

**Key there seems to be a 'bug' or 'undesired result' when using source("r.txt") on linux and mac. Some of the data seems to be ignored, ie question 8 append your data to the table. Runs grand when you step through it, but 'leaving it go' does not get the intended result!**

## Q1 , Q2 ( R CODE)

### Q3

|                   |                |         |       |
|-------------------|----------------|---------|-------|
| 57 Males          | 35 Females     |         |       |
| 37 Ran            | 57 did not run |         |       |
| 28 smokers        | 64 non smokers |         |       |
| 9 Slight activity | 61 moderate    | 21 high | 1 N/A |

The problem is the statistics for the activity differ from that of the amount of people because of the N/A. This will affect the Pulse data and our analysis of this data. They're will be a +/- 1.08% margin of error in the test data related to activity.

### Q4

30.43 % smoke  
 69.57 % non smokers  
 35.08 % males smoke  
 22.85 % females smoke  
 28.07 % males high level of activity  
 14.28 % females high level activity

### Q5

In the **stem & leaf** diagram we can see that the smallest person is 1.549 metres tall the tallest persons (3) are 1.905 metres tall, stem is very accurate at showing data for each frequency interval but does not indicate mean, median, quartiles etc.

In the **histogram** we can see frequency of a particular heights and the distribution.

It is difficult to work out the mean, median and quartiles from this graph.

But we can see a kurtosis indicating between 1.65 and 1.85 metres is good indication of a mean range. The shortest person is indicated to be around 1.5 to 1.6 metres. The tallest over 1.9.

In the **box plot** we can see the median of 1.75 metres. The box itself indicates the inter quartile or 50% of the data. 50% of people are between 1.68 and 1.83 metres. The upper quartile is rather small compared to the lower quartile indicating that it is a slightly positively skewed distribution.

Although the median is equidistant telling is that it is bell shaped symmetric in the inter quartile.

We can also see a smallest height of around 1.55 and a max height of 1.9x.

The mean is not evident.

## Diagram Analysis

The **Box plot** indicates frequency distribution, median, quartiles, smallest and highest intervals than the other graphs making it the *most informative daigram*.

The **stem** diagram although is very accurate at telling us how many people and their heights at each interval, but in statistics we are interested in quartiles and frequency distribution.

The **histogram** is the least usefull, we can't get an acurrate distribution, mean, median, quartiles, high or lowest heights, the only thing is is good for is frequency in this case.

## Q6

| Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |
|------|---------|--------|------|---------|------|
|------|---------|--------|------|---------|------|

### Pulse 1 Statistics

|       |       |       |       |       |        |
|-------|-------|-------|-------|-------|--------|
| 48.00 | 64.00 | 71.00 | 72.87 | 80.00 | 100.00 |
|-------|-------|-------|-------|-------|--------|

### Female statistics

|       |       |       |       |       |        |
|-------|-------|-------|-------|-------|--------|
| 58.00 | 67.00 | 78.00 | 76.86 | 85.00 | 100.00 |
|-------|-------|-------|-------|-------|--------|

### Male statistics

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 48.00 | 64.00 | 70.00 | 70.42 | 74.00 | 92.00 |
|-------|-------|-------|-------|-------|-------|

The males are more relaxed and are fitter as seen in the statistics.

The women have higher BPM overall in all stats.

This in conjunction with males being twice as active as the females statistically, is conducive to this analysis.

| Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |
|------|---------|--------|------|---------|------|
|------|---------|--------|------|---------|------|

### Pulse 2 Statistics

|    |    |    |    |    |     |
|----|----|----|----|----|-----|
| 50 | 68 | 76 | 80 | 85 | 140 |
|----|----|----|----|----|-----|

### Pulse 2 statistics (not ran)

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 50.00 | 66.00 | 70.00 | 72.32 | 78.00 | 94.00 |
|-------|-------|-------|-------|-------|-------|

### Pulse 2 statistics (ran)

|       |       |       |       |        |        |
|-------|-------|-------|-------|--------|--------|
| 58.00 | 76.00 | 88.00 | 92.51 | 105.00 | 140.00 |
|-------|-------|-------|-------|--------|--------|

### Pulse 2 statistics (Female Ran)

|      |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|
| 98.0 | 102.0 | 112.0 | 112.8 | 117.0 | 140.0 |
|------|-------|-------|-------|-------|-------|

### Pulse 2 statistics (Female Not Ran)

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 56.00 | 68.00 | 75.00 | 74.75 | 80.00 | 92.00 |
|-------|-------|-------|-------|-------|-------|

### Pulse 2 statistics (Male Ran)

|       |       |       |       |       |        |
|-------|-------|-------|-------|-------|--------|
| 58.00 | 76.00 | 80.00 | 83.21 | 89.50 | 118.00 |
|-------|-------|-------|-------|-------|--------|

### Pulse 2 statistics (Male Not Ran)

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 50.00 | 64.00 | 70.00 | 70.55 | 76.00 | 94.00 |
|-------|-------|-------|-------|-------|-------|

## Female to Male BPM relationship

| Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |
|------|---------|--------|------|---------|------|
|------|---------|--------|------|---------|------|

|     |       |       |       |       |       |
|-----|-------|-------|-------|-------|-------|
| 41% | 25.5% | 29.6% | 26.3% | 23.5% | 15.8% |
|-----|-------|-------|-------|-------|-------|

After the test we can see the difference between male and female BPM.

Male BPM is on average 26.3% less compared to there female counterparts.

### Q7

| Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |
|------|---------|--------|------|---------|------|
|------|---------|--------|------|---------|------|

#### *BMI statistics*

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 16.73 | 20.00 | 21.42 | 21.50 | 22.83 | 29.15 |
|-------|-------|-------|-------|-------|-------|

#### *BMI Females*

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 16.73 | 19.48 | 20.18 | 20.36 | 21.42 | 26.47 |
|-------|-------|-------|-------|-------|-------|

#### *BMI Males*

|       |       |       |       |       |       |
|-------|-------|-------|-------|-------|-------|
| 18.65 | 20.53 | 22.05 | 22.20 | 23.57 | 29.15 |
|-------|-------|-------|-------|-------|-------|

Males have a higher percentage body mass index related to the higher level of activity.

### Q8

| Min. | 1st Qu. | Median | Mean | 3rd Qu. | Max. |
|------|---------|--------|------|---------|------|
|------|---------|--------|------|---------|------|

#### *People Who did not run*

|     |    |   |       |   |    |
|-----|----|---|-------|---|----|
| -14 | -2 | 0 | -0.10 | 2 | 10 |
|-----|----|---|-------|---|----|

#### *People Who Ran*

|    |   |    |       |    |    |
|----|---|----|-------|----|----|
| -8 | 8 | 16 | 18.91 | 31 | 48 |
|----|---|----|-------|----|----|

As we would expect there was little or no change in the mean BPM for people who did not run.

People who ran hower had a mean increase of 18.9 BPM.

### Q9 (R Code)

### Q10

The higher level of activity is directly related to the body mass index.

A higher level of activity is directly related to a lower pulse rate.

Woman are statistically less active than men and this is directly related to a higher BPM.

High activity smokers compared to non smokers, Mean increase of 2 BPM / 5 BPM.

Medium activity smokers compared to non smokers, Mean increase of 21 BPM / 25 BPM.

Slight activity smokers compared to non smokers, Mean increase of 8 BPM / 10 BPM.

Non smokers have a higher increase in heart rate during the running activity,

Categorically and overall. Mean increase 14 / 21 BPM repectively.