3,8,1)*1+MID(D3,9,1)*6+MID(D3,10,1)*3+MID(D3,11,1)*7+MID(D3,12,1)*9+MID(D3,13,1)*10+MID(D3,14,1)*5+MID(D3,15,1)*8+MID(D3,16,1)*4+MID(D3,17,1)*2,11),校验数据!$D$2:$E$12,2,0)

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130629198704040563	3	1987/4/4	28	浙江建德	2007/12/1	96521部队60分队	96521部队司令部	2008.1	司机、一级士官

Figure 5 The result of function

2.4. Comparison Verification

The final step requires the check code to be compared with the 18th digit of the ID number to check that it is consistent. The ability to check for consistency can be implemented using the EXACT function:

EXACT(text1, text2): This function is used to compare two strings: TRUE if they are identical; FALSE if not. The function EXACT is case-sensitive, but ignores format differences. The EXACT function can be used to test the text input in the document.

By using the EXACT function to compare the check code and the ID card number at the 18th bit, the expression can be written as follows:

=EXACT(MID(D3,18,1),VLOOKUP(MOD(MID(D3,1,1)*7+MID(D3,2,1)*9+MID(D3,3,1)*10+MID(D3,4,1)*5+MID(D3,5,1)*8+MID(D3,6,1)*4+MID(D3,7,1)*2+MID(D3,8,1)*1+MID(D3,9,1)*6+MID(D3,10,1)*3+MID(D3,11,1)*7+MID(D3,12,1)*9+MID(D3,13,1)*10+MID(D3,14,1)*5+MID(D3,15,1)*8+MID(D3,16,1)*4+MID(D3,17,1)*2,11), Check Data!$D$2:$E$12,2,0))

The result is shown in Figure 6.

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130629198704040563	TRUE	1987/4/4	28	浙江建德	2007/12/1	96521部队60分队	96521部队司令部	2008.1	司机、一級士官
411123198810039615	FALSE	1988/10/3	26	四川威才	2005/12/1	96521部队61分队	96521部队司令部	2006.4	司机、一級士官
320104198208312499	FALSE	1982/8/31	33	山东荷泽	2001/12/1	96521部队78分队	96521部队司令部	2003.3	电话员、一級士官
350822198705174116	FALSE	1987/5/17	28	浙江安吉	2008/12/1	96521部队83分队	96521部队司令部	2008.5	卫生员、上等兵
320902198607097033	TRUE	1986/7/9	29	湖北武汉	2006/12/1	96521部队教导队	96521部队司令部	2007.1	司机、上等兵
320323198604140218	TRUE	1986/4/14	29	广西柳州	2005/12/1	96521部队89分队	96521部队司令部	2007.4	司机、二級士官
422827198302150733	FALSE	1983/2/15	32	河北唐山	2006/12/1	96521部队64分队	96521部队司令部	2008.3	班长、一級士官
513723198609170047	FALSE	1986/9/17	28	辽宁沈阳	2008/12/1	96521部队83分队	96521部队司令部	2008.5	卫生员、列兵

Figure 6 The last result of check

The result shows that the ID number has passed the verification if it is “TRUE”, else the ID number has errors.

3. CONCLUSION

Identity cards are very important to everyone. Whether the authentication is successful or not, the channels of identification card numbers are usually charged, such as bank channels and Ministry of Public Security channels. Before sending validation to these channels, validating them first can improve the success rate of charging validation and save cost. It can also improve the user experience, feedback in time when users input errors without waiting for the return of validation channel results. Relying on Excel software, this paper mainly uses Excel function to realize the verification function. It is easy to operate and difficult to realize. I hope it can inspire everyone's work and study.

REFERENCES

[1] Xiao Yunting, “*Computer Application Foundation*”, Beijing: Machinery Industry Press.

[2] Li Jibing. “*Excel Formula and Function Application Example*”, Beijing: China Youth Publishing House.