

R version 4.2.1 (2022-06-23) -- "Funny-Looking Kid"
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Platform: x86_64-pc-linux-gnu (64-bit)

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Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

```
> install.packages("ggplot2")
Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
(as 'lib' is unspecified)
trying URL 'http://rspm/default/__linux__/focal/latest/src/contrib/ggplot2_3.3
.6.tar.gz'
Content type 'application/x-gzip' length 4109752 bytes (3.9 MB)
=====
downloaded 3.9 MB
```

```
* installing *binary* package 'ggplot2' ...
* DONE (ggplot2)
```

The downloaded source packages are in
'/tmp/Rtmp0pzhgW/downloaded_packages'

```
> library(ggfortify)
Loading required package: ggplot2
```

Restarting R session...

```
> install.packages("ggplot2")
Installing package into '/cloud/lib/x86_64-pc-linux-gnu-library/4.2'
(as 'lib' is unspecified)
trying URL 'http://rspm/default/__linux__/focal/latest/src/contrib/ggplot2_3.3
.6.tar.gz'
Content type 'application/x-gzip' length 4109752 bytes (3.9 MB)
=====
downloaded 3.9 MB
```

```
* installing *binary* package 'ggplot2' ...
* DONE (ggplot2)
```

The downloaded source packages are in
'/tmp/Rtmp19uHUu/downloaded_packages'

```
> library(ggfortify)
Loading required package: ggplot2
> autoplot(pca, data = data, colour = 'salary')
Error in autoplot(pca, data = data, colour = "salary") :
  object 'pca' not found
> data<- read.csv("HR_comma_sep.csv")
> dim(data)
```

```
[1] 14999      10
> summary(data)
satisfaction_level last_evaluation number_project average_monthly_hours
Min.   :0.0900    Min.   :0.3600    Min.   :2.000    Min.   : 96.0
1st Qu.:0.4400    1st Qu.:0.5600    1st Qu.:3.000    1st Qu.:156.0
Median :0.6400    Median :0.7200    Median :4.000    Median :200.0
Mean   :0.6128    Mean   :0.7161    Mean   :3.803    Mean   :201.1
3rd Qu.:0.8200    3rd Qu.:0.8700    3rd Qu.:5.000    3rd Qu.:245.0
Max.   :1.0000    Max.   :1.0000    Max.   :7.000    Max.   :310.0
time_spend_company Work_accident      left      promotion_last_5years
Min.   : 2.000    Min.   :0.0000    Min.   :0.0000    Min.   :0.00000
1st Qu.: 3.000    1st Qu.:0.0000    1st Qu.:0.0000    1st Qu.:0.00000
Median : 3.000    Median :0.0000    Median :0.0000    Median :0.00000
Mean   : 3.498    Mean   :0.1446    Mean   :0.2381    Mean   :0.02127
3rd Qu.: 4.000    3rd Qu.:0.0000    3rd Qu.:0.0000    3rd Qu.:0.00000
Max.   :10.000    Max.   :1.0000    Max.   :1.0000    Max.   :1.00000
sales      salary
Length:14999      Length:14999
Class :character   Class :character
Mode  :character   Mode  :character

> str(data)
'data.frame':   14999 obs. of  10 variables:
 $ satisfaction_level   : num  0.38 0.8 0.11 0.72 0.37 0.41 0.1 0.92 0.89 0.42
 ...
 $ last_evaluation      : num  0.53 0.86 0.88 0.87 0.52 0.5 0.77 0.85 1 0.53 .
 ..
 $ number_project       : int  2 5 7 5 2 2 6 5 5 2 ...
 $ average_monthly_hours : int  157 262 272 223 159 153 247 259 224 142 ...
 $ time_spend_company   : int  3 6 4 5 3 3 4 5 5 3 ...
 $ Work_accident        : int  0 0 0 0 0 0 0 0 0 0 ...
 $ left                : int  1 1 1 1 1 1 1 1 1 1 ...
 $ promotion_last_5years: int  0 0 0 0 0 0 0 0 0 0 ...
 $ sales                : chr  "sales" "sales" "sales" "sales" ...
 $ salary               : chr  "low" "medium" "medium" "low" ...

> data
satisfaction_level last_evaluation number_project average_monthly_hours
1                0.38              0.53           2                157
2                0.80              0.86           5                262
3                0.11              0.88           7                272
4                0.72              0.87           5                223
5                0.37              0.52           2                159
6                0.41              0.50           2                153
7                0.10              0.77           6                247
8                0.92              0.85           5                259
9                0.89              1.00           5                224
10               0.42              0.53           2                142
11               0.45              0.54           2                135
12               0.11              0.81           6                305
13               0.84              0.92           4                234
14               0.41              0.55           2                148
15               0.36              0.56           2                137
16               0.38              0.54           2                143
17               0.45              0.47           2                160
```

