RINEX Observation Data File: Data record

```
                                                            END OF HEADER
> 2018 01 08 00 00 00.0000000  0 32
C05  39534144.396    39534140.214         -11.823          -9.114   205864665.89807 159187608.35007         44.650
C06  41055218.497    41055213.822        1639.188        1267.797   213785297.47906 165312341.39506         39.650
C09  41535936.487    41535934.476        2069.893        1600.579   216288522.22006 167247993.83206         39.150
C13  40126290.925    40126292.821       -1007.235        -778.666   208948130.50607 161571961.26706         44.500
E02  27369693.740    27369694.744    27369692.798    27369693.915        2738.490        2045.034        2098.487
E11  23471565.877    23471564.103    23471562.943    23471563.776        1451.433        1083.898        1112.161
E12  22725126.906    22725125.444    22725124.413    22725125.243       -1155.831        -863.056        -885.556
E18  16062458.842    16062465.008    16062463.520    16062464.464       -3697.971       -2761.459       -2833.484
E19  28139772.180    28139773.439    28139772.426    28139773.420        2411.143        1800.570        1847.878
E24  22528458.432    22528471.881    22528470.044    22528471.049       -2311.708       -1726.272       -1771.285
G05  24043448.517    24043447.558    24043447.453                       -1823.969       -1421.273       -1421.273
G16  22004021.207                    22004019.232                        2682.860                        2090.539
G18  23886756.683                    23886754.557                        3049.295                        2376.073
G20  22136803.636                    22136802.486                        1199.871                         934.966
G21  20991881.881                    20991879.730                         404.037                         314.834
G25  24549144.170    24549146.185    24549145.787    24549145.882       -3694.604       -2878.911       -2878.911
G26  20677748.179    20677749.481    20677749.779    20677747.379         935.468         728.936         728.936
G27  24073332.538    24073333.747    24073333.761    24073332.717        3180.256        2478.123        2478.123
G29  21988713.929    21988713.074    21988712.984                       -2543.361       -1981.841       -1981.841
G31  23336206.336    23336204.859    23336204.577                       -3115.513       -2427.673       -2427.673
R03  23724720.070    23724719.532    23724719.486       -2095.234       -1629.626       -1629.625   127000291.55607
R04  22430408.486    22430408.008    22430407.663        1280.390         995.858         995.859   120113841.63407
R05  23574745.635    23574746.817    23574746.653        3716.539        2890.642        2890.643   126020523.94906
R09  24041265.032    24041264.977    24041265.891       -4649.303       -3616.125       -3616.125   128379016.49607
R10  20201289.279    20201294.593    20201293.534       -2860.679       -2224.973       -2224.973   107684236.27508
R11  20272503.670    20272503.826    20272504.478        1578.015        1227.346        1227.346   108330102.19508
R12  23588075.720                                        4091.770                                    126003272.56907
R19  23179713.954    23179713.470    23179713.057       -3631.288       -2824.336       -2824.336   123995861.74507
R20  19662951.913    19662954.281    19662953.492       -1331.227       -1035.398       -1035.398   105146659.61807
R21  20590720.828    20590720.810    20590720.584        2292.972        1783.423        1783.423   110185113.30008
S20  38791228.785          94.336   203849271.48507          46.200
S23  38533561.173           2.696   202495695.07408          49.000
> 2018 01 08 00 00 30.0000000  0 33
C02  41195004.949    41195001.339         -12.769          -10.011   214513196.54215 165875198.92606         34.200
```

Epoch Record

```
                                                            END OF HEADER
> 2018 01 08 00 00 00.0000000  0 32
C05   39534144.396     39534140.214        -11.823          -9.114
C06   41055218.497     41055213.822       1639.188        1267.797
  :
  :
```

Record identifier

Epoch
year (4 digits)
month (2 digits)
day (2 digits)
hour (2 digits)
min (2 digits)
sec (F11.7)

epoch flag
0: OK
1: power failure between previous and current epoch
>1: special event

number of satellites observed in current epoch

Observation Records

```
                                                            END OF HEADER
> 2018 01 01 00 00 00.0000000  0 29
C02   41191991.728     41191986.407          -5.986          -4.081    214497507.15405
:
E02   24938165.728     24938166.900     24938165.526     24938166.185         1766.436
:
G05   23611704.155     23611702.947     23611702.772                          -746.731
:
R04   23178993.714     23178992.366     23178991.917          -691.038        -537.476
:
> 2018 01 01 00 00 30.0000000  0 29
C02   41192023.699     41192020.392          -6.010          -4.554
```

Satellite number

Format:
A1,I2.2

(1 character, 2 digit integer)

Observation Format: F14.3
(each type)

Observations
(number of types of observations taken from heading record: **SYS / # / OBS**)

Signal strength

Lost of Lock Indicator
0 or blank: OK or not known

Excercise 2

Prepare Matlab function for reading the data section of the RINEX observation file.
Only GPS data should be selected from the file

```
G_obs = Ex2_obsread_studentname
clc
obs_num = x;
fid= fopen('rinex_observation_filename');
      :
fclose(fid)
```

