In [3]:

```
import pandas as pd
import matplotlib.pyplot as plt
import numpy as np

%matplotlib inline
```

In [5]:

```
data = pd.read_csv("desktop/data/diabetes.csv")
```

In [6]:

```
data.shape
```

Out[6]:

```
(768, 9)
```

In [7]:

```
data.head(5)
```

Out[7]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
0	6	148	72	35	0	33.6	0.627	50	1
1	1	85	66	29	0	26.6	0.351	31	0
2	8	183	64	0	0	23.3	0.672	32	1
3	1	89	66	23	94	28.1	0.167	21	0
4	0	137	40	35	168	43.1	2.288	33	1

In [10]:

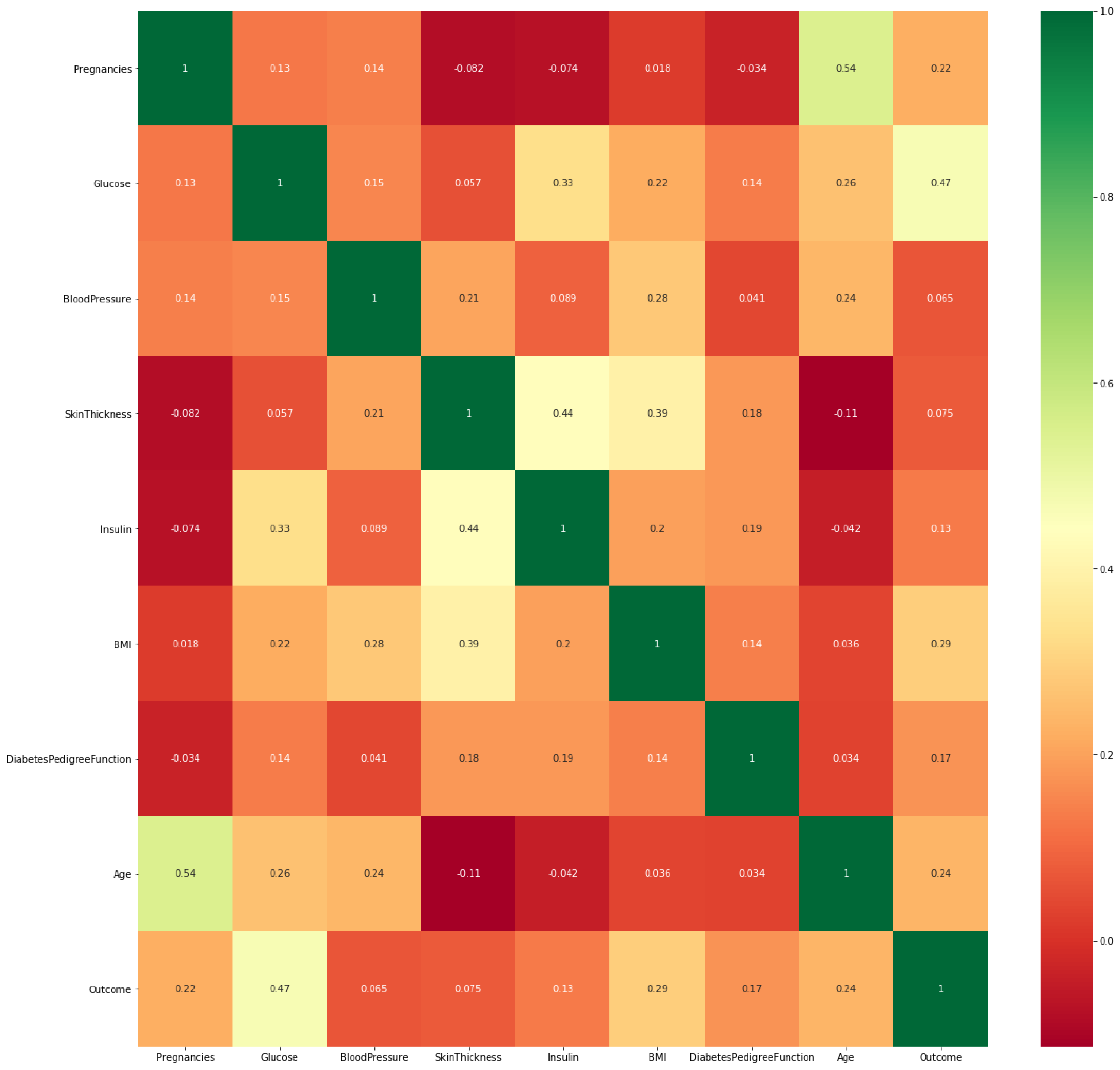
```
# checking if any null value is present
data.isnull().values.any()
```

