

Personalized Birthday Wisher (PBW): An Indispensable SAS® Tool for Your Workplace

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ABSTRACT

Personalized Birthday Wisher (PBW) is a customizable birthday wishing tool which operates on the input provided to it. The input to this tool includes various attributes, based on which a birthday wish comprising of an image and text as its content is selected and delivered via email. This is an automated tool which sends a birthday wish to a team member on his/her birthday based on certain attributes, giving the wish a personalized touch. The attributes chosen for this tool is entirely up to the decision maker making this tool highly customizable. This paper presents an application of the tool with simple predetermined attributes that can be tailored as needed by the team. In addition, the paper also points to various customization possibilities.

INTRODUCTION

Celebrating birthdays is considered a motivating criterion for employees by Human Resource gurus all over the world. This is more effective when wishes are exchanged within a team where members know each other well. The birthday of a team member also serves as an occasion for socializing which indirectly contributes to improved team morale. Even though there are various positives, many organizations do not emphasize its importance resulting in fewer wishes exchanged at the team level, let alone the whole organization. There are many reasons for this practice not being encouraged mainly, the lack of initiative and an appropriate tool to convey the message. PBW is one such tool developed for our team to send birthday wishes. It is customizable and the depth of customization will indicate the personalization of the wish which in turn will dictate the changes required in the code. This paper presents a successful case of conveying a birthday wish at the team level. The various flavors of how this tool could be modified as per the needs of a team are also presented.

DETAILS OF PBW

The details of the PBW are best illustrated with the flow chart presented in Figure 1. This flow chart is self explanatory and the macro presented in the Appendix uses this simplified approach with an additional macro based on gender type. The macro developed for this tool includes various SAS functions/statements such as RANUNI, DOPEN, DNUM, DCLOSE, TODAY, SLEEP, SUBSTR, DO, INPUT, OUTPUT, LIBNAME, FILENAME, OPTIONS etc. in addition to the usage of PROC SQL and DATA steps. The crux of this tool is the usage of FILENAME statement with EMAIL options to convey the wishes via an e-mail. The syntax for this is,

```
FILENAME fileref EMAIL 'address' < e-mail-options >;
```

In the above syntax, 'fileref' is a valid file reference where as 'address' is the e-mail address to which the message needs to be sent. Specifying an address as a FILENAME statement argument is optional. The usage of TO= e-mail option will override an address specification.

TO='to-address': specifies the primary recipient or recipients of the e-mail message.

FROM='from-address': specifies the e-mail address of the author of the message that is being sent. The default value for FROM= is the e-mail address of the user running SAS. Note that you can specify only one e-mail address.

REPLYTO='replyto-address': specifies the e-mail address or addresses for who will receive replies.

BCC='bcc-address': specifies the recipient or recipients that will receive a blind copy of the electronic mail. Individuals listed in the bcc field will receive a copy of the e-mail. The BCC field does not appear in the e-mail header and therefore these e-mail addresses cannot be viewed by other recipients.

CC='cc-address': specifies the recipient or recipients to receive a copy of the e-mail message.

For the TO, FROM, REPLYTO, BCC, CC options, the email address must be within quotation marks. If specifying more than one address, each should be separated by a space with the entire group enclosed within parentheses.

