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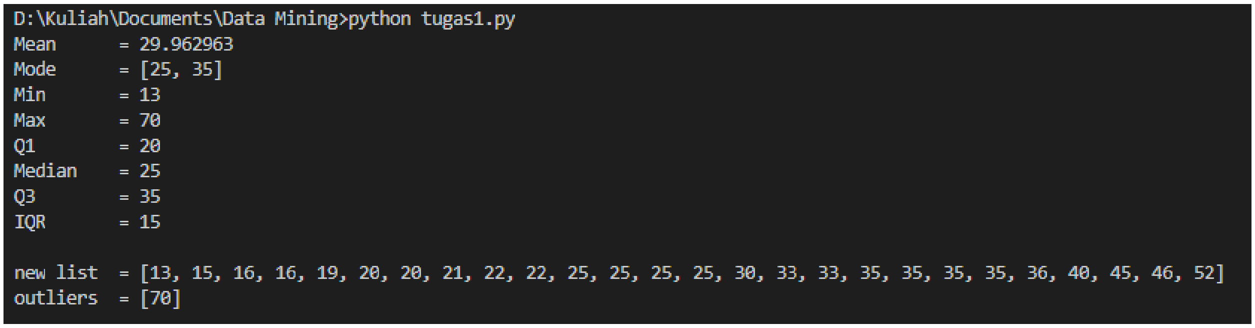
Kelas : Data Mining – C

Given an age data : 13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70

A. Write a program (without any libraries) that computes
   1. Mean
   2. Mode
   3. Five-number summary
   4. Detect outliers using IQR. Do outliers exist?

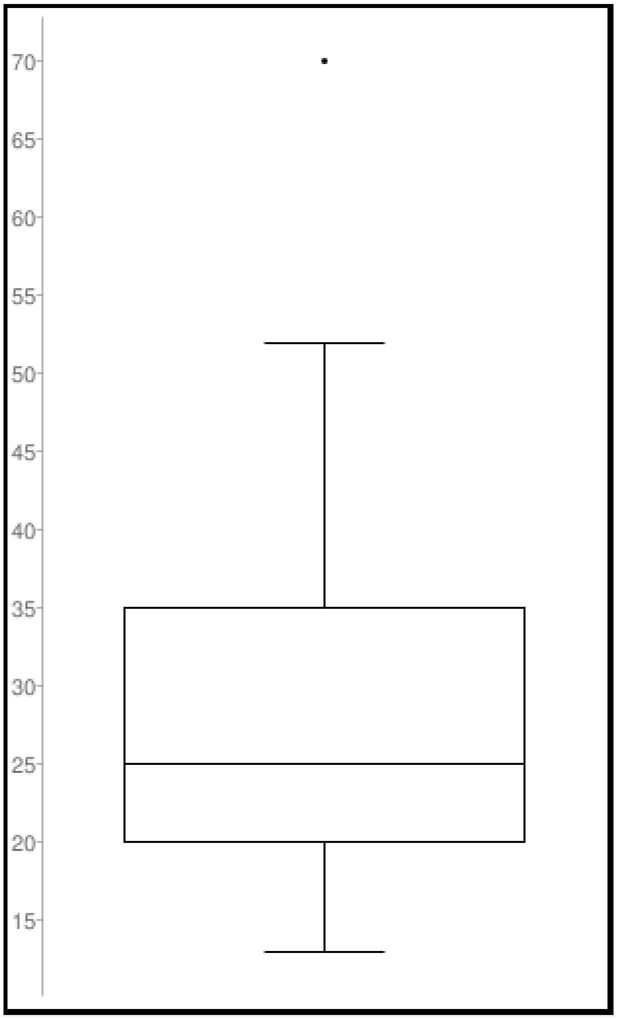
Source Code

```
ageList = [13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52, 70]
ageListLength = len(ageList)

#Mean
def mean(listNum, listLen):
   totalNumber = sum(listNum)
   mean = totalNumber/listLen
   print("%-10s= %f" %("Mean", mean))

#Mode
def mode(listNum):
   modeNum = 0
   listMode = []
   for num in listNum:
      if num in listMode:
         continue
      counter = listNum.count(num)
      if counter > modeNum:
         del listMode[:]
         listMode.append(num)
         modeNum = counter
      elif counter == modeNum:
         listMode.append(num)
   print("%-10s= %s" %("Mode", str(listMode)))

# Index of the median
def Qindex(listNum, l, r):
   n = r - l + 1
   n = (n + 1) // 2 - 1
   return n + l

#Maximum and Minimum Value
def maxminVal(listNum, a):
   if a=="min":
      minimum = listNum[0]
      for num in listNum:
         if num < minimum:
            minimum = num
      return minimum
   if a=="max":
      maximum = listNum[0]
      for num in listNum:
         if num > maximum:
            maximum = num
      return maximum

#Five Number Summary
def fiveNumSummary(listNum, listLen):
   # listNum = listNum.sort()

   #middle index
   mid_index = Qindex(listNum, 0, listLen)

   Q1 = listNum[Qindex(listNum, 0, mid_index)]
   median = listNum[(Qindex(listNum, 0, listLen))]
   Q3 = listNum[Qindex(listNum, mid_index + 1, listLen)]
   print("%-10s= %d" %("Min", maxminVal(listNum,"min")))
   print("%-10s= %d" %("Max", maxminVal(listNum,"max")))
   print("%-10s= %d" %("Q1", Q1))
   print("%-10s= %d" %("Median", median))
   print("%-10s= %d" %("Q3", Q3))

#Outlier - IQR
def outIQR(listNum, listLen):
   mid_index = Qindex(listNum, 0, listLen)
   Q1 = listNum[Qindex(listNum, 0, mid_index)]
   Q3 = listNum[Qindex(listNum, mid_index + 1, listLen)]
   IQR = Q3 - Q1
   lowerBound = Q1 - 1.5*IQR
   upperBound = Q3 + 1.5*IQR

   #list without outliers
   newList = []

   #list of outliers
   outliers = []

   for num in listNum:
      if num>lowerBound and num<upperBound:
         newList.append(num)
      else:
         outliers.append(num)
   print("%-10s= %d" %("IQR", IQR))
   print("\nnew list  = " + str(newList))
   print("outliers  = " + str(outliers))

mean(ageList, ageListLength)
mode(ageList)
fiveNumSummary(ageList, ageListLength)
outIQR(ageList, ageListLength)
```



```
D:\Kuliah\Documents\Data Mining>python tugas1.py
Mean      = 29.962963
Mode      = [25, 35]
Min       = 13
Max       = 70
Q1        = 20
Median    = 25
Q3        = 35
IQR       = 15

new list  = [13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 45, 46, 52]
outliers  = [70]
```

B. Draw a boxplot describing the five-number summary of the data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