

# Assignment 1

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## Excercise 1 - R syntax & data structures

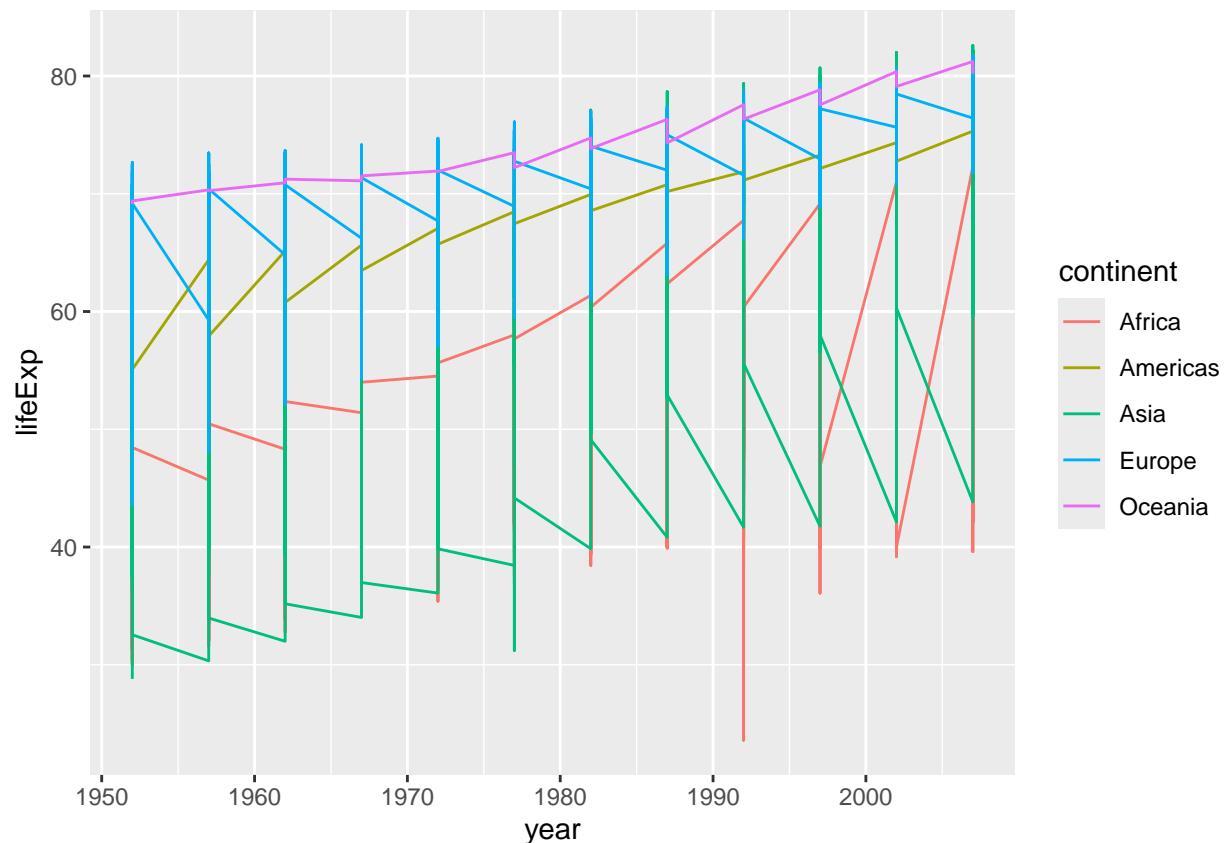
(a)

```
gapminder <- read.csv("gapminder.csv")
summary(gapminder)
```

```
##           X           country           continent           year
## Min.      : 1.0   Length:1704   Length:1704   Min.      :1952
## 1st Qu.: 426.8   Class :character Class :character 1st Qu.:1966
## Median : 852.5   Mode  :character Mode  :character Median :1980
## Mean    : 852.5                                     Mean    :1980
## 3rd Qu.:1278.2                                     3rd Qu.:1993
## Max.    :1704.0                                     Max.    :2007
##      lifeExp      pop      gdpPercap
## Min.    :23.60   Min.    :6.001e+04   Min.    : 241.2
## 1st Qu.:48.20   1st Qu.:2.794e+06   1st Qu.: 1202.1
## Median :60.71   Median :7.024e+06   Median : 3531.8
## Mean    :59.47   Mean    :2.960e+07   Mean    : 7215.3
## 3rd Qu.:70.85   3rd Qu.:1.959e+07   3rd Qu.: 9325.5
## Max.    :82.60   Max.    :1.319e+09   Max.    :113523.1
```

(b)

```
gapminder %>%
  ggplot(aes(x=year, y=lifeExp, colour=continent)) +
  geom_line()
```



(c)

```
gapminder %>%
  group_by(continent, year) %>%
  summarise_at(vars(lifeExp), list(Min = min, Med = median, Mean = mean, Max = max, Sd = sd)) %>%
  data.frame()
```

