

gapminder

```
# A tibble: 1,704 x 6
  country      continent  year lifeExp      pop gdpPercap
  <fct>        <fct>    <int>   <dbl>    <int>    <dbl>
1 Afghanistan Asia      1952    28.8  8425333    779.
2 Afghanistan Asia      1957    30.3  9240934    821.
3 Afghanistan Asia      1962    32.0 10267083    853.
4 Afghanistan Asia      1967    34.0 11537966    836.
5 Afghanistan Asia      1972    36.1 13079460    740.
6 Afghanistan Asia      1977    38.4 14880372    786.
7 Afghanistan Asia      1982    39.9 12881816    978.
8 Afghanistan Asia      1987    40.8 13867957    852.
9 Afghanistan Asia      1992    41.7 16317921    649.
10 Afghanistan Asia      1997    41.8 22227415    635.
# ... with 1,694 more rows
```

```
gapminder %>%
```

```
  select(-c(pop, gdpPercap))
```

```
# A tibble: 1,704 x 4
```

	country	continent	year	lifeExp
	<fct>	<fct>	<int>	<dbl>
1	Afghanistan	Asia	1952	28.8
2	Afghanistan	Asia	1957	30.3
3	Afghanistan	Asia	1962	32.0
4	Afghanistan	Asia	1967	34.0
5	Afghanistan	Asia	1972	36.1
6	Afghanistan	Asia	1977	38.4
