exercise 1

```
clear
rng('default')
data(:,1) = randperm(300); % student numbers (1 to 300)
data(:,2) = randi(4,300,1) + 14; % class year (15 to 18)
data(:,3) = randi(20,300,1)/10 + 2; % GPA (2.0 to 4.0)
format short
checkvalues = mean(data)
```

```
checkvalues = 1×3
  150.5000   16.4533    2.9837
```

```
honorStudent = [];
honorGrad = [];
undergrad1Year = [];
undergrad2Year = [];
for iData = 1:size(data, 1)

    % 1. students with GPA 4.0
    if data(iData, 3) == 4
        honorStudent = [honorStudent ; data(iData, :)];
    end

    % 2. the seniors who will graduate with honors (GPA >= 3.5)
    if (data(iData, 2) == 15) && (data(iData, 3) >= 3.5)
        honorGrad = [honorGrad ; data(iData, :)];
    end

    % GPA of student #1
    if data(iData, 1) == 1
        studentNo1_GPA = data(iData, 3)
    end

    % first-year students
    if data(iData, 2) == 18
        undergrad1Year = [undergrad1Year ; data(iData, :)];
    end

    % second-year students
    if data(iData, 2) == 17
       undergrad2Year = [undergrad2Year ; data(iData, :)];
    end

end
```

```
studentNo1_GPA = 2.9000
```

```
% 3. the number of GPA 3.0 or higher in first-year students
majorPsychology = sum(undergrad1Year(:, 3) >= 3)
```

```
majorPsychology = 28
```

```
% 4. standard deviation of the GPAs of second-year students
std_undergrad2Year = std(undergrad2Year(:,3))
```

```
std_undergrad2Year = 0.5818
```

exercise 2

write and save data in text file

```
fid = fopen('studentGPA.txt', 'wt');

% from exercise 1, students with GPA 4.0
fprintf(fid, "Students with GPA 4.0\n\n");
fprintf(fid, "%-4s%-4s%-4s\n\n","ID", "Yr", "GPA");
for i = 1:size(honorStudent, 1)
    fprintf(fid, "%-4d%-4d%-4.1f\n", honorStudent(i,:));
end

% from exercise 1, the seniors who will graduate with honors
fprintf(fid, "\nThe seniors who will graduate with honors\n\n");
fprintf(fid, "%-4s%-4s%-4s\n\n","ID", "Yr", "GPA");
for i = 1:size(honorGrad, 1)
    fprintf(fid, "%-4d%-4d%-4.1f\n", honorGrad(i,:));
end

% from exercise 1, first-year students who are likely to elect to be Psychology majors
fprintf(fid, "\nFirst-year students who are likely to elect to be Psychology majors\n");
fprintf(fid, "Total : %d students\n\n",majorPsychology);
fprintf(fid, "%-4s%-4s%-4s\n\n","ID", "Yr", "GPA");
for i = 1:size(undergrad1Year, 1)
    if undergrad1Year(i, 3) >= 3
        fprintf(fid, "%-4d%-4d%-4.1f\n", undergrad1Year(i,:));
    end
end

fclose(fid);
type('studentGPA.txt');
```

```
Students with GPA 4.0

ID  Yr  GPA

40  18  4.0
34  17  4.0
160 17  4.0
232 18  4.0
259 17  4.0
202 18  4.0
56  16  4.0
298 17  4.0
73  15  4.0
```