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''' This script was use to perform the analysis on the MapTheSeas survey and create the plots
    used in Shannon Hoy's Thesis.  Created in March 2018.'''

#Import Necessary Packages
import pandas as pd
import seaborn as sbn
from matplotlib import pyplot as plt

# Import Processed Dataset
file = '/home/mapper/SurveyMonkey/MapTheSeas/EditedData/ProcessedResponses.csv'

# Set up Pandas Dataframe
df = pd.read_csv(file)
total = float(len(df))


# Set Style for figures
def set_style():
    import seaborn as sbn

    # This sets reasonable defaults for font size for
    # a figure that will go in a paper
    sbn.set_context("paper")

    # Set the font to be serif, rather than sans
    sbn.set(font='serif')

    # Make the background white, and specify the
    # specific font family
    sbn.set_style("whitegrid", {
        "font.family": "serif",
        "font.serif": ["Times", "Palatino", "serif"]})


# Question 2: Response Demographic
# Set up figure
set_style()
# Subplots for 3 demographic questions
f, (ax1, ax2, ax3) = plt.subplots(ncols=3, sharey=True)
f.suptitle('Response Demographics', fontweight='bold')
f.set_size_inches(8, 5)
# sbn.set_palette('GnBu_d')
# USA or International Subplot
Question2A = sbn.countplot(x="U.S.A. or International", data=df, ax=ax1)
for p in Question2A.patches:
    height = p.get_height()
    Question2A.text(p.get_x()+p.get_width()/2., height + 3, '{:1.0f}'.format(height),
                    ha="center")
Question2A.xaxis.set_label_text("U.S. or International", fontweight='bold')
Question2A.yaxis.set_label_text("counts", fontweight='bold')
# East or West Coast Subplot
Question2B = sbn.countplot(x="U.S. East or West Coast", data=df, ax=ax2)
for p in Question2B.patches:
    height = p.get_height()
    Question2B.text(p.get_x()+p.get_width()/2., height + 3, '{:1.0f}'.format(height),
                    ha="center")
Question2B.xaxis.set_label_text("U.S. Location", fontweight='bold')
Question2B.yaxis.set_label_text("counts", fontweight='bold')
# Lake or Sea Subplot
Question2C = sbn.countplot(x="Lake or Sea", data=df, ax=ax3)
for p in Question2C.patches:
    height = p.get_height()
    Question2C.text(p.get_x()+p.get_width()/2., height + 3, '{:1.0f}'.format(height),
                    ha="center")
Question2C.xaxis.set_label_text("Lake or Sea", fontweight='bold')
Question2C.yaxis.set_label_text("counts", fontweight='bold')
# Export Figure
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filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question2.png'
f.savefig(filename, dpi=300, format='png')


# Question 3: How long do you typically go out for
f, ax1 = plt.subplots(ncols=1)
f.suptitle('Typical Duration of Trip', fontweight='bold')
f.set size inches(7, 5)
sbn.set palette('GnBu d')
Question3 = sbn.countplot(x="Question 3", data=df, order=['A few hours',
                                                          'Overnight trips',
                                                          'An entire day',
                                                           'All of the above'])
Question3.xaxis.set label text(" ", fontweight='bold')
Question3.yaxis.set label text("counts", fontweight='bold')
for p in Question3.patches:
    height = p.get height()
    Question3.text(p.get x()+p.get width()/2., height + 1, '{:1.0f}'.format(height),
                   ha="center")
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question3.png'
f.savefig(filename, dpi=300, format='png')