7	Afghanistan	Asia	1982	39.9
8	Afghanistan	Asia	1987	40.8
9	Afghanistan	Asia	1992	41.7
10	Afghanistan	Asia	1997	41.8

```
# ... with 1,694 more rows
```

```
gapminder %>%  
  select(-c(pop, gdpPercap)) %>%  
  group_by(country, continent)
```

```
# A tibble: 1,704 x 4  
# Groups:   country, continent [142]  
  country      continent  year lifeExp  
  <fct>        <fct>    <int>   <dbl>  
1 Afghanistan Asia      1952    28.8  
2 Afghanistan Asia      1957    30.3  
3 Afghanistan Asia      1962    32.0  
4 Afghanistan Asia      1967    34.0  
5 Afghanistan Asia      1972    36.1  
6 Afghanistan Asia      1977    38.4  
7 Afghanistan Asia      1982    39.9  
8 Afghanistan Asia      1987    40.8  
9 Afghanistan Asia      1992    41.7  
10 Afghanistan Asia      1997    41.8  
# ... with 1,694 more rows
```

```
gapminder %>%  
  select(-c(pop, gdpPercap)) %>%  
  group_by(country, continent) %>%  
  nest()
```

```
# A tibble: 142 x 3  
# Groups:   country, continent [142]  
  country      continent data  
  <fct>        <fct>    <list>  
