Gabriel Krishnadasan
Module 1 Assignment

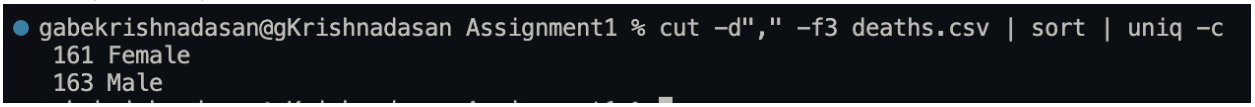
1. The Exercise 1 Dataset (located in your assignment prompt in Canvas) contains a portion of the data from NYC about causes of death for the year 2010.

   Dataset format: CSV

   Field names (in order): Year, Ethnicity, Sex, Cause of Death, Death Count.

   Answer the following questions from this data using UNIX commands.

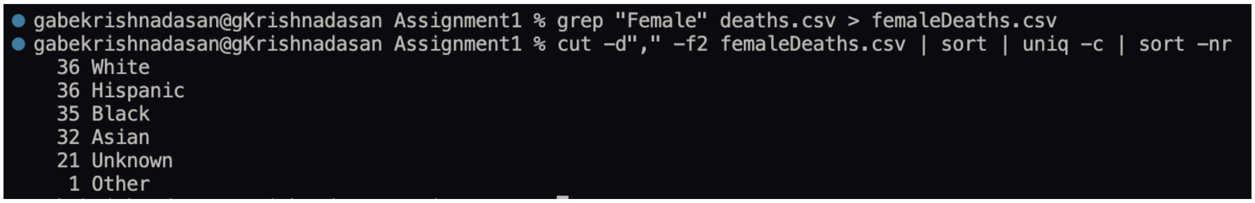
   1.1: How many male record groups and how many female record groups does the data have? (8 points)



```
● gabekrishnadasan@gKrishnadasan Assignment1 % cut -d"," -f3 deaths.csv | sort | uniq -c
   161 Female
   163 Male
```

   1) Used cut to get the necessary column (sex column)
   2) Piped information into sort, to prepare for uniq
   3) Used uniq to count the amount of male and female

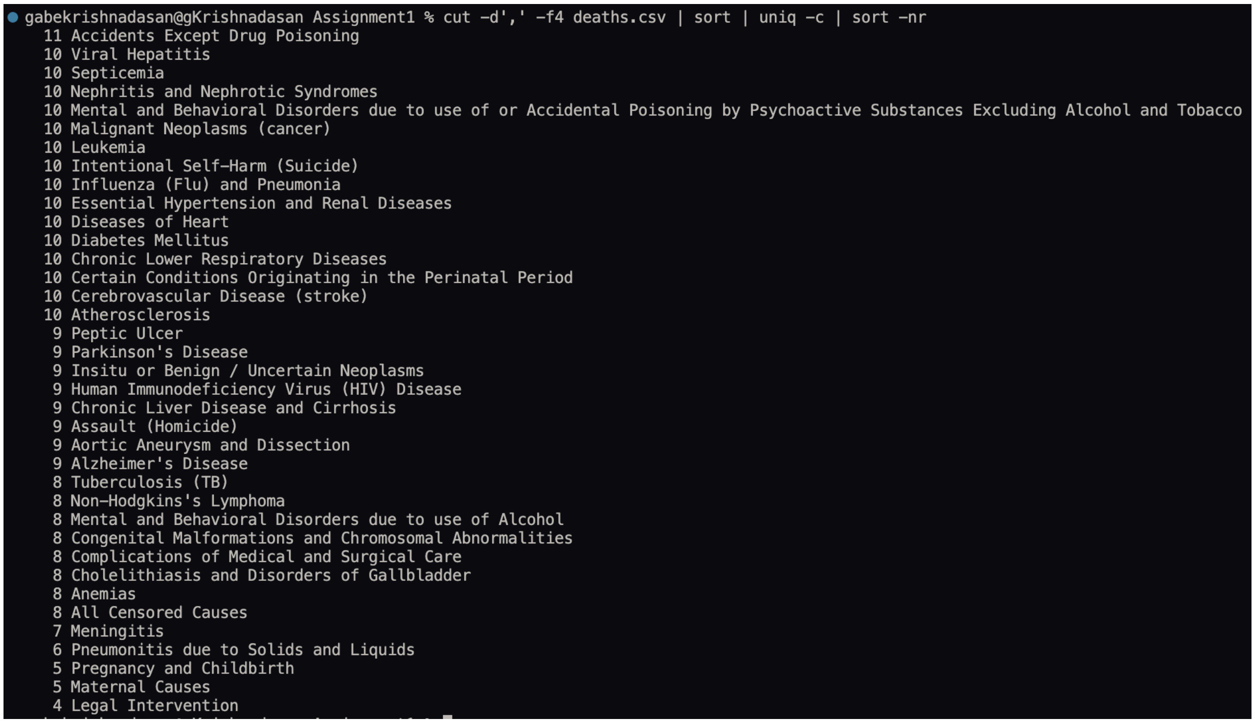
   1.2: How many white female groups are there? Copy entire records of females to a new text file where the records are organized by death count in descending order. (8 points)



```
● gabekrishnadasan@gKrishnadasan Assignment1 % grep "Female" deaths.csv > femaleDeaths.csv
● gabekrishnadasan@gKrishnadasan Assignment1 % cut -d"," -f2 femaleDeaths.csv | sort | uniq -c | sort -nr
    36 White
    36 Hispanic
    35 Black
    32 Asian
    21 Unknown
     1 Other
```