Out[10]:

```
False
```

In [15]:

```
import seaborn as sns
import matplotlib.pyplot as plt
corrmat = data.corr()
top_corr_features = corrmat.index
plt.figure(figsize=(20,20))
# plotting heatmap
g=sns.heatmap(data[top_corr_features].corr(),annot=True,cmap="RdYlGn")
```



In [16]:

```
data.corr()
```

Out[16]:

	Pregnancies	Glucose	BloodPressure	SkinThickness	Insulin	BMI	DiabetesPedigreeFunction	Age	Outcome
Pregnancies	1.000000	0.129459	0.141282	-0.081672	-0.073535	0.017683	-0.033523	0.544341	0.221898
Glucose	0.129459	1.000000	0.152590	0.057328	0.331357	0.221071	0.137337	0.263514	0.466581
BloodPressure	0.141282	0.152590	1.000000	0.207371	0.088933	0.281805	0.041265	0.239528	0.065068
SkinThickness	-0.081672	0.057328	0.207371	1.000000	0.436783	0.392573	0.183928	-0.113970	0.074752
Insulin	-0.073535	0.331357	0.088933	0.436783	1.000000	0.197859	0.185071	-0.042163	0.130548
BMI	0.017683	0.221071	0.281805	0.392573	0.197859	1.000000	0.140647	0.036242	0.292695
DiabetesPedigreeFunction	-0.033523	0.137337	0.041265	0.183928	0.185071	0.140647	1.000000	0.033561	0.173844
Age	0.544341	0.263514	0.239528	-0.113970	-0.042163	0.036242	0.033561	1.000000	0.238356
Outcome	0.221898	0.466581	0.065068	0.074752	0.130548	0.292695	0.173844	0.238356	1.000000

In [25]:

```
diabetes_true_count = len(data.loc[data['Outcome'] == True])
diabetes_false_count = len(data.loc[data['Outcome'] == False])
```

In [26]:

```
(diabetes_true_count,diabetes_false_count)
```

Out[26]:

```
(268, 500)
```

In [27]:

```
#training test split
from sklearn.model_selection import train_test_split
features_columns = ['Pregnancies','Glucose','BloodPressure','SkinThickness','Insulin','BMI','DiabetesPedigreeFunctio
n','Age']
predicted_class = ['Outcome']
```

In [47]:

```
X = data[features_columns].values
y = data[predicted_class].values


X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.30, random_state=10)
```

In [48]:

```
print("total number of rows : {0}".format(len(data)))
print("number of rows missing Glucose: {0}".format(len(data.loc[data['Glucose'] == 0])))
print("number of rows missing BloodPressure: {0}".format(len(data.loc[data['BloodPressure'] == 0])))
print("number of rows missing SkinThickness: {0}".format(len(data.loc[data['SkinThickness'] == 0])))
print("number of rows missing insulin: {0}".format(len(data.loc[data['Insulin'] == 0])))
print("number of rows missing BMI: {0}".format(len(data.loc[data['BMI'] == 0])))
print("number of rows missing DiabetesPedigreeFunction: {0}".format(len(data.loc[data['DiabetesPedigreeFunction'] ==
0])))
print("number of rows missing Age: {0}".format(len(data.loc[data['Age'] == 0])))
```

```
total number of rows : 768
number of rows missing Glucose: 5
number of rows missing BloodPressure: 35
number of rows missing SkinThickness: 227
number of rows missing insulin: 374
number of rows missing BMI: 11
number of rows missing DiabetesPedigreeFunction: 0
number of rows missing Age: 0
```

In [49]:

```
from sklearn.impute import SimpleImputer
fill_values = SimpleImputer(missing_values=0, strategy="mean")
X_train = fill_values.fit_transform(X_train)
X_test = fill_values.fit_transform(X_test)
```

In [53]:

```
## Apply Algorithm
from sklearn.ensemble import RandomForestClassifier
random_forest_model = RandomForestClassifier(random_state=10)

random_forest_model.fit(X_train, y_train.ravel())
```

Out[53]:

```
RandomForestClassifier(bootstrap=True, ccp_alpha=0.0, class_weight=None,
                       criterion='gini', max_depth=None, max_features='auto',
                       max_leaf_nodes=None, max_samples=None,
                       min_impurity_decrease=0.0, min_impurity_split=None,
                       min_samples_leaf=1, min_samples_split=2,
                       min_weight_fraction_leaf=0.0, n_estimators=100,
                       n_jobs=None, oob_score=False, random_state=10, verbose=0,
                       warm_start=False)
```

In [58]:

```
predict_train_data = random_forest_model.predict(X_test)

from sklearn import metrics

print("Accuracy = {0:.3f}".format(metrics.accuracy_score(y_test,predict_train_data)))
```

```
Accuracy = 0.766
```