18	0.78	0.99	4	255
19	0.45	0.51	2	160
20	0.76	0.89	5	262
21	0.11	0.83	6	282
22	0.38	0.55	2	147
23	0.09	0.95	6	304
24	0.46	0.57	2	139
25	0.40	0.53	2	158
26	0.89	0.92	5	242
27	0.82	0.87	4	239
28	0.40	0.49	2	135
29	0.41	0.46	2	128
30	0.38	0.50	2	132
31	0.09	0.62	6	294
32	0.45	0.57	2	134
33	0.40	0.51	2	145
34	0.45	0.55	2	140
35	0.84	0.87	4	246
36	0.10	0.94	6	255
37	0.38	0.46	2	137
38	0.45	0.50	2	126
39	0.11	0.89	6	306
40	0.41	0.54	2	152
41	0.87	0.88	5	269
42	0.45	0.48	2	158
43	0.40	0.46	2	127
44	0.10	0.80	7	281
45	0.09	0.89	6	276
46	0.84	0.74	3	182
47	0.40	0.55	2	147
48	0.57	0.70	3	273
49	0.40	0.54	2	148
50	0.43	0.47	2	147
51	0.13	0.78	6	152
52	0.44	0.55	2	135
53	0.38	0.55	2	134
54	0.39	0.54	2	132
55	0.10	0.92	7	307
56	0.37	0.46	2	140
57	0.11	0.94	7	255
58	0.10	0.81	6	309
59	0.38	0.54	2	128
60	0.85	1.00	4	225
61	0.85	0.91	5	226
62	0.11	0.93	7	308
63	0.10	0.95	6	244
64	0.36	0.56	2	132
65	0.11	0.94	6	286
66	0.81	0.70	6	161
67	0.43	0.54	2	153
68	0.90	0.98	4	264
69	0.76	0.86	5	223
70	0.43	0.50	2	135
71	0.74	0.99	2	277
72	0.09	0.77	5	275
73	0.45	0.49	2	149

74	0.09	0.87	7	295	
75	0.11	0.97	6	277	
76	0.11	0.79	7	306	
77	0.10	0.83	6	295	
78	0.40	0.54	2	137	
79	0.43	0.56	2	157	
80	0.39	0.56	2	142	
81	0.45	0.54	2	140	
82	0.38	0.49	2	151	
83	0.79	0.59	4	139	
84	0.84	0.85	4	249	
85	0.11	0.77	6	291	
86	0.11	0.87	6	305	
87	0.17	0.84	5	232	
88	0.44	0.45	2	132	
89	0.37	0.57	2	130	
90	0.10	0.79	6	291	
91	0.40	0.50	2	130	
92	0.89	1.00	5	246	
93	0.42	0.48	2	143	
94	0.46	0.55	2	129	
95	0.09	0.83	6	255	
96	0.37	0.51	2	155	
97	0.10	0.77	6	265	
98	0.10	0.84	6	279	
99	0.11	0.97	6	284	
100	0.90	1.00	5	221	
	time_spend_company	Work_accident	left	promotion_last_5years	sales
1	3	0	1	0	sales
2	6	0	1	0	sales
3	4	0	1	0	sales
4	5	0	1	0	sales
5	3	0	1	0	sales
6	3	0	1	0	sales
7	4	0	1	0	sales
8	5	0	1	0	sales
9	5	0	1	0	sales
10	3	0	1	0	sales
11	3	0	1	0	sales
12	4	0	1	0	sales
13	5	0	1	0	sales
14	3	0	1	0	sales
15	3	0	1	0	sales
16	3	0	1	0	sales
17	3	0	1	0	sales
18	6	0	1	0	sales
19	3	1	1	1	sales
20	5	0	1	0	sales
21	4	0	1	0	sales
22	3	0	1	0	sales
23	4	0	1	0	sales
24	3	0	1	0	sales
25	3	0	1	0	sales
26	5	0	1	0	sales
27	5	0	1	0	sales
28	3	0	1	0	sales