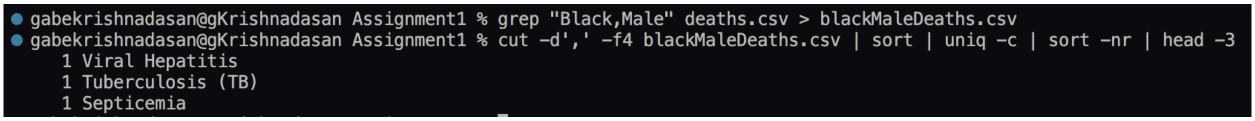
   1) Copied all female information into a file called “femaleDeaths.csv”
   2) Used cut on the new file to gather Ethnicity data
   3) Piped the Ethnicity data into sort to prepare for uniq
   4) Used uniq to count different Ethnicities
   5) Piped that data into sort in reverse order

1.3: List all causes of death by their counts in descending order; do not worry about summing any rows together, just sort the count of causes of death column. What are the three most common causes of death for black males, and five least common causes of death for hispanic females? (10 points)



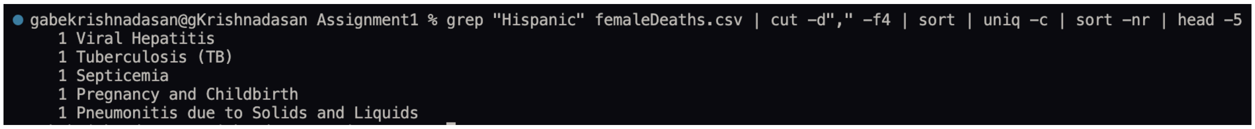
```
● gabekrishnadasan@gKrishnadasan Assignment1 % cut -d',' -f4 deaths.csv | sort | uniq -c | sort -nr
  11 Accidents Except Drug Poisoning
  10 Viral Hepatitis
  10 Septicemia
  10 Nephritis and Nephrotic Syndromes
  10 Mental and Behavioral Disorders due to use of or Accidental Poisoning by Psychoactive Substances Excluding Alcohol and Tobacco
  10 Malignant Neoplasms (cancer)
  10 Leukemia
  10 Intentional Self-Harm (Suicide)
  10 Influenza (Flu) and Pneumonia
  10 Essential Hypertension and Renal Diseases
  10 Diseases of Heart
  10 Diabetes Mellitus
  10 Chronic Lower Respiratory Diseases
  10 Certain Conditions Originating in the Perinatal Period
  10 Cerebrovascular Disease (stroke)
  10 Atherosclerosis
   9 Peptic Ulcer
   9 Parkinson's Disease
   9 Insitu or Benign / Uncertain Neoplasms
   9 Human Immunodeficiency Virus (HIV) Disease
   9 Chronic Liver Disease and Cirrhosis
   9 Assault (Homicide)
   9 Aortic Aneurysm and Dissection
   9 Alzheimer's Disease
   8 Tuberculosis (TB)
   8 Non-Hodgkins's Lymphoma
   8 Mental and Behavioral Disorders due to use of Alcohol
   8 Congenital Malformations and Chromosomal Abnormalities
   8 Complications of Medical and Surgical Care
   8 Cholelithiasis and Disorders of Gallbladder
   8 Anemias
   8 All Censored Causes
   7 Meningitis
   6 Pneumonitis due to Solids and Liquids
   5 Pregnancy and Childbirth
   5 Maternal Causes
   4 Legal Intervention
```