1 Afghanistan Asia      <tibble [12 x 2]>  
2 Albania      Europe    <tibble [12 x 2]>  
3 Algeria      Africa    <tibble [12 x 2]>  
4 Angola       Africa    <tibble [12 x 2]>  
5 Argentina    Americas  <tibble [12 x 2]>  
6 Australia    Oceania   <tibble [12 x 2]>  
7 Austria      Europe    <tibble [12 x 2]>  
8 Bahrain      Asia      <tibble [12 x 2]>  
9 Bangladesh   Asia      <tibble [12 x 2]>  
10 Belgium     Europe    <tibble [12 x 2]>  
# ... with 132 more rows
```

```
gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
    ~lm(lifeExp ~ year, data = .x)),
    results = map(model, broom::glance))
```

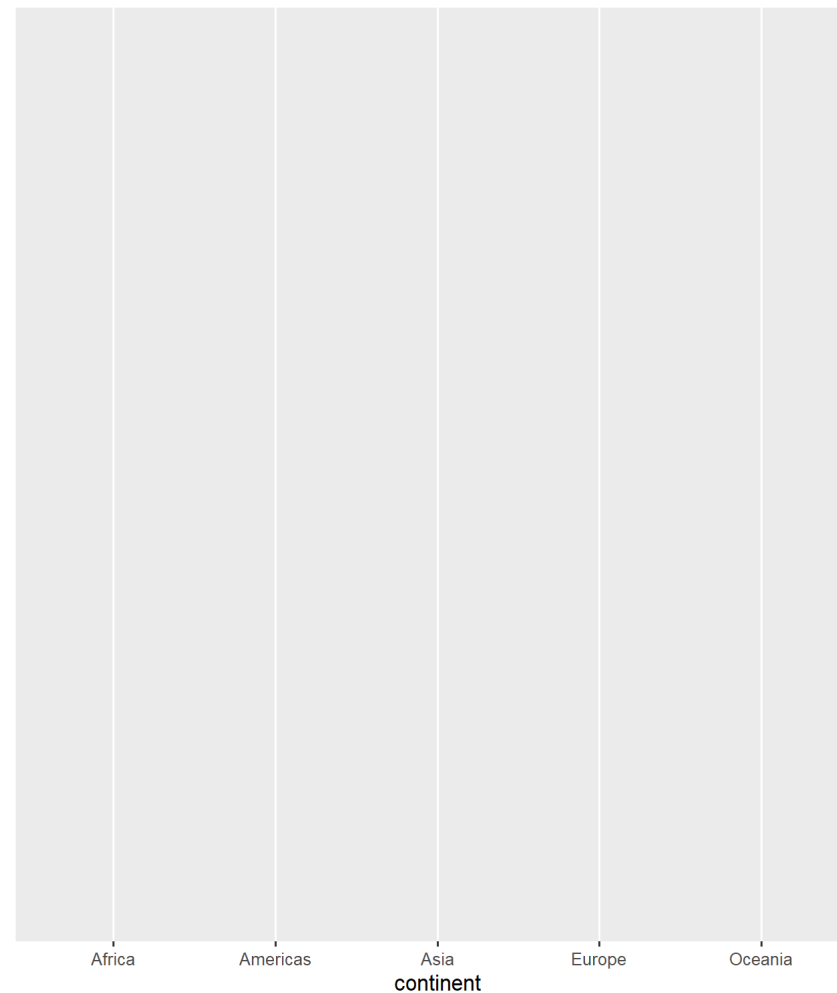
```
# A tibble: 142 x 5
# Groups:   country, continent [142]
  country      continent data          model results
  <fct>        <fct>    <list>      <list> <list>
1 Afghanistan Asia      <tibble [12 x 2]> <lm>    <tibble [1 x
2 Albania      Europe    <tibble [12 x 2]> <lm>    <tibble [1 x
3 Algeria      Africa    <tibble [12 x 2]> <lm>    <tibble [1 x