# Question 3: Subplots
f, (ax1, ax2, ax3) = plt.subplots(nrows=3)
f.suptitle('Typical Duration of Trip', fontweight='bold')
f.set size inches(7, 10)
sbn.set palette('deep', 2)
# U.S.A. vs International
Question3A = sbn.countplot(x="Question 3", ax=ax1, data=df, hue='U.S.A. or International',
                           order=['A few hours', 'An entire day', 'Overnight trips',
                                                           'All of the above'])
Question3A.xaxis.set label text(" ", fontweight='bold')
Question3A.yaxis.set label text("counts", fontweight='bold')
Question3A.legend(loc='upper right', title='U.S. or International')
for p in Question3A.patches:
    x = p.get bbox().get points()[:, 0]
    y = p.get bbox().get points()[1, 1]
    Question3A.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# East vs. West
sbn.set palette('deep', 3)
Question3B = sbn.countplot(x="Question 3", ax=ax2, data=df, hue='U.S. East or West Coast',
                             order=['A few hours', 'An entire day', 'Overnight trips',
                                    'All of the above'])
Question3B.xaxis.set label text(" ", fontweight='bold')
Question3B.yaxis.set label text("counts", fontweight='bold')
for p in Question3B.patches:
    x = p.get bbox().get points()[:, 0]
    y = p.get bbox().get points()[1, 1]
    Question3B.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
Question3B.legend(loc='upper right', title='U.S. Location')
# Sea vs. Lake
sbn.set palette('deep', 2)
Question3C = sbn.countplot(x="Question 3", ax=ax3, data=df, hue='Lake or Sea',
                           order=['A few hours', 'An entire day', 'Overnight trips',
                                                           'All of the above'])
Question3C.xaxis.set label text(" ", fontweight='bold')
Question3C.yaxis.set label text("counts", fontweight='bold')
Question3C.legend(loc='upper right', title='Sea or Lake')
for p in Question3C.patches:
    x = p.get_bbox().get_points()[:, 0]
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    y = p.get_bbox().get_points()[1, 1]
    Question3C.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question3 subplots.png'
f.savefig(filename, dpi=300, format='png')


# Question 4: Do you go out year round?
f=plt.figure()
f.suptitle('Do you go out year round?', fontweight='bold')
set style()
f.set size inches(7, 5)
sbn.set palette('GnBu d')
Question4 = sbn.countplot(x="Question 4", data=df)
Question4.xaxis.set label text(" ", fontweight='bold')
Question4.yaxis.set label text("counts", fontweight='bold')
for p in Question4.patches:
    x = p.get_bbox().get_points()[:, 0]
    y = p.get_bbox().get_points()[1, 1]
    Question4.annotate('{:1.0f}'.format(y),(x.mean(),y),
            ha='center', va='bottom')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question4.png'
f.savefig(filename, dpi=300, format='png')


# Month's Active
filename = '/home/mapper/SurveyMonkey/MapTheSeas/EditedData/ActiveMonths.csv'
months = pd.read csv(filename)
sbn.set palette('inferno', 12)
set style()
list(months)
x = ['Jan', 'Feb', 'Mar', 'Apr', 'May','Jun', 'Jul', 'Aug', 'Sep', 'Oct', 'Nov', 'Dec']
y = [(months['Jan'] == 'Y').sum(), (months['Feb'] == 'Y').sum(),
     (months['Mar'] == 'Y').sum(), (months['Apr'] == 'Y').sum(),
     (months['May'] == 'Y').sum(), (months['Jun'] == 'Y').sum(),
     (months['Jul'] == 'Y').sum(), (months['Aug'] == 'Y').sum(),
     (months['Sep'] == 'Y').sum(), (months['Oct'] == 'Y').sum(),
     (months['Nov'] == 'Y').sum(), (months['Dec'] == 'Y').sum()]
fig = plt.figure()
fig.set size inches(8, 5)
ax = plt.axes()
monthplt = sbn.barplot(x=x, y=y, color='0.35')
for p in monthplt.patches:
    x = p.get_bbox().get_points()[:, 0]
    y = p.get_bbox().get_points()[1, 1]
    monthplt.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
ax.set title('Months Active', fontsize=16, fontweight='bold')
ax.set xlabel('Month', fontweight='bold')
ax.set ylabel('counts', fontweight='bold')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/MonthsActive.png'
f.savefig(filename, dpi=300, format='png')



# Question 5: Do you have depth sounding equipment?
f = plt.figure()
f.suptitle('Do you have depth sounding equipment?', fontweight='bold')
f.set size inches(7, 5)
sbn.set palette('GnBu d')
Question5 = sbn.countplot(x="Question 5", data=df)
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Question5.yaxis.set_label_text("counts", fontweight='bold')
Question5.xaxis.set_label_text(" ", fontweight='bold')
for p in Question5.patches:
    x = p.get_bbox().get_points()[:, 0]
    y = p.get_bbox().get_points()[1, 1]
    Question5.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question5.png'
f.savefig(filename, dpi=300, format='png')