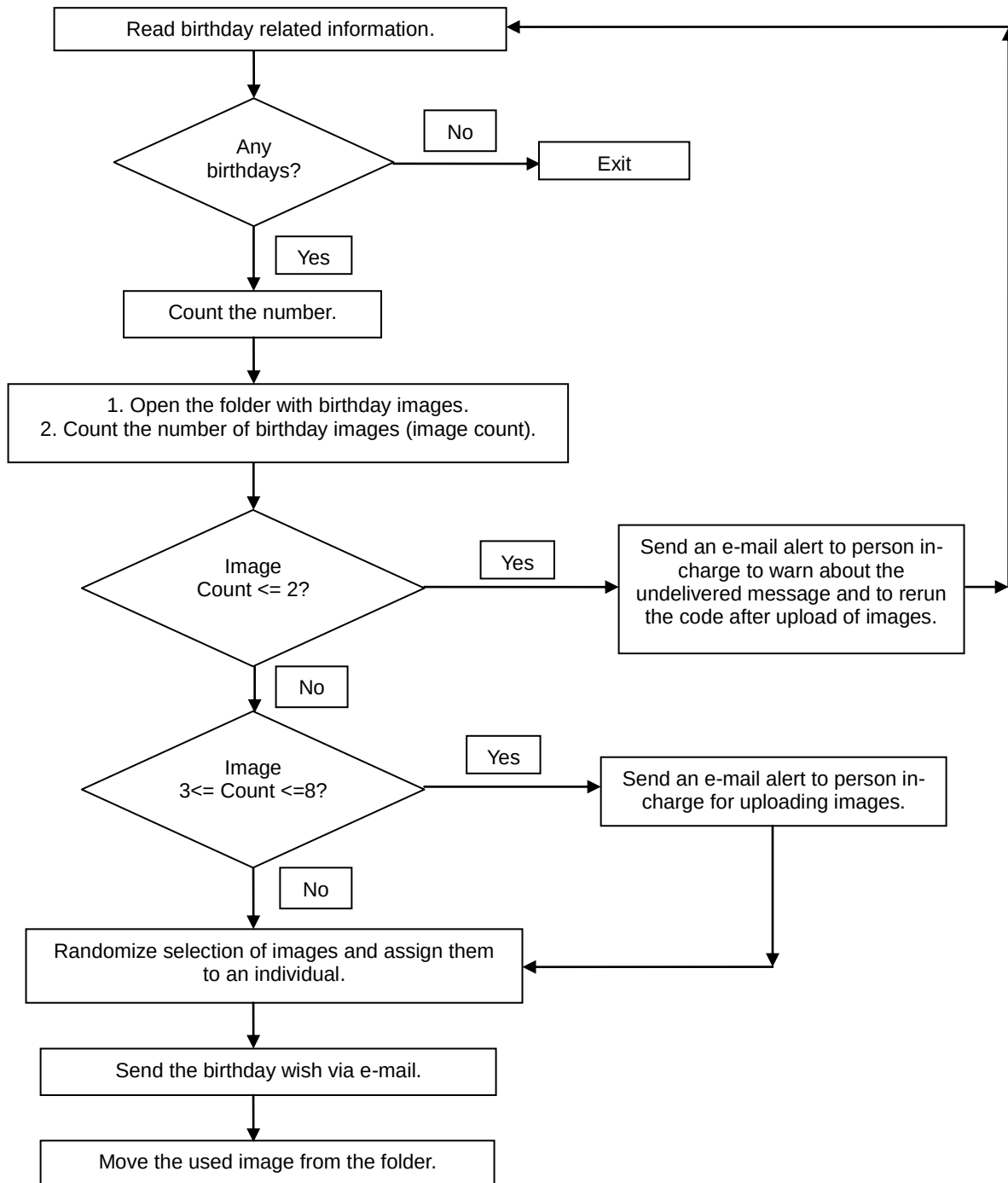


Figure1. PBW's Simplified Flow Chart

SUBJECT=*subject*: specifies the subject of the message. If the subject contains special characters or more than one word (at least one blank space), the text must be enclosed in quotation marks.

ENCODING=*encoding-value*: specifies the text encoding of the attachment that is read into SAS.

CONTENT_TYPE or TYPE or CT=*content/type*: specifies the content type for the attached file. If content type is not specified, SAS tries to determine the correct content type based on the filename.

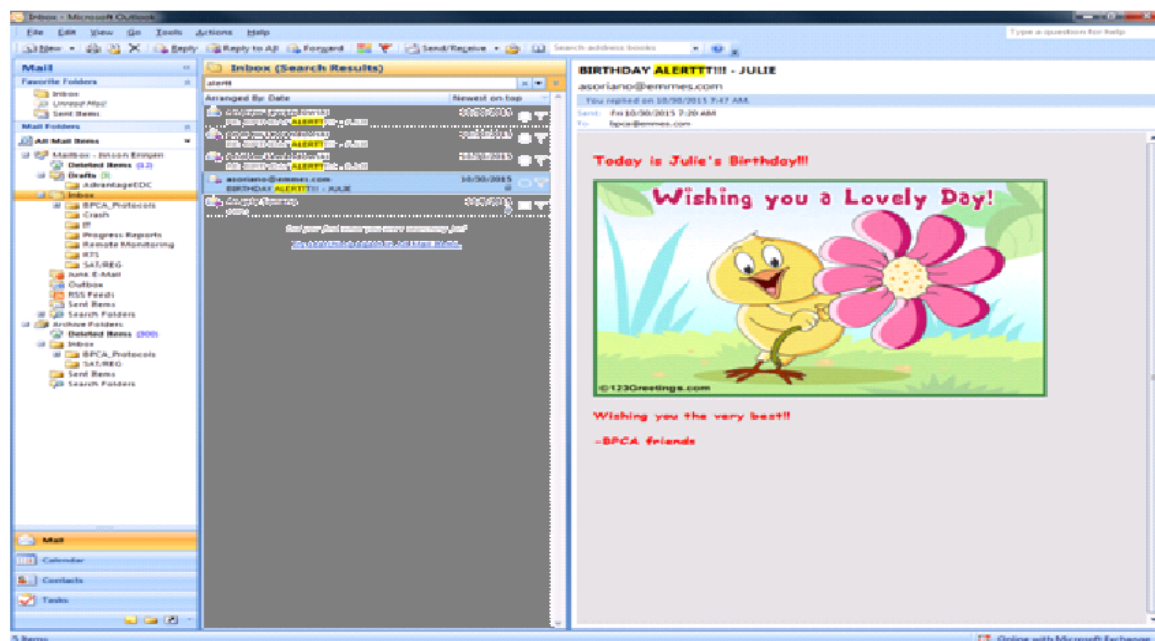
ATTACH='filename.ext' | ATTACH= ('filename.ext' attachment-options): specifies the physical name of the file or files to be attached to the message and any options to modify attachment specifications. The physical name is the name that is recognized by the operating environment. To attach more than one file, enclose the group of files in parentheses with each file enclosed in quotation marks and separated with a space.