29	3	0	1	0	accounting
30	3	0	1	0	accounting
31	4	0	1	0	accounting
32	3	0	1	0	hr
33	3	0	1	0	hr
34	3	0	1	0	hr
35	6	0	1	0	hr
36	4	0	1	0	technical
37	3	0	1	0	technical
38	3	0	1	0	technical
39	4	0	1	0	technical
40	3	0	1	0	technical
41	5	0	1	0	technical
42	3	0	1	0	technical
43	3	0	1	0	technical
44	4	0	1	0	technical
45	4	0	1	0	technical
46	4	0	1	0	technical
47	3	0	1	0	support
48	6	0	1	0	support
49	3	0	1	0	support
50	3	0	1	0	support
51	2	0	1	0	support
52	3	0	1	0	support
53	3	0	1	0	support
54	3	0	1	0	support
55	4	0	1	0	support
56	3	0	1	0	support
57	4	0	1	0	support
58	4	0	1	0	technical
59	3	0	1	0	technical
60	5	0	1	0	technical
61	5	0	1	0	management
62	4	0	1	0	IT
63	5	0	1	0	IT
64	3	0	1	0	IT
65	4	0	1	0	IT
66	4	0	1	0	IT
67	3	0	1	0	product_mng
68	6	0	1	0	product_mng
69	5	1	1	0	product_mng
70	3	0	1	0	product_mng
71	3	0	1	0	IT
72	4	0	1	0	product_mng
73	3	0	1	0	product_mng
74	4	0	1	0	product_mng
75	4	0	1	0	product_mng
76	4	0	1	0	product_mng
77	4	0	1	0	product_mng
78	3	0	1	0	marketing
79	3	0	1	0	sales
80	3	0	1	0	accounting
81	3	0	1	0	support
82	3	0	1	0	technical
83	3	0	1	1	management
84	6	0	1	0	marketing

85	4	0	1	0	marketing
86	4	0	1	0	marketing
87	3	0	1	0	sales
88	3	0	1	0	sales
89	3	0	1	0	sales
90	4	0	1	0	sales
91	3	0	1	0	sales
92	5	0	1	0	sales
93	3	0	1	0	sales
94	3	0	1	0	sales
95	4	0	1	0	sales
96	3	0	1	0	sales
97	4	0	1	0	sales
98	4	0	1	0	sales
99	4	0	1	0	sales
100	6	0	1	0	sales

salary	
1	low
2	medium
3	medium
4	low
5	low
6	low
7	low
8	low
9	low
10	low
11	low
12	low
13	low
14	low
15	low
16	low
17	low
18	low
19	low
20	low
21	low
22	low
23	low
24	low
25	low
26	low
27	low
28	low
29	low
30	low
31	low
32	low
33	low
34	low
35	low
36	low
37	low
38	low
39	low

