## Statistics for Engineers Lab assessment – 2

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## 19MID0020

1. Write R code to compute mean, median, mode and all measures of dispersions for the following frequency distribution:

Expenditure	0-100	100-200	200-300	300-400	400-500	500-600	600-700
No. of families	10	6	9	16	4	24	27

Also calculate (i) Mean Deviation about mean (ii) Mean Deviation about median (iii) Mean Deviation about mode

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 Run Source •
    1 x1 = c(0,100,200,300,400,500,600)
      freq = c(10,6,9,16,4,24,27)
      xu = c(100, 200, 300, 400, 500, 600, 700)
       mid = (x1+xu)/2 # Mid value of x1
      # Mean
    7
      Ef
           = sum(freq)
      Efx = freq*mid
    9 mean = sum(Efx/Ef)
      cat("Mean : ",mean)
   10
   11
      ## Median
   12
   13
       cf = cumsum(freq)
       median_class = min(which(cf>N/2))
   14
   15
       Lower_limit = xl[median_class]
   16
      m = cf[median\_class-1]
   17
      c = x1[2]-x1[1]
      f = freq[median_class]
      median = Lower_limit + ((sum(freq)/2-m)/f)*c
      cat("Median : ",median)
   20
   21
  63:25
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   20 cat("Median: ",median)
       21
       22
              # Mode
      23
             mode = (3*median) - (2*mean)
      24
      25
             Mean_deviation_about_mean = sum(freq*abs(mid-mean))/sum(freq)
             cat("Mean deviation about mean : ",Mean_deviation_about_mean)
      26
      27
           Mean_deviation_about_median = sum(freq*abs(mid-median))/sum(freq)
      28
             cat('Mean deviation about median : ',Mean_deviation_about_median)
      29
      30
       31 Mean_deviation_about_mode = sum(freq*abs(mid-mode))/sum(freq)
       32
            cat('Mean deviation about mode : ',Mean_deviation_about_mode)
       33
             cat('Coefficient of Mean deviation about mean/mean
                                                                                                                      : ',Mean_deviat
             cat('Coefficient of Mean deviation about median/median : ',Mean_deviat
                                                                                                                      : ',Mean_deviat
             cat('Coefficient of Mean deviation about mode/mode
       37
       38
             ## Quartile deviation
       39
            q1 = min(which(cf>sum(freq)/4))
      40
     21:1
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   35 cat('Coefficient of Mean deviation about median/median : ',Mean_deviat^
       36 cat('Coefficient of Mean deviation about mode/mode : ',Mean_deviat
       37
       38 ## Quartile deviation
             q1 = min(which(cf>sum(freq)/4))
       39
      40 fq1 = freq[q1]
      41 cfl = cf[ql-1]
             1 = mid[q1]-c/2
      42
             quart = 1+((sum(freq)/4 - cf1)/fq1)*c
      43
             q3 = min(which(cf>3*sum(freq)/4))
            fq3 = freq[q3]
      45
      46
             cf2 = cf[q3-1]
      47
             1 = mid[q3]-c/2
             quart3 = 1+(((3*sum(freq)/4)-cf2)/fq3)*c
      48
       49
             qd = (quart3-quart)/2
             cat('1st quartile : ',quart)
cat('3rd quartile : ',quart3
       50
                                                        ,quart3)
       51
             cat('Quartile deviation : ',qd)
       52
       53
       54
             coefficient_quartile_deviation = (quart3-quart)/(quart3+quart)
       55
      21:1
             (Top Level) $
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   48 quart3 = 1+(((3*sum(freq)/4)-cf2)/fq3)*c