The example for using the FILENAME with EMAIL used in developing PBW is presented below.

```
FILENAME myemail EMAIL from="jerinjeri@emmes.com"
      Encoding = 'wlatin2'
      sender   = "jerinjeri@emmes.com"
      replyto  = "jerinjeri@emmes.com"
      to       = ("jerinjeri@emmes.com" "asoriano@emmes.com")
      subject  = "BIRTHDAY ALERTTTT!!!"
      type     = "text/html"
      attach   = "G:\BPCA\jerinjeri\SAS_2016\Male\Male_img1";
```

Also, necessary with email feature are the various options associated with the set up such as EMAILSYS and EMAILHOST. These system options specify which e-mail system to use for sending electronic mail via SAS. For more information on these, refer to the articles in the references.

The ODS HTML TEXT statement within ODS with HTML as destination is used to convey the necessary text as well as image in the email content. Display1 shows a sample output of the birthday wish using these statements.



Display 1. Output of the Birthday Wish

The flow chart describes the randomized selection of images and the SAS code presented in the Appendix uses the RANUNI function to randomize the images. The RANUNI function returns a number that is generated from the uniform distribution on the interval (0,1) and these are then sorted and assigned to individuals. Table 1 shows the allocation of images in the sorted order using the RANUNI function.

Name	i	Randoms
images66HF2KWL.jpg	1	0.18496
imagesEO7PQXAD.jpg	2	0.97009

Table 1. Allocation of Images

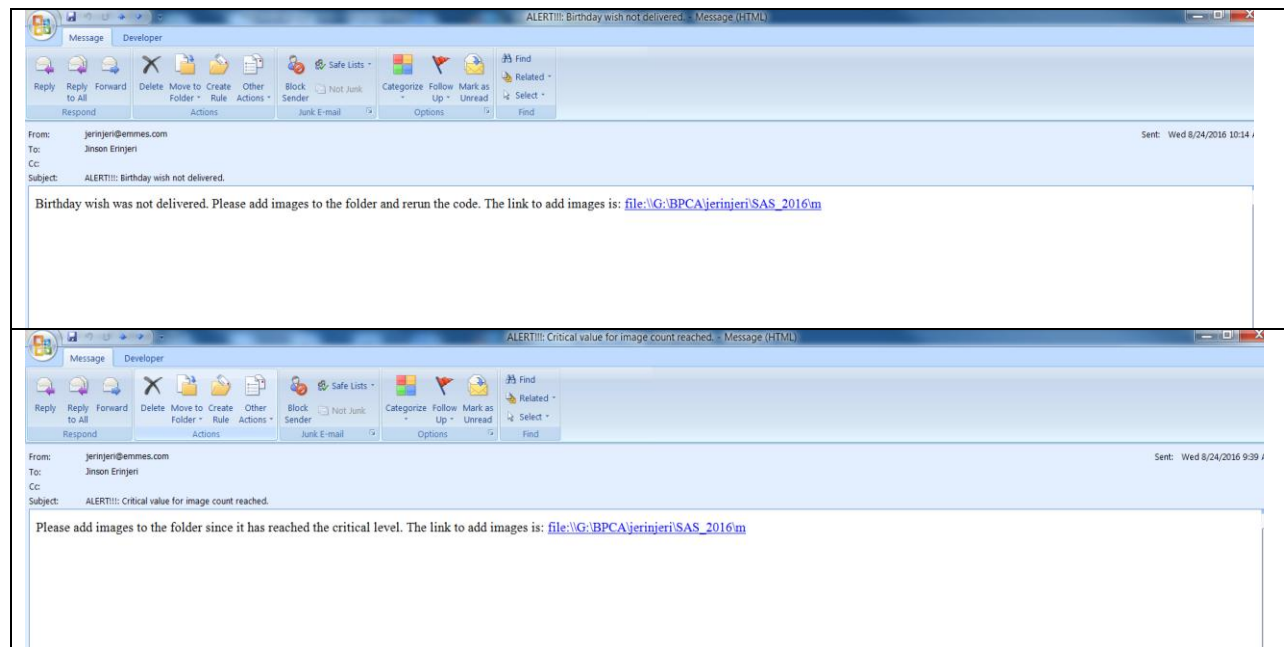
The randomized allocated images are not repeated and hence these are moved on to a different folder or one can also customize the code to delete it. This is done by using X and MOVE commands in SAS.