# Question 5: Type of Sonar
f = plt.figure()
f.suptitle('Make of Depth Sounder', fontweight='bold')
f.set_size_inches(7, 5)
sbn.set_palette('GnBu_d')
Question5A = sbn.countplot(y="Question 5 Add", data=df, color='0.35',
                           order=df['Question 5 Add'].value_counts().index)
Question5A.yaxis.set_label_text(" ", fontweight='bold')
Question5A.xaxis.set_label_text("counts", fontweight='bold')
for p in Question5A.patches:
    x = p.get_bbox().get_points()[1, 0]
    y = p.get_bbox().get_points()[:, 1]
    Question5A.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question5A.png'
f.savefig(filename, dpi=300, format='png')



# Question 5: Type of Sonar by Lake or Sea
f = plt.figure()
f.suptitle('Make of Depth Sounder', fontweight='bold')
f.set_size_inches(8, 6)
sbn.set_palette('deep', 2)
Question5B = sbn.countplot(y="Question 5 Add", data=df,
                           order=df['Question 5 Add'].value_counts().index,
                           hue='Lake or Sea')
Question5B.yaxis.set_label_text(" ", fontweight='bold')
Question5B.xaxis.set_label_text("counts", fontweight='bold')
Question5B.legend(loc='lower right', title='Sea or Lake')
for p in Question5B.patches:
    x = p.get_bbox().get_points()[1, 0]
    y = p.get_bbox().get_points()[:, 1]
    Question5B.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question5B.png'
f.savefig(filename, dpi=300, format='png')



# Question 5: Type of Sonar by U.S. or International
f = plt.figure()
f.suptitle('Make of Depth Sounder', fontweight='bold')
f.set_size_inches(8, 6)
sbn.set_palette('deep', 2)
Question5C = sbn.countplot(y="Question 5 Add", data=df,
                           order=df['Question 5 Add'].value_counts().index,
                           hue='U.S.A. or International')
Question5C.yaxis.set_label_text(" ", fontweight='bold')
Question5C.xaxis.set_label_text("counts", fontweight='bold')
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Question5C.legend(loc='lower right', title='U.S. or International')
for p in Question5C.patches:
    x = p.get_bbox().get_points()[1, 0]
    y = p.get_bbox().get_points()[:, 1]
    Question5C.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question5C.png'
f.savefig(filename, dpi=300, format='png')



# Question 5: Type of Sonar by U.S. or International
f = plt.figure()
f.suptitle('Make of Depth Sounder', fontweight='bold')
f.set_size_inches(8, 6)
sbn.set_palette('deep', 3)
Question5D = sbn.countplot(y="Question 5 Add", data=df,
                           order=df['Question 5 Add'].value_counts().index,
                           hue='U.S. East or West Coast')
Question5D.yaxis.set_label_text(" ", fontweight='bold')
Question5D.xaxis.set_label_text("counts", fontweight='bold')
Question5D.legend(loc='lower right', title='U.S. Location')
for p in Question5D.patches:
    x = p.get_bbox().get_points()[1, 0]
    y = p.get_bbox().get_points()[:, 1]
    Question5D.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question5D.png'
f.savefig(filename, dpi=300, format='png')



# Question 6: Do you have a GPS on your vessel?
f = plt.figure()
f.suptitle('Do you have a GPS on your vessel?', fontweight='bold')
f.set_size_inches(7, 5)
sbn.set_palette('GnBu_d')
Question6 = sbn.countplot(x="Question 6", data=df)
Question6.yaxis.set_label_text("counts", fontweight='bold')
Question6.xaxis.set_label_text(" ", fontweight='bold')
for p in Question6.patches:
    x = p.get_bbox().get_points()[:, 0]
    y = p.get_bbox().get_points()[1, 1]
    Question6.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question6.png'
f.savefig(filename, dpi=300, format='png')



# Make of GPS Equipment
df2 = df[['Question 6P', 'Question 6P2', 'Question 6P3']].copy()
Counts = df2.apply(pd.Series.value_counts)
Counts['Sum'] = Counts.sum(axis=1)
f = plt.figure()
f.suptitle('Make of GPS', fontweight='bold')
f.set_size_inches(7, 5)
Question6A = sbn.barplot(x=list(Counts['Sum']), y=list(Counts.index), data=Counts,
                         color='0.35',
                         order=['Garmin', 'Raymarine', 'Furuno', 'Lowrance',
                         'B & G', 'Simrad', 'Standard Horizon', 'Hummingbird',
                         'Airmar', 'Bad Elf', 'Digital Yacht', 'Navman', 'Si-Tex'])
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Question6A.yaxis.set_label_text(" ", fontweight='bold')
Question6A.xaxis.set_label_text("counts", fontweight='bold')
for p in Question6A.patches:
    x = p.get_bbox().get_points()[1, 0]
    y = p.get_bbox().get_points()[:, 1]
    Question6A.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question6A.png'
f.savefig(filename, dpi=300, format='png')