40	low
41	low
42	low
43	low
44	low
45	low
46	low
47	low
48	low
49	low
50	low
51	low
52	low
53	low
54	low
55	low
56	low
57	low
58	low
59	low
60	low
61	medium
62	medium
63	medium
64	medium
65	medium
66	medium
67	medium
68	medium
69	medium
70	medium
71	medium
72	medium
73	high
74	low
75	medium
76	medium
77	medium
78	medium
79	low
80	low
81	low
82	low
83	low
84	low
85	low
86	low
87	low
88	low
89	low
90	low
91	low
92	low
93	low
94	low
95	low

96 low
97 low
98 low
99 low
100 medium

[reached 'max' / getOption("max.print") -- omitted 14899 rows]

```
> data_standardize <- as.data.frame(scale(data[1:4]))
```

```
> data_standardize
```

	satisfaction_level	last_evaluation	number_project	average_monthly_hours
1	-0.9364635	-1.08723904	-1.4628141	-0.8820105
2	0.7527892	0.84067890	0.9710806	1.2203821
3	-2.0224116	0.95752241	2.5936770	1.4206099
4	0.4310268	0.89910066	0.9710806	0.4394934
5	-0.9766838	-1.14566080	-1.4628141	-0.8419649
6	-0.8158026	-1.26250431	-1.4628141	-0.9621016
7	-2.0626319	0.31488310	1.7823788	0.9200403
8	1.2354329	0.78225715	0.9710806	1.1603137
9	1.1147720	1.65858348	0.9710806	0.4595162
10	-0.7755823	-1.08723904	-1.4628141	-1.1823523
11	-0.6549214	-1.02881729	-1.4628141	-1.3225118
12	-2.0224116	0.54857012	1.7823788	2.0813619
13	0.9136704	1.19120944	0.1597823	0.6597441
14	-0.8158026	-0.97039553	-1.4628141	-1.0622155
15	-1.0169041	-0.91197378	-1.4628141	-1.2824662
16	-0.9364635	-1.02881729	-1.4628141	-1.1623295
17	-0.6549214	-1.43776958	-1.4628141	-0.8219421
18	0.6723486	1.60016173	0.1597823	1.0802226
19	-0.6549214	-1.20408256	-1.4628141	-0.8219421
20	0.5919080	1.01594417	0.9710806	1.2203821
21	-2.0224116	0.66541363	1.7823788	1.6208378
22	-0.9364635	-0.97039553	-1.4628141	-1.0822383
23	-2.1028522	1.36647470	1.7823788	2.0613391
24	-0.6147010	-0.85355202	-1.4628141	-1.2424206
25	-0.8560229	-1.08723904	-1.4628141	-0.8619877
26	1.1147720	1.19120944	0.9710806	0.8199264
27	0.8332298	0.89910066	0.1597823	0.7598580
28	-0.8560229	-1.32092607	-1.4628141	-1.3225118
29	-0.8158026	-1.49619133	-1.4628141	-1.4626713
30	-0.9364635	-1.26250431	-1.4628141	-1.3825801
31	-2.1028522	-0.56144324	1.7823788	1.8611112
32	-0.6549214	-0.85355202	-1.4628141	-1.3425346
33	-0.8560229	-1.20408256	-1.4628141	-1.1222839
34	-0.6549214	-0.97039553	-1.4628141	-1.2223978
35	0.9136704	0.89910066	0.1597823	0.9000175
36	-2.0626319	1.30805295	1.7823788	1.0802226
37	-0.9364635	-1.49619133	-1.4628141	-1.2824662
38	-0.6549214	-1.26250431	-1.4628141	-1.5027168
39	-2.0224116	1.01594417	1.7823788	2.1013847
40	-0.8158026	-1.02881729	-1.4628141	-0.9821244
41	1.0343314	0.95752241	0.9710806	1.3605416
42	-0.6549214	-1.37934782	-1.4628141	-0.8619877
43	-0.8560229	-1.49619133	-1.4628141	-1.4826941
44	-2.0626319	0.49014837	2.5936770	1.6008150
45	-2.1028522	1.01594417	1.7823788	1.5007011
46	0.9136704	0.13961783	-0.6515159	-0.3814408
47	-0.8560229	-0.97039553	-1.4628141	-1.0822383