       qd = (quart3-quart)/2
       cat('1st quartile : ',quart)
cat('3rd quartile : ',quart3
                              ,quart3)
       cat('Quartile deviation : ',qd)
   53
   54
       coefficient_quartile_deviation = (quart3-quart)/(quart3+quart)
   55
       cat('Coefficient of quartile deviation : ',coefficient_quartile_deviat
   56
   57
       a = c(mid-mean)
       b = a \wedge 2
   58
       F = freq*b
   59
   60
       c = sum(F)
       d = c/sum(freq)
   61
   62
       e = sqrt(d)
       cat('Standard deviation : ',e)
   63
   64
   65
   66
   67
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 Mean: 435.4167>
  > ## Median
  > cf = cumsum(freq)
  > median_class = min(which(cf>N/2))
  > Lower_limit = xl[median_class]
 > m = cf[median_class-1]
 > c = x1[2]-x1[1]
  > f = freq[median_class]
  > median = Lower_limit + ((sum(freq)/2-m)/f)*c
  > cat("Median : ",median)
  Median : 512.5>
 > # Mode
  > mode = (3*median) - (2*mean)
 > Mean_deviation_about_mean = sum(freq*abs(mid-mean))/sum(freq)
> cat("Mean deviation about mean : ",Mean_deviation_about_mean)
 Mean deviation about mean: 179.2101>
 > Mean_deviation_about_median = sum(freq*abs(mid-median))/sum(freq)
> cat('Mean deviation about median : ',Mean_deviation_about_median)
 Mean deviation about median : 173.1771>
 > Mean_deviation_about_mode = sum(freq*abs(mid-mode))/sum(freq)
> cat('Mean_deviation_about_mode): ',Mean_deviation_about_mode)
 Mean deviation about mode: 231.25>
```

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  > cat('Coefficient of Mean deviation about mean/mean
                                                                    ',Mean_deviation_about_mean/mean)
 Coefficient of Mean deviation about mean/mean : ian/median : ',Mean_deviation_about_median/median)
                                                          : 0.4115829> cat('Coefficient of Mean deviation about med
 Coefficient of Mean deviation about median/median: 0.3379065> cat('Coefficient of Mean deviation about mod
                  ,Mean_deviation_about_mode/mode)
 Coefficient of Mean deviation about mode/mode
                                                          : 0.346875>
 > ## Ouartile deviation
 > q1 = min(which(cf>sum(freq)/4))
 > fql = freq[ql]
 > cfl = cf[ql-1]
> l = mid[q1]-c/2
 > quart = 1+((sum(freq)/4 - cf1)/fq1)*c
 > q3 = min(which(cf>3*sum(freq)/4))
 > fq3 = freq[q3]
 > cf2 = cf[q3-1]
       = mid[q3]-c/2
 > quart3 = 1+(((3*sum(freq)/4)-cf2)/fq3)*c
 > qd = (quart3-quart)/2
> cat('1st_quartile : ',quart)
 1st quartile : 288.8889> cat('3rd quartile : ',quart3)
3rd quartile : 611.1111> cat('Quartile deviation : ',q
 Quartile deviation : 161.1111>
 > coefficient_quartile_deviation = (quart3-quart)/(quart3+quart)
RStudio
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   F:/2) Second Year 2020-2021/Fall semester 2020-2021/MAT2001 Statistics for Engineers/Assignment/
  > q3 = min(which(cf>3*sum(freq)/4))
  > fq3 = freq[q3]
  > cf2 = cf[q3-1]
           = mid[q3]-c/2
  > quart3 = 1+(((3*sum(freq)/4)-cf2)/fq3)*c
  > qd = (quart3-quart)/2
  > cat('1st quartile : ',quart)
  1st quartile : 288.8889> cat('3rd quartile : ',quart3)
  3rd quartile : 611.1111> cat('Quartile deviation : ',qd)
  Quartile deviation: 161.1111>
  > coefficient_quartile_deviation = (quart3-quart)/(quart3+quart)
  > cat('Coefficient of quartile deviation : ',coefficient_quartile_deviation)
  Coefficient of quartile deviation: 0.3580247>
  > a = c(mid-mean)
    b
         = a^2
         = freq*b
     c = sum(F)
     d = c/sum(freq)
     e = sqrt(d)
    cat('Standard deviation : ',e)
  Standard deviation: 203.0903
  > |
```