1) Used cut to get the cause of death column
2) Sorted the column to prepare for uniq
3) Used uniq to count
4) Sorted in reverse order



```
● gabekrishnadasan@gKrishnadasan Assignment1 % grep "Black,Male" deaths.csv > blackMaleDeaths.csv
● gabekrishnadasan@gKrishnadasan Assignment1 % cut -d',' -f4 blackMaleDeaths.csv | sort | uniq -c | sort -nr | head -3
   1 Viral Hepatitis
   1 Tuberculosis (TB)
   1 Septicemia
```

1) Used grep to get all data of black males
2) Redirected all the data into a new file named “blackMaleDeaths.csv”
3) Used cut on the new file to get all causes of death and piped to sort
4) Counted using uniq -c
5) Sorted in reverse order
6) Displayed top 3 causes using head -3 (Every cause of death for black males were different)



```
gabekrishnadasan@gKrishnadasan Assignment1 % grep "Hispanic" femaleDeaths.csv | cut -d"," -f4 | sort | uniq -c | sort -nr | head -5
   1 Viral Hepatitis
   1 Tuberculosis (TB)
   1 Septicemia
   1 Pregnancy and Childbirth
   1 Pneumonitis due to Solids and Liquids
```

1) Using the femaleDeaths.csv created earlier used grep to find all instances of Hispanic deaths
2) Used cut to get causes of death and sorted for uniq
3) Used uniq to count
4) Sorted in reverse order
5) Displayed top 5 causes using head -5

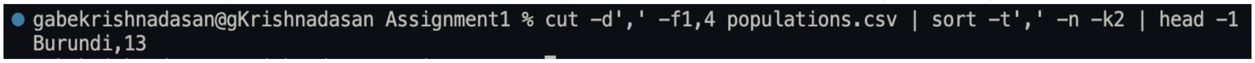
2. Obtained from UNICEF, the Exercise 2 Dataset (located in your assignment prompt in Canvas) contains data related to the population of 70+ countries for the year 2017.

   Dataset format: CSV

   Field names (in order): Country, Population, Urban Population, Percentage of Urban Population.

   Answer the following questions from this data using UNIX commands:

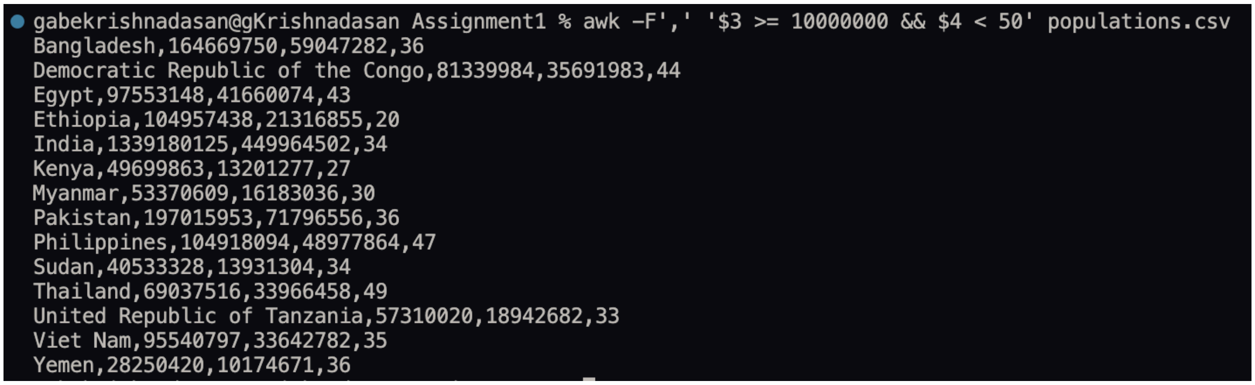
   2.1: Which country has the lowest percentage of urban population? (8 points)



```
gabekrishnadasan@gKrishnadasan Assignment1 % cut -d',' -f1,4 populations.csv | sort -t',' -n -k2 | head -1
Burundi,13
```

1) Used cut to get the country and urban population percent and piped into sort
2) Sorted the second column in order
3) Displayed the lowest percent using head -1

2.2: List the countries where the urban population is more than 10 million and yet they comprise less than half of the population. (10 points)



```
gabekrishnadasan@gKrishnadasan Assignment1 % awk -F',' '$3 >= 10000000 && $4 < 50' populations.csv
Bangladesh,164669750,59047282,36
Democratic Republic of the Congo,81339984,35691983,44
Egypt,97553148,41660074,43
Ethiopia,104957438,21316855,20
India,1339180125,449964502,34
Kenya,49699863,13201277,27
Myanmar,53370609,16183036,30
Pakistan,197015953,71796556,36
Philippines,104918094,48977864,47
Sudan,40533328,13931304,34
Thailand,69037516,33966458,49
United Republic of Tanzania,57310020,18942682,33
Viet Nam,95540797,33642782,35
Yemen,28250420,10174671,36
```