48	-0.1722777	-0.09406919	-0.6515159	1.4406327
49	-0.8560229	-1.02881729	-1.4628141	-1.0622155
50	-0.7353620	-1.43776958	-1.4628141	-1.0822383
51	-1.9419710	0.37330485	1.7823788	-0.9821244
52	-0.6951417	-0.97039553	-1.4628141	-1.3225118
53	-0.9364635	-0.97039553	-1.4628141	-1.3425346
54	-0.8962432	-1.02881729	-1.4628141	-1.3825801
55	-2.0626319	1.19120944	2.5936770	2.1214075
56	-0.9766838	-1.49619133	-1.4628141	-1.2223978
57	-2.0224116	1.30805295	2.5936770	1.0802226
58	-2.0626319	0.54857012	1.7823788	2.1614530
59	-0.9364635	-1.02881729	-1.4628141	-1.4626713
60	0.9538907	1.65858348	0.1597823	0.4795390
61	0.9538907	1.13278768	0.9710806	0.4995618
62	-2.0224116	1.24963119	2.5936770	2.1414302
63	-2.0626319	1.36647470	1.7823788	0.8599719
64	-1.0169041	-0.91197378	-1.4628141	-1.3825801
65	-2.0224116	1.30805295	1.7823788	1.7009289
66	0.7930095	-0.09406919	1.7823788	-0.8019193
67	-0.7353620	-1.02881729	-1.4628141	-0.9621016
68	1.1549923	1.54173997	0.1597823	1.2604276
69	0.5919080	0.84067890	0.9710806	0.4394934
70	-0.7353620	-1.26250431	-1.4628141	-1.3225118
71	0.5114674	1.60016173	-1.4628141	1.5207239
72	-2.1028522	0.31488310	0.9710806	1.4806783
73	-0.6549214	-1.32092607	-1.4628141	-1.0421928
74	-2.1028522	0.89910066	2.5936770	1.8811340
75	-2.0224116	1.48331822	1.7823788	1.5207239
76	-2.0224116	0.43172661	2.5936770	2.1013847
77	-2.0626319	0.66541363	1.7823788	1.8811340
78	-0.8560229	-1.02881729	-1.4628141	-1.2824662
79	-0.7353620	-0.91197378	-1.4628141	-0.8820105
80	-0.8962432	-0.91197378	-1.4628141	-1.1823523
81	-0.6549214	-1.02881729	-1.4628141	-1.2223978
82	-0.9364635	-1.32092607	-1.4628141	-1.0021472
83	0.7125689	-0.73670851	0.1597823	-1.2424206
84	0.9136704	0.78225715	0.1597823	0.9600859
85	-2.0224116	0.31488310	1.7823788	1.8010429
86	-2.0224116	0.89910066	1.7823788	2.0813619
87	-1.7810898	0.72383539	0.9710806	0.6196985
88	-0.6951417	-1.55461309	-1.4628141	-1.3825801
89	-0.9766838	-0.85355202	-1.4628141	-1.4226257
90	-2.0626319	0.43172661	1.7823788	1.8010429
91	-0.8560229	-1.26250431	-1.4628141	-1.4226257
92	1.1147720	1.65858348	0.9710806	0.9000175
93	-0.7755823	-1.37934782	-1.4628141	-1.1623295
94	-0.6147010	-0.97039553	-1.4628141	-1.4426485
95	-2.1028522	0.66541363	1.7823788	1.0802226
96	-0.9766838	-1.20408256	-1.4628141	-0.9220560
97	-2.0626319	0.31488310	1.7823788	1.2804504
98	-2.0626319	0.72383539	1.7823788	1.5607694
99	-2.0224116	1.48331822	1.7823788	1.6608834
100	1.1549923	1.65858348	0.9710806	0.3994478
101	-0.9364635	-1.14566080	-1.4628141	-0.9420788
102	-1.0169041	-1.14566080	-1.4628141	-1.0822383
103	-0.7755823	-1.49619133	-1.4628141	-1.0221700