4 Angola       Africa    <tibble [12 x 2]> <lm>    <tibble [1 x
5 Argentina    Americas <tibble [12 x 2]> <lm>    <tibble [1 x
6 Australia    Oceania   <tibble [12 x 2]> <lm>    <tibble [1 x
7 Austria      Europe    <tibble [12 x 2]> <lm>    <tibble [1 x
8 Bahrain      Asia      <tibble [12 x 2]> <lm>    <tibble [1 x
9 Bangladesh   Asia      <tibble [12 x 2]> <lm>    <tibble [1 x
10 Belgium     Europe    <tibble [12 x 2]> <lm>    <tibble [1 x
# ... with 132 more rows
```

```
gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
    ~lm(lifeExp ~ year, data = .x)),
    results = map(model, broom::glance)) %>%
  unnest(results)
```

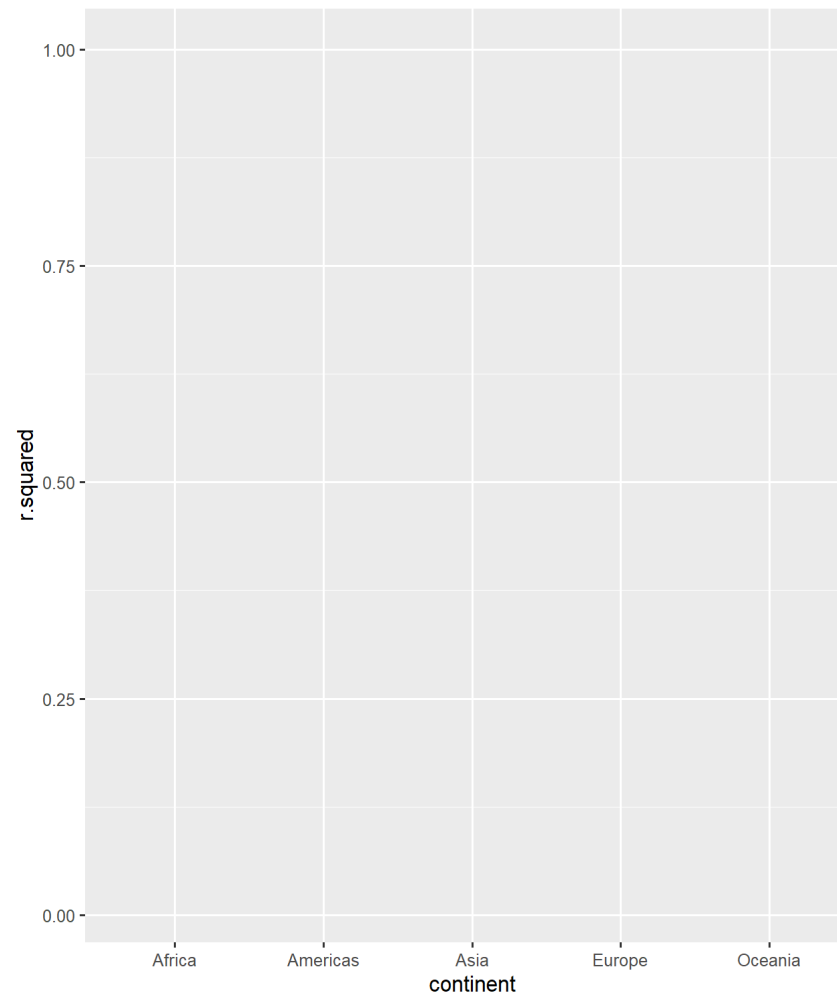
```
# A tibble: 142 x 15
# Groups:   country, continent [142]
  country continent data model r.squared adj.r.squared sigma
  <fct>    <fct>    <lis> <lis>    <dbl>         <dbl> <dbl>
1 Afghan~ Asia      <tib~ <lm>      0.948         0.942 1.22
2 Albania Europe     <tib~ <lm>      0.911         0.902 1.98
3 Algeria Africa     <tib~ <lm>      0.985         0.984 1.32
