Submitted By :
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Reg No: 19122013

In [ ]:

```
```

In [ ]:

```
```

Explain the autocorrelation with ab appropriate example.

Autocorrelation is a mathematical representation of the degree of similarity between a given time series and a lagged version of itself over successive time intervals. It is the same as calculating the correlation between two different time series, except autocorrelation uses the same time series twice: once in its original form and once lagged one or more time periods. ¶

In [13]:

```
df1 = read.csv('C:/Users/DELL/Downloads/Temp/Placement_Data_Full_Cl
```

In [14]:

```
head(df1)
```

sl_no	gender	ssc_p	ssc_b	hsc_p	hsc_b	hsc_s	degree_p	degree_t	workex
1	M	67.00	Others	91.00	Others	Commerce	58.00	Sci&Tech	No
2	M	79.33	Central	78.33	Others	Science	77.48	Sci&Tech	Yes
3	M	65.00	Central	68.00	Central	Arts	64.00	Comm&Mgmt	No
4	M	56.00	Central	52.00	Central	Science	52.00	Sci&Tech	No
5	M	85.80	Central	73.60	Central	Commerce	73.30	Comm&Mgmt	No
6	M	55.00	Others	49.80	Others	Science	67.25	Sci&Tech	Yes

In [15]:

```
any(is.na(df1))
```

```
TRUE
```

In [16]:

```
df = df1[rowSums(is.na(df1)) == 0,]
```

Finding Correlation

In [17]:

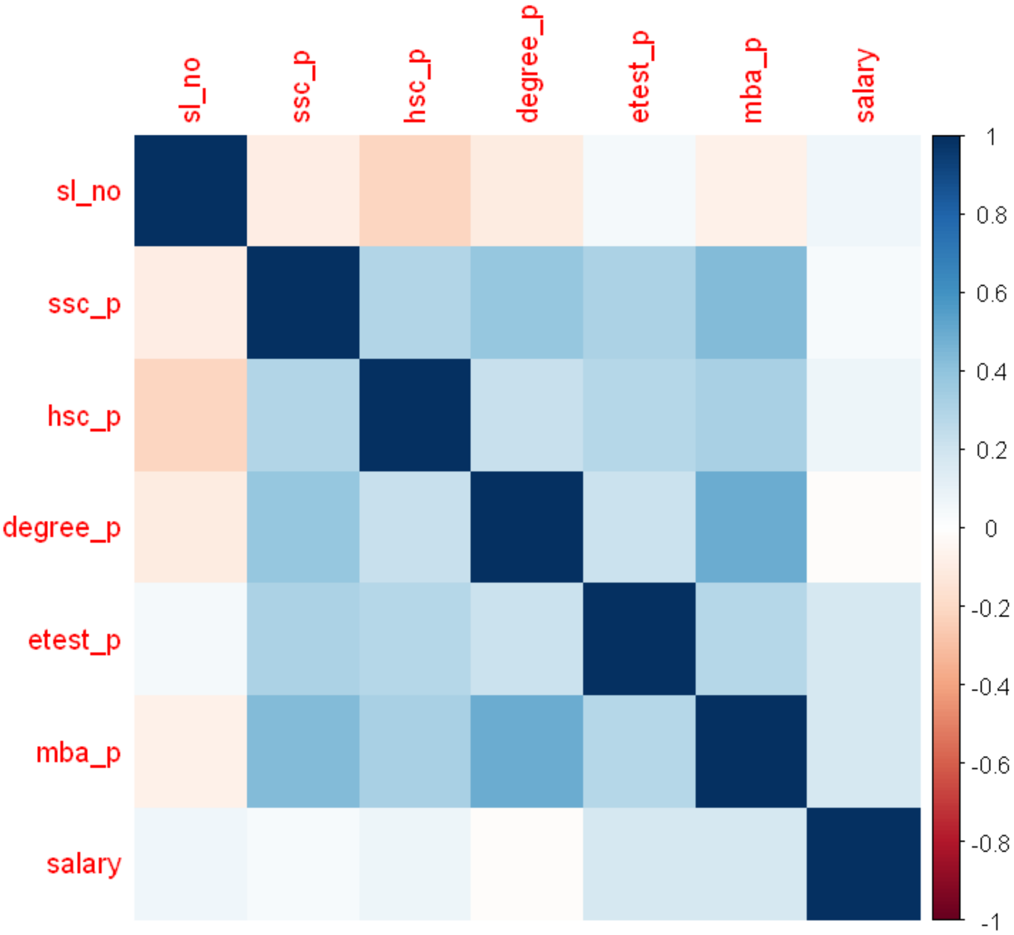
```
#To get only numeric col
num.cols = sapply(df, is.numeric)

#filter to numetic coloums for correlation
cor.data = cor(df[,num.cols])

round(cor.data,2)
```

	sl_no	ssc_p	hsc_p	degree_p	etest_p	mba_p	salary
sl_no	1.00	-0.09	-0.22	-0.10	0.04	-0.07	0.06
ssc_p	-0.09	1.00	0.29	0.38	0.32	0.43	0.04
hsc_p	-0.22	0.29	1.00	0.22	0.28	0.33	0.08
degree_p	-0.10	0.38	0.22	1.00	0.22	0.49	-0.02
etest_p	0.04	0.32	0.28	0.22	1.00	0.28	0.18
mba_p	-0.07	0.43	0.33	0.49	0.28	1.00	0.18
salary	0.06	0.04	0.08	-0.02	0.18	0.18	1.00