104	-2.1028522	1.30805295	2.5936770	1.3204960
105	-0.7353620	-1.14566080	-1.4628141	-0.8619877
106	-1.4995477	-1.49619133	2.5936770	0.4595162
107	1.1952126	1.65858348	0.1597823	1.1202681
108	-0.6951417	-1.26250431	-1.4628141	-1.0622155
109	0.3908065	0.89910066	-0.6515159	-0.4815547
110	-0.8560229	-1.32092607	-1.4628141	-0.9220560
111	-0.7353620	-1.43776958	-1.4628141	-1.1423067
112	-2.1028522	0.78225715	1.7823788	1.7609973
113	-0.7353620	-1.14566080	-1.4628141	-0.8219421
114	1.1549923	1.42489646	0.1597823	1.1402909
115	0.9136704	1.65858348	0.9710806	0.6597441
116	-0.9766838	-1.37934782	-1.4628141	-1.2824662
117	0.9941111	-0.21091270	0.9710806	1.2404049
118	-2.0224116	0.72383539	1.7823788	1.0001314
119	-0.9766838	-0.85355202	-1.4628141	-1.3625573
120	-0.8560229	-1.49619133	-1.4628141	-1.3825801
121	-1.9017507	-0.56144324	0.1597823	-0.8619877
122	-0.8560229	-1.49619133	-1.4628141	-1.3225118
123	0.5516877	1.65858348	0.1597823	0.2993339
124	-2.0224116	0.72383539	1.7823788	1.9812480
125	-0.6147010	-1.32092607	-1.4628141	-1.2624434
126	-2.0224116	1.19120944	1.7823788	1.1803365
127	-0.9364635	-1.32092607	-1.4628141	-1.3825801
128	0.3505862	1.01594417	-0.6515159	-0.3614180
129	-2.1028522	0.60699188	1.7823788	0.9801086
130	-0.9766838	-1.55461309	-1.4628141	-1.0021472
131	-2.0626319	0.66541363	1.7823788	1.8210657
132	-0.9364635	-0.85355202	-1.4628141	-1.2223978
133	1.1549923	1.65858348	0.9710806	0.3994478
134	-0.6951417	-1.20408256	-1.4628141	-1.2624434
135	-1.0169041	-1.26250431	-1.4628141	-1.3825801
136	-1.2180056	0.72383539	2.5936770	-1.3625573
137	-2.0626319	0.72383539	1.7823788	1.6408606
138	-0.7755823	-1.37934782	-1.4628141	-1.4426485
139	0.5114674	1.65858348	0.1597823	0.9600859
140	0.4712471	0.89910066	0.9710806	1.1202681
141	-2.1028522	1.42489646	1.7823788	0.8799947
142	-0.6549214	-1.08723904	-1.4628141	-0.9220560
143	-2.0224116	0.49014837	1.7823788	1.1002454
144	-0.9766838	-1.43776958	-1.4628141	-0.9821244
145	0.9136704	1.60016173	0.1597823	1.3204960
146	-0.8158026	-1.49619133	-1.4628141	-1.0021472
147	0.5919080	1.19120944	0.1597823	0.7598580
148	-2.0224116	0.89910066	1.7823788	2.1013847
149	0.9136704	0.95752241	0.1597823	1.2404049
150	-0.8962432	-1.26250431	-1.4628141	-1.0822383
151	-2.0224116	1.13278768	1.7823788	1.5407467
152	-0.6549214	-0.91197378	-1.4628141	-0.9420788
153	-0.9766838	-1.14566080	-1.4628141	-1.1623295
154	-0.8560229	-1.14566080	-1.4628141	-0.9220560
155	-0.8962432	-1.37934782	-1.4628141	-0.8219421
156	-2.0224116	0.49014837	1.7823788	2.0613391
157	0.8734501	1.65858348	0.9710806	0.7798808
158	-2.0224116	1.19120944	1.7823788	2.0813619
159	-0.8962432	-1.26250431	-1.4628141	-1.3024890