4 Angola  Africa     <tib~ <lm>      0.888         0.877 1.41
5 Argent~ Americas  <tib~ <lm>      0.996         0.995 0.292
6 Austra~ Oceania   <tib~ <lm>      0.980         0.978 0.621
7 Austria Europe     <tib~ <lm>      0.992         0.991 0.407
8 Bahrain Asia       <tib~ <lm>      0.967         0.963 1.64
9 Bangla~ Asia       <tib~ <lm>      0.989         0.988 0.977
10 Belgium Europe    <tib~ <lm>      0.995         0.994 0.293
# ... with 132 more rows, and 5 more variables: logLik <dbl>, A
#   deviance <dbl>, df.residual <int>
```

```
gapminder %>%  
  select(-c(pop, gdpPercap)) %>%  
  group_by(country, continent) %>%  
  nest() %>%  
  mutate(model = map(data,  
                      ~lm(lifeExp ~ year, data = .x)),  
         results = map(model, broom::glance)) %>%  
  unnest(results) %>%  
  ggplot()
```

```
gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
                      ~lm(lifeExp ~ year, data = .x)),
         results = map(model, broom::glance)) %>%
  unnest(results) %>%
  ggplot()+
  aes(x = continent)
```



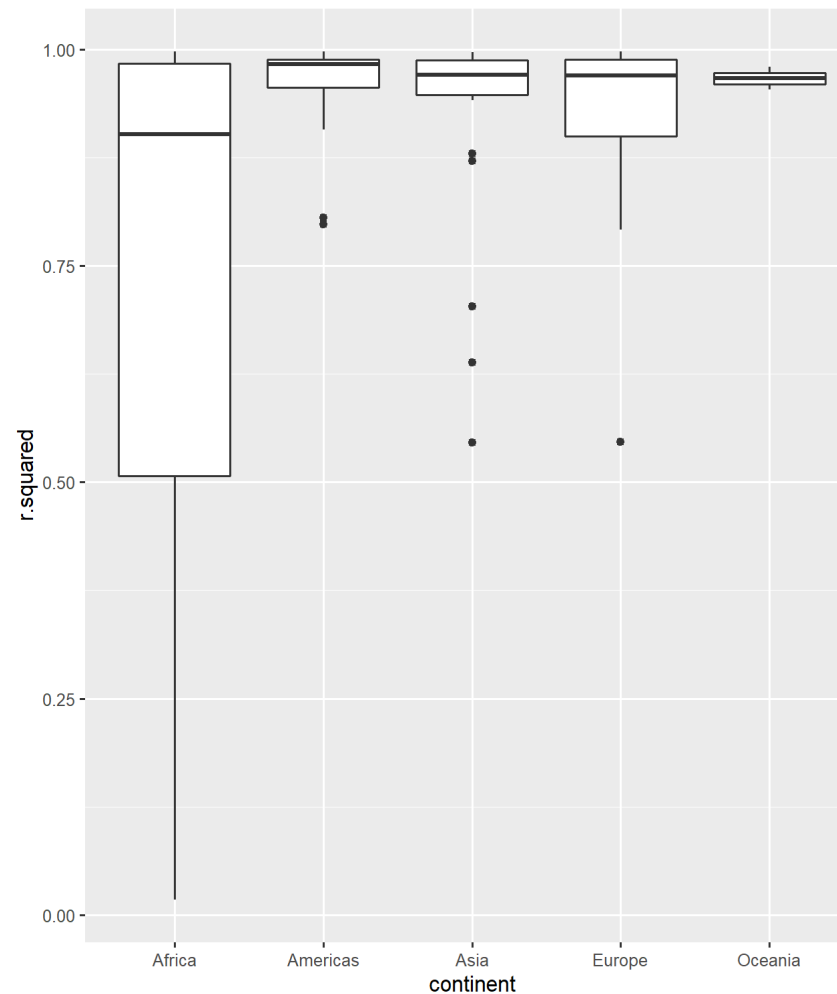

```
gapminder %>%  
  select(-c(pop, gdpPercap)) %>%  
  group_by(country, continent) %>%  
  nest() %>%  
  mutate(model = map(data,  
                      ~lm(lifeExp ~ year, data = .x)),  
         results = map(model, broom::glance)) %>%  
  unnest(results) %>%  
  ggplot()+  
  aes(x = continent)+  
  aes(y = r.squared)
```



```

gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
                      ~lm(lifeExp ~ year, data = .x)),
         results = map(model, broom::glance)) %>%
  unnest(results) %>%
  ggplot()+
  aes(x = continent)+
  aes(y = r.squared)+
  geom_boxplot()

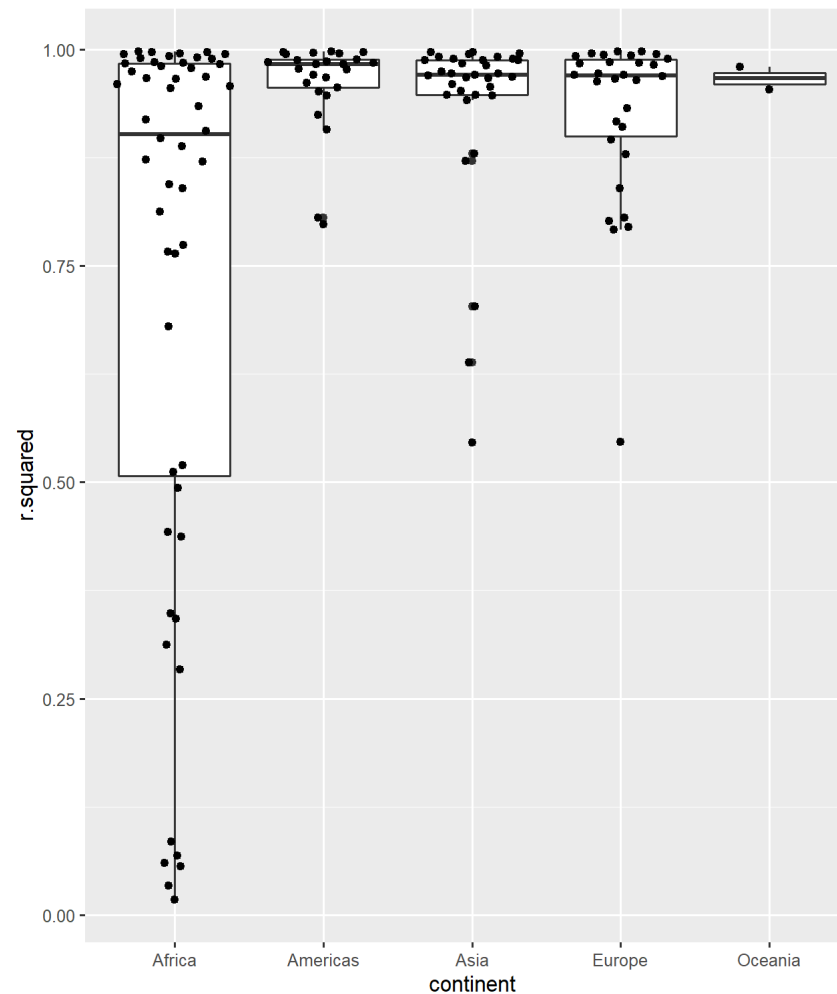
```



```

gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
    ~lm(lifeExp ~ year, data = .x)),
    results = map(model, broom::glance)) %>%
  unnest(results) %>%
  ggplot()+
  aes(x = continent)+
  aes(y = r.squared)+
  geom_boxplot()+
  ggbeeswarm::geom_quasirandom()

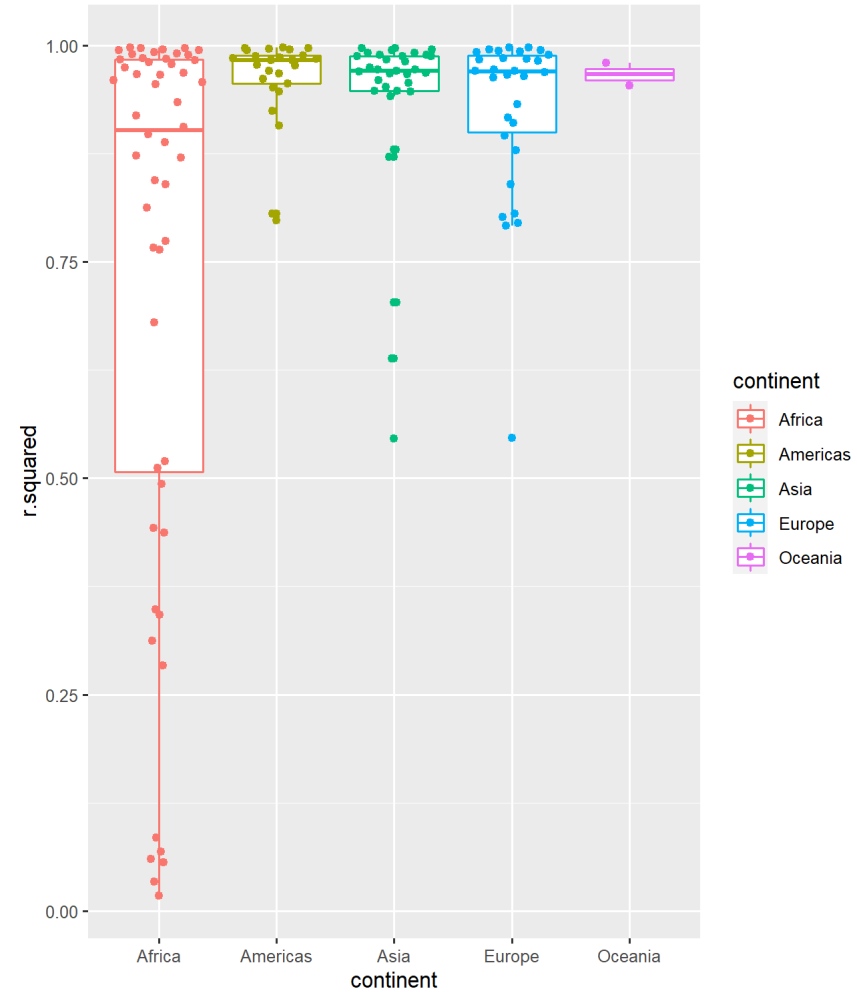
```



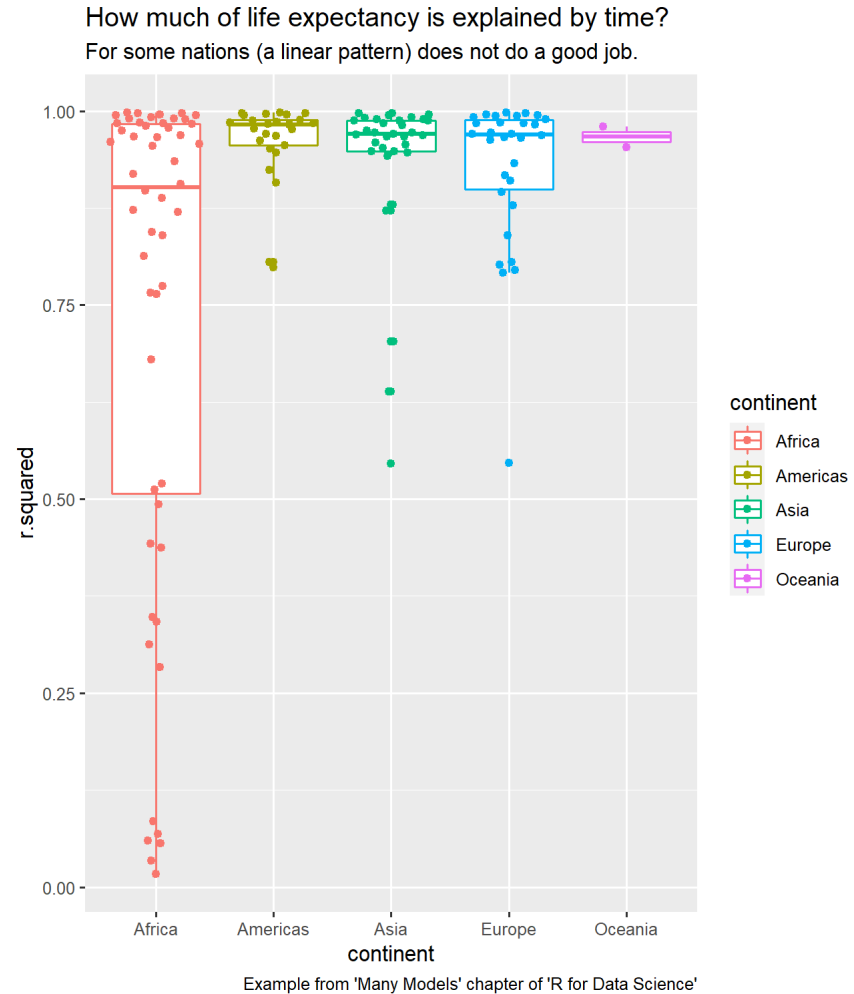