##	continent	year	Min	Med	Mean	Max	Sd
## 1	Africa	1952	30.000	38.8330	39.13550	52.724	5.15158143
## 2	Africa	1957	31.570	40.5925	41.26635	58.089	5.62012285
## 3	Africa	1962	32.767	42.6305	43.31944	60.246	5.87536393
## 4	Africa	1967	34.113	44.6985	45.33454	61.557	6.08267263
## 5	Africa	1972	35.400	47.0315	47.45094	64.274	6.41625832
## 6	Africa	1977	36.788	49.2725	49.58042	67.064	6.80819741
## 7	Africa	1982	38.445	50.7560	51.59287	69.885	7.37594009
## 8	Africa	1987	39.906	51.6395	53.34479	71.913	7.86408911
## 9	Africa	1992	23.599	52.4290	53.62958	73.615	9.46107099
## 10	Africa	1997	36.087	52.7590	53.59827	74.772	9.10338658
## 11	Africa	2002	39.193	51.2355	53.32523	75.744	9.58649585
## 12	Africa	2007	39.613	52.9265	54.80604	76.442	9.63078067
## 13	Americas	1952	37.579	54.7450	53.27984	68.750	9.32608188
## 14	Americas	1957	40.696	56.0740	55.96028	69.960	9.03319228
## 15	Americas	1962	43.428	58.2990	58.39876	71.300	8.50354374
## 16	Americas	1967	45.032	60.5230	60.41092	72.130	7.90917104
## 17	Americas	1972	46.714	63.4410	62.39492	72.880	7.32301680
## 18	Americas	1977	49.923	66.3530	64.39156	74.210	7.06949562

```
## 19 Americas 1982 51.461 67.4050 66.22884 75.760 6.72083382
## 20 Americas 1987 53.636 69.4980 68.09072 76.860 5.80192884
## 21 Americas 1992 55.089 69.8620 69.56836 77.950 5.16710381
## 22 Americas 1997 56.671 72.1460 71.15048 78.610 4.88758390
## 23 Americas 2002 58.137 72.0470 72.42204 79.770 4.79970550
## 24 Americas 2007 60.916 72.8990 73.60812 80.653 4.44094763
## 25 Asia 1952 28.801 44.8690 46.31439 65.390 9.29175070
## 26 Asia 1957 30.332 48.2840 49.31854 67.840 9.63542862
## 27 Asia 1962 31.997 49.3250 51.56322 69.390 9.82063194
## 28 Asia 1967 34.020 53.6550 54.66364 71.430 9.65096458
## 29 Asia 1972 36.088 56.9500 57.31927 73.420 9.72270004
## 30 Asia 1977 31.220 60.7650 59.61056 75.380 10.02219698
## 31 Asia 1982 39.854 63.7390 62.61794 77.110 8.53522141
## 32 Asia 1987 40.822 66.2950 64.85118 78.670 8.20379188
## 33 Asia 1992 41.674 68.6900 66.53721 79.360 8.07554897
## 34 Asia 1997 41.763 70.2650 68.02052 80.690 8.09117061
## 35 Asia 2002 42.129 71.0280 69.23388 82.000 8.37459539
## 36 Asia 2007 43.828 72.3960 70.72848 82.603 7.96372447
## 37 Europe 1952 43.585 65.9000 64.40850 72.670 6.36108825
## 38 Europe 1957 48.079 67.6500 66.70307 73.470 5.29580539
## 39 Europe 1962 52.098 69.5250 68.53923 73.680 4.30249956
## 40 Europe 1967 54.336 70.6100 69.73760 74.160 3.79972850
## 41 Europe 1972 57.005 70.8850 70.77503 74.720 3.24057637
## 42 Europe 1977 59.507 72.3350 71.93777 76.110 3.12102998
## 43 Europe 1982 61.036 73.4900 72.80640 76.990 3.21826030
## 44 Europe 1987 63.108 74.8150 73.64217 77.410 3.16968034
## 45 Europe 1992 66.146 75.4510 74.44010 78.770 3.20978109
## 46 Europe 1997 68.835 76.1160 75.50517 79.390 3.10467655
## 47 Europe 2002 70.845 77.5365 76.70060 80.620 2.92217958
## 48 Europe 2007 71.777 78.6085 77.64860 81.757 2.97981266
## 49 Oceania 1952 69.120 69.2550 69.25500 69.390 0.19091883
## 50 Oceania 1957 70.260 70.2950 70.29500 70.330 0.04949747
## 51 Oceania 1962 70.930 71.0850 71.08500 71.240 0.21920310
## 52 Oceania 1967 71.100 71.3100 71.31000 71.520 0.29698485
## 53 Oceania 1972 71.890 71.9100 71.91000 71.930 0.02828427
## 54 Oceania 1977 72.220 72.8550 72.85500 73.490 0.89802561
## 55 Oceania 1982 73.840 74.2900 74.29000 74.740 0.63639610
## 56 Oceania 1987 74.320 75.3200 75.32000 76.320 1.41421356
## 57 Oceania 1992 76.330 76.9450 76.94500 77.560 0.86974134
## 58 Oceania 1997 77.550 78.1900 78.19000 78.830 0.90509668
## 59 Oceania 2002 79.110 79.7400 79.74000 80.370 0.89095454
## 60 Oceania 2007 80.204 80.7195 80.71950 81.235 0.72902709
```

(d)

```
gapminder %>%
  group_by(continent, year) %>%
  summarise(Mean_lifeExp= mean(lifeExp, na.rm=T)) %>%
  ggplot(aes(x=year, y=Mean_lifeExp)) +
  geom_ribbon(aes(ymin= Mean_lifeExp - sd(Mean_lifeExp), ymax = Mean_lifeExp + sd(Mean_lifeExp)), fill = "#fdd876") +
  geom_line() +
  facet_grid(.~continent)
```

## `summarise()` has grouped output by 'continent'. You can override using the

## `.groups` argument.