160	-0.6549214	-1.55461309	-1.4628141	-1.3825801
161	-2.0626319	1.36647470	2.5936770	2.0012707
162	1.1549923	1.54173997	0.9710806	0.8399491
163	-0.6549214	-1.20408256	-1.4628141	-1.0822383
164	0.7125689	1.01594417	0.9710806	0.7598580
165	1.1549923	1.60016173	0.9710806	1.1803365
166	-2.0224116	0.72383539	2.5936770	1.9011568
167	-0.7353620	-0.97039553	-1.4628141	-1.4426485
168	-1.2180056	-1.02881729	0.9710806	-1.3825801
169	-1.1777853	-1.26250431	-1.4628141	-1.3225118
170	-0.6549214	-0.85355202	-1.4628141	-0.8619877
171	0.7930095	1.60016173	0.1597823	1.1603137
172	-0.8158026	-1.49619133	-1.4628141	-0.8219421
173	-2.0224116	0.37330485	2.5936770	1.5407467
174	-2.0626319	0.95752241	1.7823788	1.6608834
175	0.3505862	-1.08723904	-1.4628141	1.4606555
176	-0.2929386	0.13961783	0.1597823	-0.7418510
177	-0.8158026	-1.37934782	-1.4628141	-1.0622155
178	-0.9364635	-1.26250431	-1.4628141	-1.2223978
179	-0.9766838	-1.20408256	-1.4628141	-1.4826941
180	-2.0224116	0.78225715	1.7823788	2.1414302
181	-0.8560229	-1.43776958	-1.4628141	-1.1022611
182	-2.0626319	0.72383539	1.7823788	1.2003593
183	1.1147720	1.60016173	0.9710806	1.1202681
184	-2.0224116	0.49014837	1.7823788	1.6809062
185	-1.0169041	-0.97039553	-1.4628141	-1.2023751
186	-0.8560229	-1.49619133	-1.4628141	-1.4826941
187	-2.1028522	0.78225715	1.7823788	1.9211796
188	-0.8560229	-1.49619133	-1.4628141	-1.1623295
189	-0.9766838	-0.97039553	-1.4628141	-0.9821244
190	-0.6951417	-1.20408256	-1.4628141	-0.9020333
191	-2.1028522	0.49014837	2.5936770	1.6408606
192	1.2354329	0.89910066	0.1597823	0.4995618
193	0.5114674	1.13278768	0.1597823	0.6196985
194	-2.1028522	0.60699188	1.7823788	0.9600859
195	1.1147720	1.36647470	0.1597823	1.4806783
196	-2.1028522	0.49014837	1.7823788	2.0613391
197	-1.3788868	-1.02881729	2.5936770	1.5407467
198	-2.0626319	1.13278768	1.7823788	1.7209517
199	-2.0626319	1.01594417	2.5936770	1.6809062
200	0.6321283	1.30805295	0.9710806	0.4995618
201	1.1549923	0.60699188	0.9710806	1.1603137
202	-0.8962432	-1.26250431	-1.4628141	-1.3225118
203	0.5919080	1.65858348	0.9710806	0.3594023
204	-2.0626319	1.24963119	1.7823788	1.1002454
205	1.0343314	1.07436593	0.9710806	1.0601998
206	-0.9364635	-1.26250431	-1.4628141	-0.9621016
207	0.6321283	1.60016173	0.9710806	0.5396073
208	0.6723486	0.89910066	0.1597823	0.5396073
209	-0.6951417	-1.26250431	-1.4628141	-1.4626713
210	-0.9364635	-1.14566080	-1.4628141	-0.9621016
211	-0.7353620	-1.49619133	-1.4628141	-0.9020333
212	-0.8962432	-1.26250431	0.1597823	1.8611112
213	1.0745517	1.65858348	0.9710806	0.3594023
214	-0.6549214	-1.49619133	-1.4628141	-0.9621016
215	-0.8560229	-1.08723904	-1.4628141	-1.0021472

```

216      -1.0169041      -1.20408256      -1.4628141      -0.9220560
217      -1.0169041      -1.37934782      -1.4628141      -0.8619877
218      1.1549923      1.54173997      0.9710806      0.8799947
219      -0.7353620      -1.08723904      -1.4628141      -1.4026029
220      1.1147720      0.89910066      0.9710806      0.4795390
221      -2.0626319      0.72383539      1.7823788      1.7009289
222      -0.9766838      -1.26250431      -1.4628141      -1.3225118
223      -0.9766838      -1.20408256      -1.4628141      -0.9621016
224      1.0343314      1.07436593      0.9710806      1.0201542
225      -0.8560229      -0.91197378      -1.4628141      -1.0421928
226      1.1549923      1.48331822      0.1597823      1.1402909
227      -0.9766838      -1.49619133      -1.4628141      -0.8619877
228      -0.6951417      -1.02881729      -1.4628141      -1.0421928
229      0.9538907      1.36647470      0.9710806      0.6997896
230      0.6723486      1.54173997      0.9710806      0.7598580
231      -0.7755823      -1.43776958      -1.4628141      -0.8419649
232      1.2354329      1.60016173      0.9710806      1.0802226
233      -2.0224116      0.66541363      1.7823788      0.8599719
234      -0.7755823      -0.91197378      -1.4628141      -1.3425346
235      -0.5342604      -0.85355202      0.1597823      1.3805644
236      0.8734501      0.78225715      0.1597823      1.0802226
237      -0.8560229      -1.08723904      -1.4628141      -1.0021472
238      -0.7353620      -1.55461309      -1.4628141      -1.3225118
239      -0.7353620      -1.08723904      -1.4628141      -1.1022611
240      -2.0626319      1.48331822      2.5936770      1.0601998
241      -2.0626319      0.89910066      2.5936770      1.7609973
242      -0.9766838      -1.49619133      -1.4628141      -0.9020333
243      -0.9364635      -1.08723904      -1.4628141      -0.9020333
244      -0.8560229      -1.26250431      -1.4628141      -1.4626713
245      1.1147720      0.84067890      0.9710806      1.4806783
246      -0.6549214      -1.49619133      -1.4628141      -0.9220560
247      -0.9766838      -1.37934782      -1.4628141      -0.8419649
248      -0.6147010      -1.32092607      -1.4628141      -1.0622155
249      1.0343314      1.13278768      0.1597823      0.5396073
250      -2.0224116      0.72383539      1.7823788      1.9412024