In [18]:

```
library(corrplot)
library(corrgram)
```

In [19]:
```
corrplot(cor.data,method='color')
```



In [23]:
```
lm = lm(salary ~ mba_p+etest_p+hsc_p, data=df)
```

In [24]:
```
summary(lm)
```

```

Call:
lm(formula = salary ~ mba_p + etest_p + hsc_p, data = df)

Residuals:
    Min      1Q  Median      3Q     Max 
-119159  -50563  -15194   13975  638267 

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 87421.54   88043.37   0.993    0.322
mba_p        2186.90    1398.70   1.564    0.120
etest_p       964.80     590.35   1.634    0.104
hsc_p         -89.83     882.40  -0.102    0.919

Residual standard error: 92100 on 144 degrees of freedom
Multiple R-squared:  0.04868,	Adjusted R-squared:  0.02886 
F-statistic: 2.456 on 3 and 144 DF,  p-value: 0.06546
```

In [25]:
```
stdres = rstandard(lm)
```

In [26]:
```
print(stdres)
```

```
           1            2            3            5            8 
9 
 0.102882442 -1.190946992 -0.328576284  1.441020728 -0.329710357 -
0.786385117 
          11           12           14           16           17 
20 
-0.162302352 -0.311430933 -0.855980163 -0.998913069  0.260979980 -
0.737151477 
          21           22           23           24           25 
27 
 0.123144217  0.767458703  0.820323344 -0.109714407  0.288686911 -
0.630531446 
          28           29           31           33           34 
36 
-0.089250371  0.637357274 -0.055055129  0.141198483 -0.728114025 
0.151698839 
          38           39           40           41           44 
45 
 0.686016529 -0.202199031  1.133735878  0.029654038 -0.097863824 -
1.308250764 
          48           49           51           54           55 
56 
-0.799401604 -0.330159765 -0.887659944  1.425677060 -0.929394380 -
0.497605156 
          57           58           59           60           61 
62 
-0.577865092  0.689346964 -0.131994340  0.043707292 -0.046012217 
0.252676376
```

```
0.232076370
          63           65           67           68           70

71
-0.318503360 -0.309536465 -0.001254643 -0.055195474 -0.243518008
0.540838206
          72           73           74           75           77
78
-0.871030757 -0.921321406 -0.834001119  0.286709106 -0.552380552
2.499473133
          79           81           82           84           85
86
-0.248255323 -0.468203151 -0.201649510 -0.078939777  0.324644571
0.874331573
          87           89           90           91           93
95
-0.559100638 -0.752699279 -0.731947845 -0.187234483 -0.553392275
0.065480893
          96           97           99          102          103
104
 1.229166851  0.155694175 -0.587926237  0.999582809  0.312506576 -
0.726204118
         105          108          109          111          113
114
 1.073176526 -1.306308087  0.125598010 -0.067808087 -0.064488193 -
0.086239502
         115          116          117          118          119
120
-0.037712517 -0.923182739 -0.314129180 -0.704469846 -0.573805873
6.969514091
         122          123          124          125          126
127
-0.460761286 -0.861153662 -0.263433679 -0.292123711  0.401588799 -
0.974910258
         128          129          130          132          133
134
-0.145945646  0.822704344 -0.732759193  0.743532765  0.329149681 -
0.302860874
         135          136          138          139          140
141
-0.742660768 -0.881067954 -0.470231302 -0.905085499 -0.397569209
0.053179801
         143          144          146          147          148
149
-0.152928320  0.005196124  1.207594400 -0.566540538  0.032181155 -
0.387497140
         151          152          153          154          155
157
 4.613250101 -0.223495278 -0.881297881  0.421446884 -0.171993947 -
0.206145397
         158          161          163          164          165
167
 0.086048104 -0.123512132 -0.127736329  2.194389143 -0.279569535 -
0.189264963
         172          173          175          177          178
```

```
179

 0.041720894  0.240377998  2.344531313 -0.458189945  3.713813927
0.534734584
        181          184          186          188          192
193
 0.057452196  0.026478682 -0.706194485 -0.386354748 -0.227688863 -
0.304085669
        194          196          197          198          200
201
 0.188831282 -0.170582464 -0.287688154 -0.362239397 -0.099019676
0.200412414
        203          204          205          206          208
210
-0.353583612 -0.143098566 -1.049717907 -0.174197390 -0.245730173 -
0.581911972
        211          212          213          214
 0.767465363  0.047474146  0.046389866 -0.836869726
```

R squared value

```
In [27]: summary(lm)$r.squared
```

0.0486824544173291

Durbin-Watson Testing

```
In [32]: library(lmtest)
```

```
In [34]: dwtest(lm)
```

```
	Durbin-Watson test

data:  lm
DW = 2.1641, p-value = 0.8416
alternative hypothesis: true autocorrelation is greater than 0
```