Internal Assessment 1
ECON0791
Department of Economics
Presidency University, Kolkata
Full Marks: 15
27/12/2022

Answer the following questions using R: [4+3+4+4]

1. Using the `HDI.xlsx` data calculate the HDI dimension indices and the HDI values using the following formula

$$DimensionIndex = \frac{\text{actual value} - \text{minimum value}}{\text{maximum value} - \text{minimum value}}$$

$$HDI = (I_{health} \times I_{education} \times I_{income})^{1/3}$$

for health, income, and education respectively for all the countries. Refer to the following table for the minimum and maximum values:

Dimension	Indicator	Minimum	Maximum
Health	Life Expectancy (years	20	85
Education	Expected years of schooling (years	0	18
	Mean years of schooling (years)	0	15
Standard of Living	GNI percapita (2011 PPP $)	100	75000

The actual values are in the data. Note that the *knowledge dimension index* is the average of the dimension index for the expected years of schooling, and the mean years of schooling.

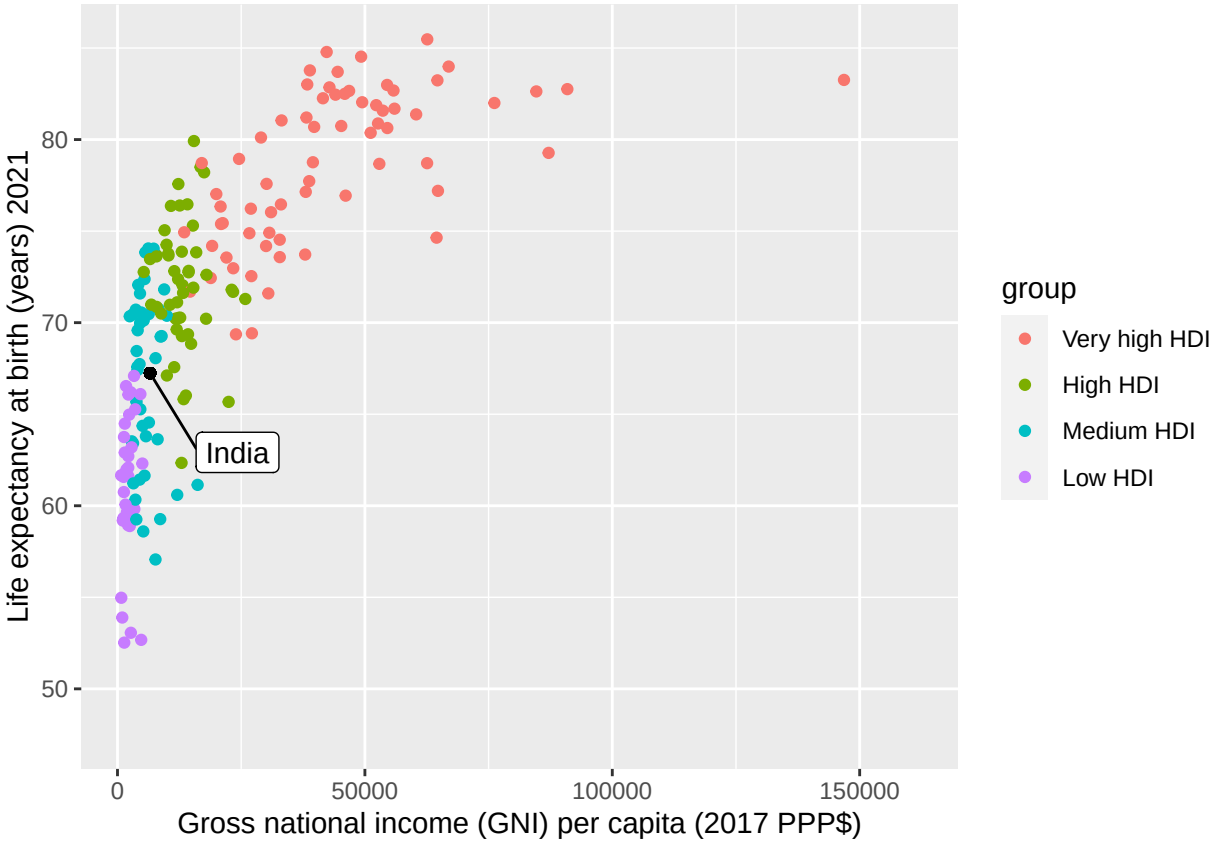
2. Create a factor variable `classification` that takes the values according to the HDI values in the table given below

Classification	HDI
Very high HDI	0.800 and above
High HDI	0.700 - 0.799
Medium HDI	0.550 - 0.699
Low HDI	Below 0.550

and then summarize the min, max, standard deviation, and mean for each group. The output is shown in the table below.

```
## # A tibble: 4 x 5
##   group           min   max     sd average
##   <fct>         <dbl> <dbl>  <dbl>   <dbl>
## 1 Very high HDI 0.800 0.979 0.0568   0.882
## 2 High HDI      0.703 0.796 0.0279   0.746
## 3 Medium HDI    0.550 0.699 0.0462   0.623
## 4 Low HDI       0.385 0.549 0.0469   0.484
```

3. Replicate the following plot using the same data. Note that the colour of the circle indicates the HDI value of the country.



4. Using the `HDI_TS.xlsx` data, plot bar graphs for China, India, and United States and comment on the trend of HDI during the years 2018 to 2021.