# Question 7: Do you have an AIS unit?
f = plt.figure()
f.suptitle('Do you have an AIS?', fontweight='bold')
f.set_size_inches(7, 5)
sbn.set_palette('GnBu_d')
Question7 = sbn.countplot(x="Question 7", data=df)
Question7.yaxis.set_label_text("counts", fontweight='bold')
Question7.xaxis.set_label_text(" ", fontweight='bold')
for p in Question7.patches:
    x = p.get_bbox().get_points()[:, 0]
    y = p.get_bbox().get_points()[1, 1]
    Question7.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question7.png'
f.savefig(filename, dpi=300, format='png')



# Question 8: What do you use for navigation?
f = plt.figure()
f.suptitle('What do you use for navigation?', fontweight='bold')
f.set_size_inches(8, 5)
sbn.set_palette('GnBu_d')
y = [int(df['Question 8S1'].value_counts()), int(df['Question 8S2'].value_counts()),
     int(df['Question 8S3'].value_counts()), int(df['Question 8S4'].value_counts()),
     int(df['Question 8S5'].value_counts())]
x = [df['Question 8S1'].value_counts().index.tolist()[0],
     df['Question 8S2'].value_counts().index.tolist()[0],
     df['Question 8S3'].value_counts().index.tolist()[0],
     df['Question 8S4'].value_counts().index.tolist()[0],
     df['Question 8S5'].value_counts().index.tolist()[0]]
Question8 = sbn.barplot(x=y, y=x, data=df, order=['GPS Chart Plotter',
                                                  'Phone or Tablet Application',
                                                  'Paper Charts',
                                                  'Navigational Software on Laptop',
                                                  'None of the Above'])
Question8.xaxis.set_label_text("counts", fontweight='bold')
Question8.yaxis.set_label_text(" ", fontweight='bold')
for p in Question8.patches:
    x = p.get_bbox().get_points()[1, 0]
    y = p.get_bbox().get_points()[:, 1]
    Question8.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question8.png'
f.savefig(filename, dpi=300, format='png')



# Navigation Software
df2 = df[['Question 8P1', 'Question 8P2', 'Question 8P3']].copy()
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Counts = df2.apply(pd.Series.value_counts)
Counts['Sum'] = Counts.sum(axis=1)
f = plt.figure()
f.suptitle('Navigational Software', fontweight='bold')
f.set_size_inches(7, 5)
Question8A = sbn.barplot(x=list(Counts['Sum']), y=list(Counts.index), data=Counts,
                         color='0.35',
                         order=['Navionics', 'Garmin BlueChart', 'OpenCPN', 'C-MAP',
                         'iNavX', 'MX Mariner', 'Nobeltec', 'Coastal Explorer',
                         'Free Charts', 'Google Maps', 'iSailGPS', 'Marine Navigator',
                        'Nautic Insight', 'Skipper', 'TRANSAS ECDIS'])
Question8A.yaxis.set_label_text(" ", fontweight='bold')
Question8A.xaxis.set_label_text("counts", fontweight='bold')
for p in Question8A.patches:
    x = p.get_bbox().get_points()[1, 0]
    y = p.get_bbox().get_points()[:, 1]
    Question8A.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question8A.png'
f.savefig(filename, dpi=300, format='png')



# Question 9: Do you pay for your navigation service?
f = plt.figure()
f.suptitle('Do you pay for your navigation service?', fontweight='bold')
f.set_size_inches(7, 5)
sbn.set_palette('GnBu_d')
Question9 = sbn.countplot(x="Question 9", data=df)
Question9.yaxis.set_label_text("counts", fontweight='bold')
Question9.xaxis.set_label_text(" ", fontweight='bold')
for p in Question9.patches:
    x = p.get_bbox().get_points()[:, 0]
    y = p.get_bbox().get_points()[1, 1]
    Question9.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question9.png'
f.savefig(filename, dpi=300, format='png')