To read and process files in a directory via SAS, the tool uses data information functions such as DOPEN, DNUM, DREAD, and DCLOSE. Table 2 shows the details of the data information functions used in this tool.

Function Name	Function Purpose	Syntax
DOPEN	Opens a directory and returns a directory identifier value	DOPEN(fileref)
DNUM	Returns the number of members in a directory	DNUM(directory_id)
DREAD	Returns the name of a directory member	DREAD(directory_id, member-number)
DCLOSE	Closes a directory that was opened by the DOPEN function	DCLOSE (directory_id)

Table 2. Data Information Functions

There is a provision in the PBW tool to determine the number of images remaining in the folder so that it can alert the responsible individual to upload images. In this case, the critical value is set to 8. The message is sent via an e-mail and uses the same set up as discussed earlier. The program does not execute the birthday wish when there are less than 2 images in the folder and an alert is sent to the person in-charge stating the delivery failure. Display 2 shows both kinds of alerts.



Display 2. Alert for Delivery Failure and Image Uploads

The complete code for PBW is presented in the Appendix of this paper with additional output of birthday wishes.

CONCLUSION

The paper presents a tool to send personalized birthday wish using SAS. The presented case of PBW in this paper uses the randomized approach of selecting images within gender when sending a birthday wish. There can be various changes made in the presented case to cater to the requirement of a team such as:

1. The differentiation of gender can be relaxed.
2. The randomization approach can be removed to follow the sequential order of images in the folder.
3. There can be additional categories added such as age groups within gender and so forth.
4. The randomized approach can be replaced with a one-on-one approach where an image is selected based on an individual, which in fact will reflect the most personalized wish.

REFERENCES

SAS Online Documents. Available at

<http://support.sas.com/documentation/cdl/en/lrdict/64316/HTML/default/viewer.htm#a002058232.htm>

Cochran, Ben. 2012. "Reading and Processing the Contents of a Directory", *Proceedings of 2012 Midwest SAS Users Group (MWSUG) Conference*. Minneapolis, MN. Available at <http://www.mwsug.org/proceedings/2012/S1/MWSUG-2012-S128.pdf>

SAS Online Documents, Samples and SAS Notes. Available at <http://support.sas.com/kb/37/864.html>

CONTACT INFORMATION

Your comments/questions/criticisms are valued and encouraged. Please contact the authors at:

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APPENDIX

PBW Code

```
options center orientation=portrait ps=68 ls=120 noxwait noxsync;
options emailsys=smtplib emailhost=smtplib.emmes.com;

/*Folders with birthday images-----*/
filename f_fold 'G:\BPCA\jerinjeri\SAS_2016\F';
filename m_fold 'G:\BPCA\jerinjeri\SAS_2016\M';

/*Reading team members birthday information from .xls file-----*/
data _null_;
  x 'copy "G:\BPCA\COMMON\Staff Contacts-Schedules.xls"
    "G:\BPCA\jerinjeri\SAS_2016\Staff Contacts-Schedules.xls"';
  wait_sec=sleep(5);
run;

libname xlret "G:\BPCA\jerinjeri\SAS_2016\Staff Contacts-Schedules.xls";
data staff;
  set xlret.'Internal Reference Only$'n;
  where birthday ne .;
  todays=put(today(),date9.);
run;
```

```

data bday_today;
    set staff;
    bday=substr(put(birthday,date9.),1,5);
    tday=substr(todays,1,5);
    if bday=tday;
run;
proc sql;
    select count(name)
    into :m_cnts
    from bday_today
    where gender='M';
    select name
    into :m_name separated by ' '
    from bday_today
    where gender='M';

    select count(name)
    into :f_cnts
    from bday_today
    where gender='F';
    select name
    into :f_name separated by ' '
    from bday_today
    where gender='F';
quit;
%put &m_cnts. &f_cnts.;%put &m_name. &f_name.;

/*Macro for alerting undelivered message when the image count is equal to 2*/
%macro email_alert1(foldr=);
FILENAME myemail EMAIL from="jerinjeri@emmes.com"
    encoding = 'wlatin2'
    sender    = "jerinjeri@emmes.com"
    replyto   = "jerinjeri@emmes.com"
    to        = "jerinjeri@emmes.com"
    subject   = "ALERT!!!: Birthday wish not delivered."
    type      = "text/html";
data _null_;
    file myemail;
    put "Birthday wish was not delivered.";
    put "Please add images to the folder and rerun the code.";
    put "The link to add images is:
        file:\\G:\\BPCA\\jerinjeri\\SAS_2016\\&foldr.";
run;
%mend;

/*Macro for alerting when the image count reaches the critical level-----*/
%macro email_alert2(foldr=);
FILENAME myemail EMAIL from="jerinjeri@emmes.com"
    Encoding = 'wlatin2'
    sender    = "jerinjeri@emmes.com"
    replyto   = "jerinjeri@emmes.com"
    to        = "jerinjeri@emmes.com"
    subject   = "ALERT!!!: Critical value for image count reached."
    type      = "text/html";
data _null_;
    file myemail;
    put "Please add images to the folder since it has reached the critical
        level.";

```

```

        put "The link to add images is:
            file:\\G:\\BPCA\\jerinjeri\\SAS_2016\\&foldr.";
run;
%mend;

/*Creating SAS data sets of images by opening folders and reading the files*/
%macro read_fold(gender=);
%if &&&gender._cnts. >0 %then %do; /*to check for birthdays*/
    data &gender._name;
        length name $50;
        drop rc did;
        did=dopen("&gender._fold");
        if did > 0 then do;
            do i=1 to dnum(did);
                name=dread(did,i);
                output;
            end;
            rc=dclose(did);
        end;
        else put 'Could not open directory';
        call symput('cnt_img',i);
    run;

/*Alerts based on image counts-----*/
%if &cnt_img.<3 %then %do;
    %email_alert1(foldr=&gender.);
%end;
%else %if &cnt_img.>2 and &cnt_img. <8 %then %do;
    %email_alert2(foldr=&gender.);

/*Random selection of images-----*/
    data &gender._image;
        set &gender._name;
        randoms=ranuni(i);
    run;
    proc sort data=&gender._image;
        by randoms;
    run;

    data &gender._sel_image;
        set &gender._image(obs=&&&gender._cnts.);
    run;
    proc sql;
        select name
            into :&gender._img separated by '*'
            from &gender._sel_image;
    quit;

/*E-mails for birthday wishes-----*/
%do i=1 %to &&&gender._cnts.;
%let &gender._name&i.=%scan(&&&gender._name.,&i.);
%let &gender._img&i.=%qscan(&&&gender._img.,&i.,*); /*important*/
    FILENAME myemail EMAIL from="jerinjeri@emmes.com"
        encoding='wlatin2'
        sender = "jerinjeri@emmes.com"
        replyto = "jerinjeri@emmes.com"
        to = "jerinjeri@emmes.com"

```

```

subject = "BIRTHDAY ALERTTTT!!! - %UPCASE(&&&gender._name&i.)"
type     = "text/html"
attach   = "G:\BPCA\jerinjeri\SAS_2016\&gender.\&&&gender._img&i..";

ods listing close;
title;
ods html body=myemail options(pagebreak="no") style=myHTML rs=none;

/*ODS to HTML with rs=none option forces ODS to perform record based output*/
data _null_;
ods html text = "<br><div align=left> <font size=4 FACE='Comic Sans
MS' color=red><b> Today is &&&gender._name&i.'s
Birthday!!! </b></font> </div>";

ods html text = "<br><img src = &&&gender._img&i..></img></b>";
ods html text = "<br><div align=left> <font size=3 FACE='Comic Sans
MS' color=red><b> Wishing you the very best!!
</b></font> </div>";

ods html text = "<br><div align=left> <font size=3 FACE='Comic Sans
MS' color=red><b> -BPCA friends </b></font> </div>";

run;
ods _all_ close;

/*Removing/transferring the used images from the folder-----*/
x "move G:\BPCA\jerinjeri\SAS_2016\&gender.\&&&gender._img&i..
G:\BPCA\jerinjeri\SAS_2016\&gender._used";
%end;
%end;

%end;
%mend;

%read_fold(gender=m);
%read_fold(gender=f);

```

Sample Output of Birthday Wishes