1) Used awk to print out all rows where the urban population was more than 10 million but comprised less than half the population

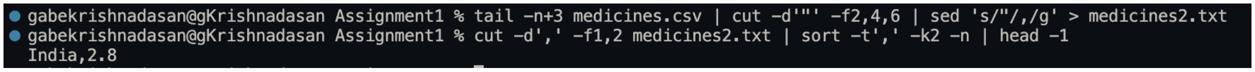
3. For the following exercise, use the Exercise 3 Dataset (located in your assignment prompt in Canvas), which contains the availability of essential medicines in 38 countries for the years 2007 - 2013, obtained from the World Health Organization (WHO).

   Dataset format: CSV

   Field names (in order): Country, Median availability of selected generic medicines (%) - Private, Median availability of selected generic medicines (%) - Public

   Answer the following questions from this data using UNIX commands:

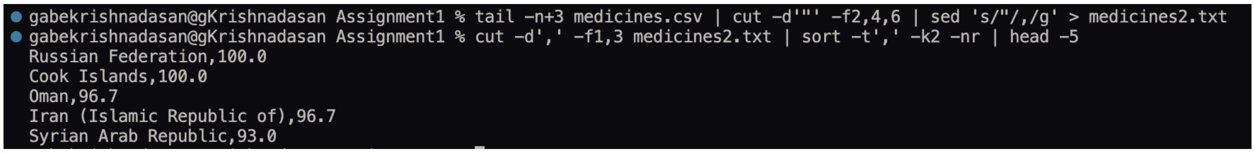
   3.1: Which country had the lowest percentage median availability of selected generic medicines in private. (8 points)



```
● gabekrishnadasan@gKrishnadasan Assignment1 % tail -n+3 medicines.csv | cut -d'"' -f2,4,6 | sed 's/"/,/g' > medicines2.txt
● gabekrishnadasan@gKrishnadasan Assignment1 % cut -d',' -f1,2 medicines2.txt | sort -t',' -k2 -n | head -1
  India,2.8
```

1) Used tail to remove the top two lines of the file
2) Used cut with a “ delimiter to get the three relevant columns
3) Used sed to replace the quotes with commas and redirected to a new file
4) Used cut on the new file to get the country and private percent
5) Sorted by private percent in order
6) Used head to get the lowest percent

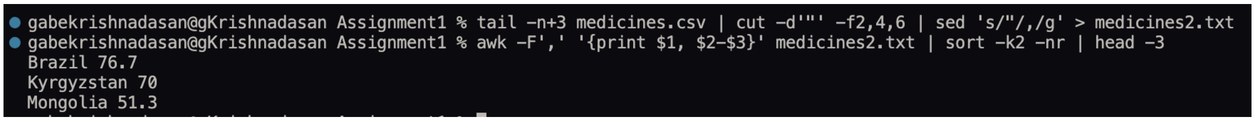
3.2: Top five countries with highest public percentage median availability of selected generic medicines. (8 points)



```
● gabekrishnadasan@gKrishnadasan Assignment1 % tail -n+3 medicines.csv | cut -d'"' -f2,4,6 | sed 's/"/,/g' > medicines2.txt
● gabekrishnadasan@gKrishnadasan Assignment1 % cut -d',' -f1,3 medicines2.txt | sort -t',' -k2 -nr | head -5
  Russian Federation,100.0
  Cook Islands,100.0
  Oman,96.7
  Iran (Islamic Republic of),96.7
  Syrian Arab Republic,93.0
```

1) Used same technique as above for first line
2) Used cut on the file to get the country and public percentage and piped to sort
3) Sorted the percentage in reverse order
4) Used head -5 to display the top five percentages

3.3: List the top three countries where it is best to rely on the private availability of selected generic medicines than public. Explain your answer with valid reasons. (10 points)



```
● gabekrishnadasan@gKrishnadasan Assignment1 % tail -n+3 medicines.csv | cut -d'"' -f2,4,6 | sed 's/"/,/g' > medicines2.txt
● gabekrishnadasan@gKrishnadasan Assignment1 % awk -F',' '{print $1, $2-$3}' medicines2.txt | sort -k2 -nr | head -3
  Brazil 76.7
  Kyrgyzstan 70
  Mongolia 51.3
```