# Question 9A: How much?
f = plt.figure()
f.suptitle('How much do you pay for your navigation service?', fontweight='bold')
f.set_size_inches(7, 5)
set_style()
sbn.set_palette('deep', 2)
Question9A = sbn.countplot(x="Question 9P2", data=df, hue="Question 9P1",
                           order=['0 - 25', '25 - 50', '50 - 100', '100 - 200',
                                  '200 - 300'])
Question9A.xaxis.set_label_text("Dollars", fontweight='bold')
Question9A.yaxis.set_label_text("counts", fontweight='bold')
for p in Question9A.patches:
    x = p.get_bbox().get_points()[:, 0]
    y = p.get_bbox().get_points()[1, 1]
    Question9A.annotate('{:1.0f}'.format(y),(x.mean(),y),
            ha='center', va='bottom')
Question9A.legend(loc='upper right', title='')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question9A.png'
f.savefig(filename, dpi=300, format='png')


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456 # Question 10: Do you always have a smartphone on the boat with you?
457 f = plt.figure()
458 f.suptitle('Do you always have a smartphone on the boat with you?', fontweight='bold')
459 f.set size inches(7, 5)
460 set style()
461 sbn.set palette('GnBu d')
462 Question10 = sbn.countplot(x="Question 10", data=df, order=['Yes', 'No', 'Does not own '
463                                                             'smart device'])
464 Question10.yaxis.set label text("counts", fontweight='bold')
465 Question10.xaxis.set label text(" ", fontweight='bold')
466 for p in Question10.patches:
467     x = p.get bbox().get points()[:, 0]
468     y = p.get bbox().get points()[1, 1]
469     Question10.annotate('{:1.0f}'.format(y), (x.mean(), y),
470             ha='center', va='bottom')
471 # Export Figure
472 filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question10.png'
473 f.savefig(filename, dpi=300, format='png')
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476
477 # Question 11: Would you be willing to share location information
478 # from your phone/tablet or other navigation system?
479 f = plt.figure()
480 f.suptitle('Would you be willing to share location information \n from your '
481            'phone/tablet or other navigation system?', fontweight='bold')
482 f.set size inches(7, 5)
483 set style()
484 sbn.set palette('GnBu d')
485 Question11 = sbn.countplot(x="Question 11", data=df)
486 Question11.yaxis.set label text("counts", fontweight='bold')
487 Question11.xaxis.set label text(" ", fontweight='bold')
488 for p in Question11.patches:
489     x = p.get bbox().get points()[:, 0]
490     y = p.get bbox().get points()[1, 1]
491     Question11.annotate('{:1.0f}'.format(y), (x.mean(), y),
492             ha='center', va='bottom')
493 # Export Figure
494 filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question11.png'
495 f.savefig(filename, dpi=300, format='png')
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498
499 #Question 12: What acquisition method would you prefer?
500 f = plt.figure()
501 f.suptitle('What acquisition method would you prefer?', fontweight='bold')
502 f.set size inches(7, 5)
503 set style()
504 sbn.set palette('GnBu d')
505 Question12 = sbn.countplot(y="Question 12", data=df, order=[
506             'Active data collection', 'Passive data collection',
507             'Option to switch'])
508 Question12.yaxis.set label text(" ", fontweight='bold')
509 Question12.xaxis.set label text("counts", fontweight='bold')
510 for p in Question12.patches:
511     x = p.get bbox().get points()[1, 0]
512     y = p.get bbox().get points()[:, 1]
513     Question12.annotate('{:1.0f}'.format(x), (x, y.mean()),
514             ha='left', va='center')
515 # Export Figure
516 filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question12.png'
517 f.savefig(filename, dpi=300, format='png')
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520
521 #Question 13: What method of data delivery would you be most likely to use?
522 f = plt.figure()
523 f.suptitle('What method of data delivery would you be most likely to use?',
    fontweight='bold')
524 f.set size inches(7, 5)
525 set style()
526 sbn.set palette('GnBu d')
527 Question13 = sbn.countplot(x="Question 13", data=df)
528 Question13.xaxis.set label text("  ", fontweight='bold')
529 Question13.yaxis.set label text("counts", fontweight='bold')
530 for p in Question13.patches:
531     x = p.get bbox().get points()[:, 0]
532     y = p.get bbox().get points()[1, 1]
533     Question13.annotate('{:1.0f}'.format(y), (x.mean(), y),
534             ha='center', va='bottom')
535 # Export Figure
536 filename =
    '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question13.png'
537 f.savefig(filename, dpi=300, format='png')
538
539
540
541 #Question 14: Would you be willing to slightly detour to collect
542 #  data if a site of interest showed up along your route?
543 f = plt.figure()
544 f.suptitle('Would you be willing to slightly detour to collect data if a \n site of
    interest'
545            ' showed up along your route?', fontweight='bold')
546 f.set size inches(7, 5)
547 set style()
548 sbn.set palette('GnBu d')
549 Question14 = sbn.countplot(x="Question 14", data=df, order=['Yes', 'No', 'It would
    depend.'])
550 Question14.xaxis.set label text("  ", fontweight='bold')
551 Question14.yaxis.set label text("counts", fontweight='bold')
552 for p in Question14.patches:
553     x = p.get bbox().get points()[:, 0]
554     y = p.get bbox().get points()[1, 1]
555     Question14.annotate('{:1.0f}'.format(y), (x.mean(), y),
556             ha='center', va='bottom')
557 # Export Figure
558 filename =
    '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question14.png'
559 f.savefig(filename, dpi=300, format='png')
560
561
562
563 #Question 15: Would you be willing to go to locations where data is needed,
564 # even if they were out of your way?
565 f = plt.figure()
566 f.suptitle('Would you be willing to go to locations where data is needed, \n'
567            'even if they were out of your way?', fontweight='bold')
568 f.set size inches(7, 5)
569 set style()
570 sbn.set palette('GnBu d')
571 Question15 = sbn.countplot(x="Question 15", data=df, order=['Yes', 'No'])
572 Question15.xaxis.set label text("  ", fontweight='bold')
573 Question15.yaxis.set label text("counts", fontweight='bold')
574 for p in Question15.patches:
575     x = p.get bbox().get points()[:, 0]
576     y = p.get bbox().get points()[1, 1]
577     Question15.annotate('{:1.0f}'.format(y), (x.mean(), y),
578             ha='center', va='bottom')
579 # Export Figure
580 filename =
```

