Relax Take Home Challenge Findings

The Relax Take Home Challenge was meant to determine what factors predict future user adoption, identified as a user who has logged into the product on three separate days in one seven-day period. The first thing that was calculated was to see which users were considered 'Adopted Users'. I created a function to iterate over all the users that checked user login dates to determine their 'Adopted User' status and the results of run of the function returned a value to the 'adopted_user' column.

```python
def three_day(df_user_id):
    '''
    Calculates if there was 3 log ins in a 7 day period.

    Uses a for loop to iterate through a list of log in dates sorted by the date. The currently selected date is subtracted
    from the date that is 2 dates later. If the difference is less than 7 days, then return 1 for a adopted user, otherwise
    return 0 for a not adopted user.

    For example:
                time_stamp      user_id    visited    year
        2013-02-19 09:15:48     3638        1        2013-02-19
        2013-02-20 09:15:48     3638        1        2013-02-20
        2013-02-25 09:15:48     3638        1        2013-02-25

    the first time stamp is subtracted from the timestamp 2 ahead (2013-02-25 minus 2013-02-19 == 6 days),
    therefore returns 1
    '''
    df_slice = takehome_engagement[takehome_engagement['user_id']==df_user_id]
    count = 0
    date_list = list(df_slice['year'])
    for x in range(len(date_list)):
        if x+2<len(date_list): # Checks to make sure that there are at least 3 days in the list of dates
            if date_list[x+2]-date_list[x] <= datetime.timedelta(days=7):
                return 1
    return 0
```

From the analysis of the log in and engagement data, we have determined that the most important feature when determining 'adoptive user' status is the **'last_session_creation_time'** feature. I also saw some correlation between 'GUEST INVITE' and 'PERSONAL PROJECTS' creation source users and classification as an 'adoptive user'. I checked to see if there were any trends with the hour of logins for adoptive users, but did not see any trends.

Further research can be done on types of devices used to login, the location of the user, and the language spoken by the user.