```

```
[ reached 'max' / getOption("max.print") -- omitted 14749 rows ]
```

```
> data.mat <- as.matrix(data_standardize)
```

```
> cov.mat <- cor(data_standardize)
```

```
> cov.mat
```

```

               satisfaction_level last_evaluation number_project
satisfaction_level      1.00000000      0.1050212      -0.1429696
last_evaluation          0.1050212      1.0000000      0.3493326
number_project          -0.14296959      0.3493326      1.0000000
average_monthly_hours    -0.02004811      0.3397418      0.4172106

```

```
               average_monthly_hours
```

```

satisfaction_level      -0.02004811
last_evaluation          0.33974180
number_project           0.41721063
average_monthly_hours    1.00000000

```

```
> pca <- prcomp(data_standardize,center = T,scale. = T)
```

```
> summary(pca)
```

```
Importance of components:
```

```

               PC1      PC2      PC3      PC4
Standard deviation  1.3194  1.0347  0.7990  0.7418
Proportion of Variance 0.4352 0.2677 0.1596 0.1376
Cumulative Proportion 0.4352 0.7029 0.8624 1.0000

```

```
> library(ggfortify)
> autoplot(pca, data = data, colour = 'salary')
Session restored from your saved work on 2022-Sep-20 19:01:49 UTC (13 minutes ago)
```