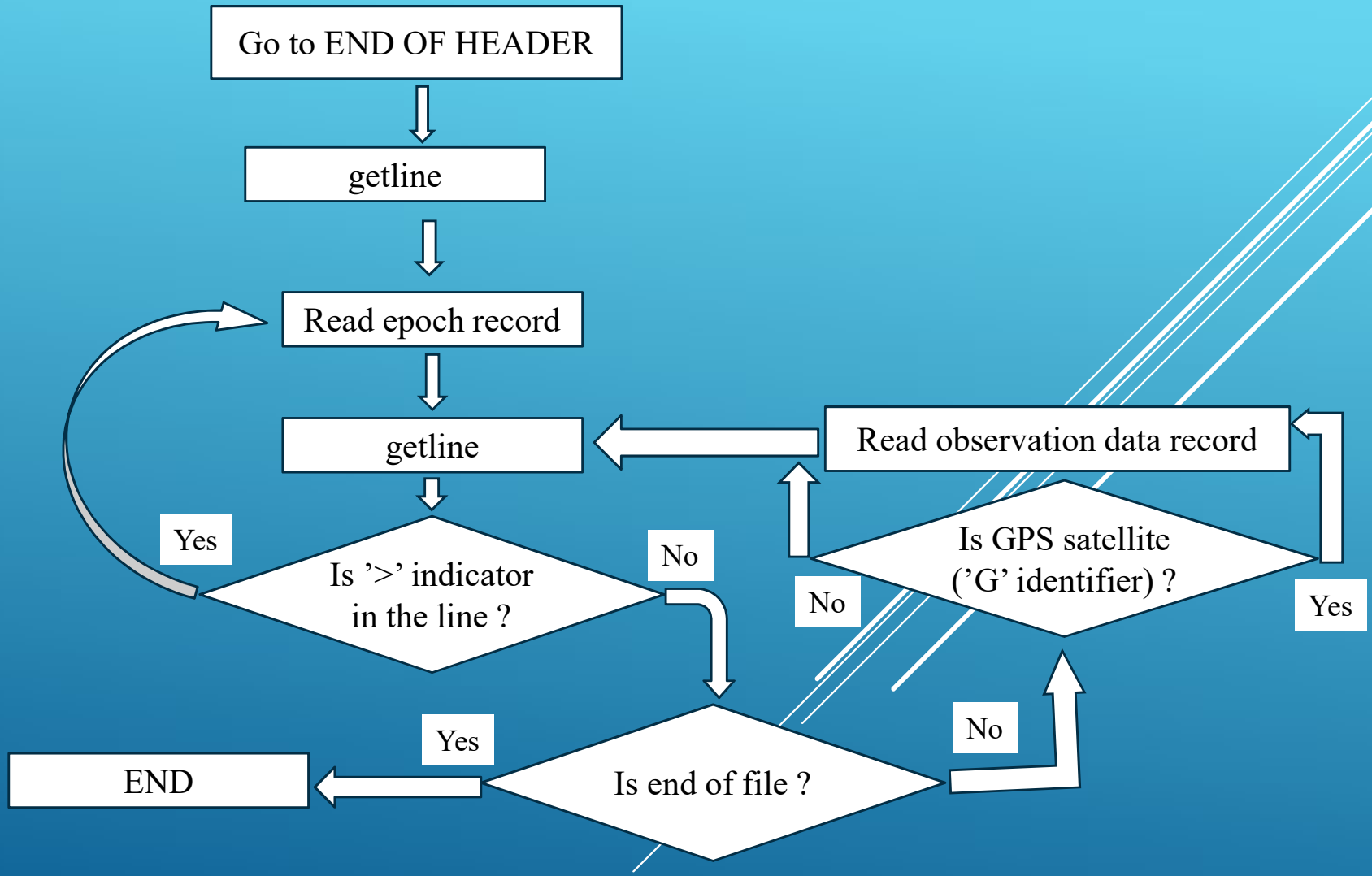
This function should be prepared individually by each student

The x value taken from function: **Ex1_headerread_studentname**

The results should be assigned to the cell variable G_obs:

G_obs{1,k} – k-th epoch as (1x6) row vector (year, month, day, hour, minute, second)

G_obs{2,k} – observation matrix on k-th epoch (matrix dimension: number_of_sat x obs_num)


Go to END OF HEADER
getline
Read epoch record
getline
Read observation data record
Is GPS satellite ('G' identifier) ?
Yes
No
Is '>' indicator in the line ?
Yes
No
Is end of file ?
Yes
No
END

Useful Matlab functions

fid = fopen(filename) – open file

fclose(fid) – close file

status = feof(fid) test for end of file (returns 1 if there is end)

line = fgetl(fid) – read line from file fid

b = strfind(line,str1) – find str1 within line

h = isempty(A) - determine whether array A is empty or not (1-empty, 0-not)

str1 = line(integer_vector) – ekstract str1 from line

str2num(str1) or str2double(str1) – convert string to number

break - terminate execution of *for* or *while* loop

while *expression*
statements
end

→ repeatedly executes *statements* as long as an *expression* remains true

if *expression*
statements
end

→ evaluates an *expression*, and executes a group of *statements* when the expression is true