

SCHOOL OF CHEMICAL AND ENERGY ENGINEERING  
UNIVERSITI TEKNOLOGI MALAYSIA

SCSJ 2273 PROGRAMMING FOR ENGINEERS  
Project 2

Semester II 2019-2020  
Due: 1<sup>st</sup> June 2020

This is NOT a group project. While discussion with other students is encouraged, all work submitted for credit, however, must be your own. Any evidence of plagiarism or other forms of scholastic dishonesty will be grounds for a failing grade in the course.

**Problem Statement**

The following data are obtained from the file JBWEA.DAT . It contains the hourly average air temperatures for the months of January through December, recorded at Senai airport:

Hour	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	23.0	22.7	23.7	23.9	24.1	24.9	23.9	23.7	23.9	23.9	24.2	23.7
2	22.9	22.4	23.4	23.8	23.9	24.7	23.7	23.5	23.7	23.7	24.1	23.5
3	22.8	22.2	23.3	23.6	23.7	24.5	23.4	23.3	23.5	23.6	23.9	23.5
4	22.6	22.0	23.0	23.5	23.5	24.3	23.2	23.1	23.3	23.4	23.7	23.4
5	22.5	21.8	22.9	23.3	23.4	24.2	23.0	23.0	23.2	23.3	23.6	23.3
6	22.5	21.6	22.7	23.2	23.3	24.0	23.0	22.9	23.1	23.1	23.5	23.3
7	22.6	21.9	23.2	23.8	24.1	24.6	23.5	23.3	23.6	23.9	24.3	23.9
8	24.1	24.3	25.4	26.0	26.3	26.8	25.5	25.2	25.5	26.3	26.1	25.3
9	25.7	27.0	28.1	28.5	28.6	28.8	27.8	27.7	27.9	28.8	28.1	27.2
10	26.6	28.9	29.7	30.0	29.9	30.2	29.2	29.0	29.5	30.1	29.2	28.2
11	27.5	30.1	30.7	31.1	30.5	31.1	29.6	29.3	30.1	30.7	30.0	29.0
12	27.9	31.0	31.4	31.3	30.4	31.3	30.0	29.7	30.3	30.6	30.5	29.7
13	27.9	31.6	32.0	31.3	30.2	31.3	30.2	29.5	29.8	29.7	30.4	29.7
14	27.9	31.9	31.4	30.7	29.3	31.0	29.6	28.7	29.7	29.2	30.5	29.1
15	27.7	31.7	29.6	29.9	29.1	30.6	29.0	28.2	29.4	28.7	29.7	28.6
16	27.3	31.0	28.9	28.5	28.5	30.1	28.7	27.9	28.7	27.7	29.1	28.5
17	26.7	29.3	28.0	27.4	27.8	29.2	28.2	27.3	27.9	26.9	28.2	27.4
18	25.8	27.7	27.1	26.5	26.9	28.3	27.5	26.7	27.1	26.2	27.1	26.4
19	25.0	26.4	26.2	25.8	26.2	27.4	26.5	25.8	26.1	25.6	26.3	25.6
20	24.5	25.4	25.7	25.3	25.6	26.7	25.8	25.2	25.5	25.2	25.7	25.0
21	24.1	24.6	25.2	24.9	25.3	26.3	25.2	24.8	25.1	24.8	25.3	24.6
22	23.7	24.0	24.7	24.6	24.9	25.8	24.8	24.5	24.7	24.5	25.1	24.4
23	23.4	23.5	24.4	24.3	24.6	25.5	24.4	24.2	24.3	24.3	24.8	24.1
24	23.2	23.0	24.0	24.1	24.4	25.1	24.1	24.0	24.1	24.1	24.5	23.9

Note: Hour 1= 1AM, 2= 2AM,....., 24= midnight.

Download JBWEA.DAT from our class website at my homepage.

Delete the first row and save it as: `suhu.txt`

Write a MATLAB/Octave program that reads the data from the file '`suhu.txt`' and write the following outputs to an output file named '`suhu.out`'.

- (a) Monthly minimum air temperatures, and their time of occurrence.
- (b) Monthly maximum air temperatures, and their time of occurrence.
- (c) Average monthly air temperatures.
- (d) The number of hours the air temperature is above 26°C.
- (e) The number of hours the air temperature is below 24°C.

- Submit the input data, the MATLAB/Octave source codes and the results printed from the output file – `suhu.out`.
- Submit a plot of air temperature vs time for the months of January, June and December as three separate plots. The codings must appear in the script file.

### **Project report submission**

1. This project report must be presented in a standard technical report format. The content must include introduction, flowchart, results (program output) and discussion including program verification, and conclusion.
2. Fully commented source codes of the computer programs developed for the project must also be handed in. No mark will be given if the program softcopy is not submitted.
3. Report, code and relevant files must be zipped into a single file and submitted by email to me at `mohsin@utm.my`
4. Please include the following statement in the first page of the project submission. No mark will be given if this statement is not included.

I, *full name*, hereby declare that this project submission is a product of my own effort. I acknowledge that academic disciplinary action can be taken if this submission is a result of plagiarism or other form of scholastic dishonesty.

Yours Truly,

*Your signature and date*