```
'/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question15.png'
f.savefig(filename, dpi=300, format='png')



#Question 16: What is the maximum distance you would be willing to
# travel out of the way to collect data?
f = plt.figure()
f.suptitle('What is the maximum distance you would be willing to \n '
           'travel out of the way to collect data?', fontweight='bold')
f.set size inches(7, 5)
set style()
sbn.set palette('GnBu d')
Question16 = sbn.countplot(x="Question 16", data=df, order=['1 nm', '2 nm', '5 nm',
'More'])
Question16.xaxis.set label text("Nautical Miles ", fontweight='bold')
Question16.yaxis.set label text("counts", fontweight='bold')
for p in Question16.patches:
    x = p.get bbox().get points()[:, 0]
    y = p.get bbox().get points()[1, 1]
    Question16.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# Export Figure
filename =
'/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question16.png'
f.savefig(filename, dpi=300, format='png')



# Question 17: What sort of incentives would motivate you to collect
#  this crowd-sourced data? (select all that apply)
f = plt.figure()
f.suptitle('What sort of incentives would motivate you to collect \n '
           'this crowdsourced data?', fontweight='bold')
f.set size inches(8, 5)
sbn.set palette('GnBu d', 8)
y = [int(df['Question 17S1'].value counts()), int(df['Question 17S2'].value counts()),
     int(df['Question 17S3'].value counts()), int(df['Question 17S4'].value counts()),
     int(df['Question 17S5'].value counts()), int(df['Question 17S6'].value counts()),
     int(df['Question 17S7'].value counts()), int(df['Question 17S8'].value counts())]
x = [df['Question 17S1'].value counts().index.tolist()[0],
     df['Question 17S2'].value counts().index.tolist()[0],
     df['Question 17S3'].value counts().index.tolist()[0],
     df['Question 17S4'].value counts().index.tolist()[0],
     df['Question 17S5'].value counts().index.tolist()[0],
     df['Question 17S6'].value counts().index.tolist()[0],
     df['Question 17S7'].value counts().index.tolist()[0],
     df['Question 17S8'].value counts().index.tolist()[0]]
Question17 = sbn.barplot(x=y, y=x, data=df, order=['Updated Data', 'Increased
Knowledge',
                                                   'Streamlined Navigational App',
                                                   'Social Network',
                                                   'Monetary Reward',
                                                   'Increased Reputation',
                                                   'Gamification',
                                                   'Certificate of Recognition'])
Question17.xaxis.set label text("counts", fontweight='bold')
Question17.yaxis.set label text(" ", fontweight='bold')
for p in Question17.patches:
    x = p.get bbox().get points()[1, 0]
    y = p.get bbox().get points()[:, 1]
    Question17.annotate('{:1.0f}'.format(x), (x, y.mean()),
            ha='left', va='center')
# Export Figure
filename =
'/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question17.png'
f.savefig(filename, dpi=300, format='png')

```

