**IE-341**

**Section 1, CRN: 30512/513/514**

**Section 2, CRN: 30515/516/517**

**Section 3, CRN: 46950/951/952**

**First Semester 1435-36 H (Fall-2014) – 3(2,1,2)
“HUMAN FACTORS ENGINEERING**

**Sunday, Nov. 09, 2014 (16/01/1436H)**

**Homework 2**

|  |  |  |
| --- | --- | --- |
| **Name:**  | **Student Number:****4** | **Section:****Sun / Mon / Wed** |

**Answer ALL of the following questions.**

1. Compare **three** industrial products to their ergonomic versions. You are also requested to highlight the main feature(s) that distinguish the ergonomic product. An example that was mentioned in class is displayed below. [*3 points*]

|  |  |
| --- | --- |
| **Traditional vinyl eraser** (not the best choice for precision erasing) | **Ergonomic eraser**: easier grip |

Note, you can earn **extra credit** by suggesting additional ergonomic design features to each example.

1. The data shown below is a list of all the grades (out of 10) acquired in the first midterm for one of the IE-341 sections. [*3.5 points*]

 **4.5 7.5 8.5 6.0 9.0 10.0 7.5 8.0 8.0 7.5 7.0
 7.0 5.0 7.5 7.5 8.5 9.0 9.0 8.0 9.5 5.0**

 Use Microsoft Excel to:

1. Sort the data (from largest to smallest).
2. Find the number of data points, $n$.
3. Find the minimum and maximum grades.
4. Find the median and average grades.
5. Find the standard deviation.
6. Find the 5th, 25th, 40th, 50th, 60th, 75th, and 95th percentiles (Note, you may use the attached .pdf file to help you calculate the percentiles using the interpolation method).
7. Plot your data on a graph of your choice.
8. The following is an exercise aimed at performing a sample redundancy comparison between the English and Arabic languages. An entire e-book is attached in each language. For each book (use the first 100 pages of each) you are requested to use both MS Word and MS Excel to perform the following: [*3.5 points*]
9. Find the recurrence for each letter of the alphabet in each book, i.e. a/A – z/Z for the English book and ا\أ-ي in the Arabic book. Be careful to consider each variation of a certain letter as a separate letter (e.g. ي ى ئ can be considered 3 different letters).
10. Find the total number of letters in each book.
11. Calculate the maximum amount of information ($H\_{max}$) that can be achieved by each letter set (i.e. alphabet).
12. Find the probability ($p\_{i}$) of occurrence of each letter.
13. Calculate the average amount of information ($H\_{ave}$) for each book using d) above.
14. Calculate the redundancy percentage using c) and e) for each book.
15. Compare these results (in your own way) to those previously discussed in class.
16. You can earn **extra credit** for comparing these figures to the text of the Holy Qur’an (also first 100 pages).

**Rules:**

* You must prepare and submit the homework **individually**.
* All work must be neatly typed and printed.
* Use **proper English**.
* Show all work.
* **BOX** your answer(s) and include the **units** (if applicable).
* **Due date**: the last class of Week 10 (beginning of class). NO late homework will be accepted.