```

gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
    ~lm(lifeExp ~ year, data = .x)),
    results = map(model, broom::glance)) %>%
  unnest(results) %>%
  ggplot()+
  aes(x = continent)+
  aes(y = r.squared)+
  geom_boxplot()+
  ggbeeswarm::geom_quasirandom()+
  aes(colour = continent)

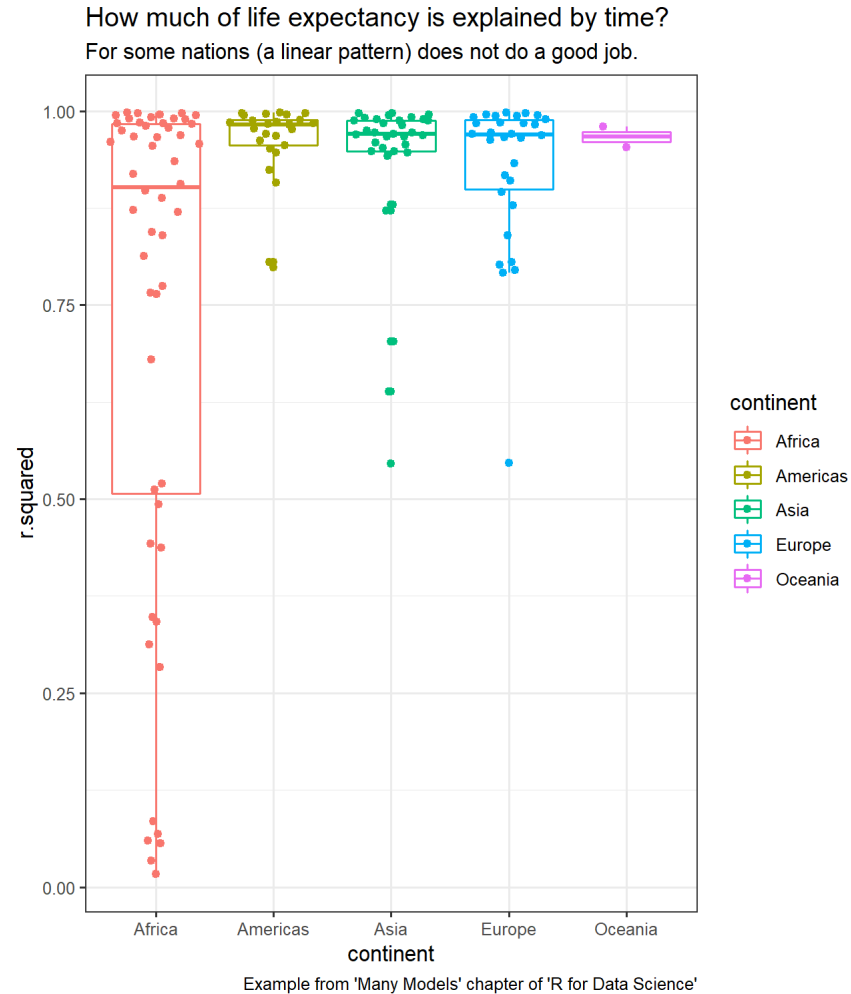
```



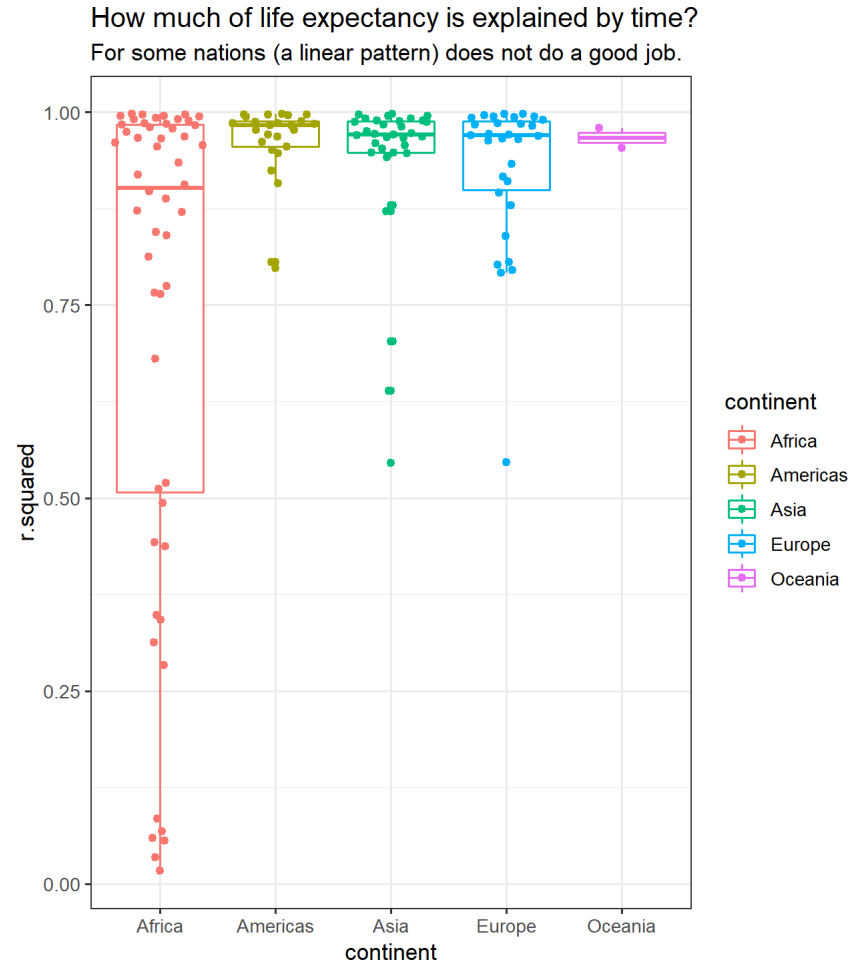
```
gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
    ~lm(lifeExp ~ year, data = .x)),
    results = map(model, broom::glance)) %>%
  unnest(results) %>%
  ggplot()+
  aes(x = continent)+
  aes(y = r.squared)+
  geom_boxplot()+
  ggbeeswarm::geom_quasirandom()+
  aes(colour = continent)+
  labs(title = "How much of life expectancy is explained",
    subtitle = "For some nations (a linear pattern) does not do a good job.",
    caption = "Example from 'Many Models' chapter c
```



```
gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
    ~lm(lifeExp ~ year, data = .x)),
    results = map(model, broom::glance)) %>%
  unnest(results) %>%
  ggplot()+
  aes(x = continent)+
  aes(y = r.squared)+
  geom_boxplot()+
  ggbeeswarm::geom_quasirandom()+
  aes(colour = continent)+
  labs(title = "How much of life expectancy is explained",
    subtitle = "For some nations (a linear pattern) does not do a good job.",
    caption = "Example from 'Many Models' chapter of 'R for Data Science'",
    theme_bw())
```



```
gapminder %>%
  select(-c(pop, gdpPercap)) %>%
  group_by(country, continent) %>%
  nest() %>%
  mutate(model = map(data,
    ~lm(lifeExp ~ year, data = .x)),
    results = map(model, broom::glance)) %>%
  unnest(results) %>%
  ggplot()+
  aes(x = continent)+
  aes(y = r.squared)+
  geom_boxplot()+
  ggbeeswarm::geom_quasirandom()+
  aes(colour = continent)+
  labs(title = "How much of life expectancy is explained",
    subtitle = "For some nations (a linear pattern)",
    caption = "Example from 'Many Models' chapter c",
    theme_bw()+
    theme(text = element_text(size = 11.5))
```



Example from 'Many Models' chapter of 'R for Data Science'