```
644
645
646  #Question 18: Of these listed, which incentive would most interest you? (Insert Number)
647  df2 = df[['Question 18P1', 'Question 18P2']].copy()
648  Counts = df2.apply(pd.Series.value_counts)
649  Counts['Sum'] = Counts.sum(axis=1)
650  y = ['Increased Knowledge', 'Updated Data', 'Streamlined App', 'Social Network',
651       'Increased Reputation',  'Certificate of Recognition', 'Gamification',
652       'Monetary Reward']
653  x = list(Counts['Sum'])
654  f = plt.figure()
655  f.suptitle('Which incentive would most interest you?', fontweight='bold')
656  f.set_size_inches(7, 5)
657  Question18 = sbn.barplot(x=x, y=y, data=Counts,
658                           color='0.35', order=['Updated Data', 'Streamlined App',
659                                                'Increased Knowledge', 'Monetary Reward',
660                                                'Social Network', 'Certificate of       ↵
                                                   Recognition',
661                                                'Gamification', 'Increased              ↵
                                                   Reputation'])                          ↵
                                                                                          ↵

662  Question18.yaxis.set_label_text(" ", fontweight='bold')
663  Question18.xaxis.set_label_text("counts", fontweight='bold')
664  for p in Question18.patches:
665      x = p.get_bbox().get_points()[1, 0]
666      y = p.get_bbox().get_points()[:, 1]
667      Question18.annotate('{:1.0f}'.format(x), (x, y.mean()),
668              ha='left', va='center')
669  # Export Figure
670  filename =                                                                          ↵
     '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question18.png'
671  f.savefig(filename, dpi=300, format='png')
672
673
674
675  # Question 19: Would you be willing to pay a small fee,
676  # if in exchange you received new hardware, local seafloor data,
677  # or the incentive of your choice?
678  f = plt.figure()
679  f.suptitle('Would you be willing to pay a small fee,  if in exchange you \n'
680             'received new hardware, local seafloor data, or the'
681             ' incentive of your choice?', fontweight='bold')
682  f.set_size_inches(7, 5)
683  set_style()
684  sbn.set_palette('GnBu_d')
685  Question19 = sbn.countplot(x="Question 19", data=df, order=['Yes', 'No'])
686  Question19.xaxis.set_label_text("  ", fontweight='bold')
687  Question19.yaxis.set_label_text("counts", fontweight='bold')
688  for p in Question19.patches:
689      x = p.get_bbox().get_points()[:, 0]
690      y = p.get_bbox().get_points()[1, 1]
691      Question19.annotate('{:1.0f}'.format(y), (x.mean(), y),
692              ha='center', va='bottom')
693  # Export Figure
694  filename =                                                                          ↵
     '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question19.png'
695  f.savefig(filename, dpi=300, format='png')
696
697
698
699  # Question 20: Of these, for which would you most likely pay a small fee?
700  # (New Hardware or Updated Data)
701  f = plt.figure()
702  f.suptitle('Question 20: Of these, for which would you most '
703             'likely pay  \n a small fee? (New Hardware or Updated Data)',             ↵
                fontweight='bold')
704  f.set_size_inches(7, 5)
```

```
set style()
sbn.set palette('GnBu d')
Question20 = sbn.countplot(x="Question 20", data=df)
Question20.xaxis.set label text("  ", fontweight='bold')
Question20.yaxis.set label text("counts", fontweight='bold')
for p in Question20.patches:
    x = p.get bbox().get points()[:, 0]
    y = p.get bbox().get points()[1, 1]
    Question20.annotate('{:1.0f}'.format(y), (x.mean(), y),
            ha='center', va='bottom')
# Export Figure
filename = '/home/mapper/SurveyMonkey/MapTheSeas/Products/SurveyResponsesPLTs/Question20.png'
f.savefig(filename, dpi=300, format='png')
```