1) Used same technique as above for first line
2) Used awk to print the country and then the difference between the private and public percentage, then piped to sort

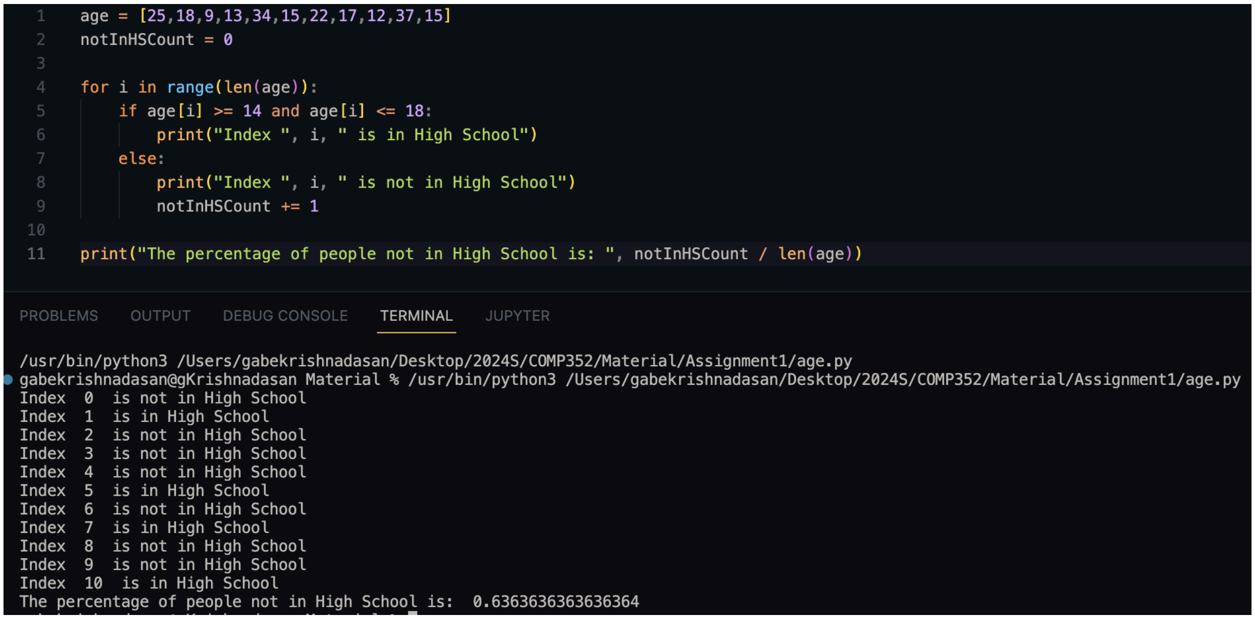
3) Sorted the difference in reverse order
4) Displayed the three greatest differences with head -3

My reason for these three countries is that the difference in the private and the public are the greatest, and it is best to rely on the private availability of medicines.

4. Write a Python script that assigns the list [25,18,9,13,34,15,22,17,12,37,15] to a variable "age" and uses that information to:

   4.1: Determine if a person is in high school or not. Assume that for a person to be in high school, their age should be between 14 and 18, inclusive. (5 points)

   4.2: From the list, calculate the percentage of people not going to high school. (5 points)



```
 1   age = [25,18,9,13,34,15,22,17,12,37,15]
 2   notInHSCount = 0
 3
 4   for i in range(len(age)):
 5       if age[i] >= 14 and age[i] <= 18:
 6           print("Index ", i, " is in High School")
 7       else:
 8           print("Index ", i, " is not in High School")
 9           notInHSCount += 1
10
11   print("The percentage of people not in High School is: ", notInHSCount / len(age))
```

```
/usr/bin/python3 /Users/gabekrishnadasan/Desktop/2024S/COMP352/Material/Assignment1/age.py
gabekrishnadasan@gKrishnadasan Material % /usr/bin/python3 /Users/gabekrishnadasan/Desktop/2024S/COMP352/Material/Assignment1/age.py
Index  0  is not in High School
Index  1  is in High School
Index  2  is not in High School
Index  3  is not in High School
Index  4  is not in High School
Index  5  is in High School
Index  6  is not in High School
Index  7  is in High School
Index  8  is not in High School
Index  9  is not in High School
Index  10  is in High School
The percentage of people not in High School is:  0.6363636363636364
```

1) Lines 1 and 2 are to set up variables
2) Lines 4-9 are a for loop that prints high school status and increments variable
3) Line 11 prints the percentage of non high school students