[Tugas Metstat Responsi 05 P11]

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Kode R dapat diakses pada :

https://bit.ly/3LVhwC0

[Latihan 1]

Wackerly, *et al.*, 2008

4.45 Upon studying low bids for shipping contracts, a microcomputer manufacturing company finds that intrastate contracts have low bids that are uniformly distributed between 20 and 25, in units of thousands of dollars. Find the probability that the low bid on the next intrastate shipping contract

a is below \$22,000.

b is in excess of \$24,000.

Jawab :

Code

Res5.r M ×

R > Metstat > Tugas Metstat Responsi 05 > Res5.r > ! [LATIHAN 1]

You, 15 minutes ago | 1 author (You)

```r
#? TUGAS Mestat Responsi 05 P11

#* NAMA : Angga Fathan Rofiqy
#* NIM  : G1401211006

#! [ LATIHAN 1 ] ==============================================================
#! (4.45) Wackerly, et al., 2008

#! Question :
#! a). P(X<22000)?
cat("  P(X<22000)=", punif(22000, min = 20000, max = 25000))

#! b). P(X>24000)?
cat("  P(X>24000)=", punif(24000, min = 20000, max = 25000, lower.tail = FALSE))
#!===========================================================================
```

Output :

```
> #? TUGAS Mestat Responsi 05 P11
>
> #* NAMA : Angga Fathan Rofiqy
> #* NIM  : G1401211006
>
> #! [ LATIHAN 1 ] ==============================================================
> #! (4.45) Wackerly, et al., 2008
>
> #! Question :
> #! a). P(X<22000)?
> cat("  P(X<22000)=", punif(22000, min = 20000, max = 25000))
  P(X<22000)= 0.4>
> #! b). P(X>24000)?
> cat("  P(X>24000)=", punif(24000, min = 20000, max = 25000, lower.tail = FALSE))
  P(X>24000)= 0.2> #!===========================================================================
```

[Latihan 2]

Wackerly, *et al.*, 2008

4.51 The cycle time for trucks hauling concrete to a highway construction site is uniformly distributed over the interval 50 to 70 minutes. What is the probability that the cycle time exceeds 65 minutes if it is known that the cycle time exceeds 55 minutes?

Jawab :
Code

Res5.r M ×

R > Metstat > Tugas Metstat Responsi 05 > Res5.r > [LATIHAN 2]

```r


# [ LATIHAN 2 ] ==============================================================
# (4.51) Wackerly, et al., 2008

# Question :
# P(X>65|X>55)?
cat("  P(X>65|X>55)=", punif(65, min = 50, max = 70, lower.tail = FALSE)
                    / punif(55, min = 50, max = 70, lower.tail = FALSE))
#=============================================================================
```

Output :

```
> # [ LATIHAN 2 ] ==============================================================
> # (4.51) Wackerly, et al., 2008
>
> # Question :
> # P(X>65|X>55)?
> cat("  P(X>65|X>55)=", punif(65, min = 50, max = 70, lower.tail = FALSE)
+                     / punif(55, min = 50, max = 70, lower.tail = FALSE))
  P(X>65|X>55)= 0.3333333> #=================================================
```

[Latihan 3]

Let y be a normal random variable with $\mu = 500$ and $\sigma = 100$. Find the following probabilities:

a. $P(500 < y < 665)$

b. $P(y > 665)$

c. $P(304 < y < 665)$

d. k such that $P(500 - k < y < 500 + k) = 0.60$

Jawab :

Code

Res5.r M

R > Metstat > Tugas Metstat Responsi 05 > Res5.r > ? [LATIHAN 3]

```r
#? [ LATIHAN 3 ] ==============================================================

#? Question :
#? a). P(500<y<665)
cat("  P(500<y<665)=", pnorm(665, mean = 500, sd = 100, lower.tail = TRUE)
                    - pnorm(500, mean = 500, sd = 100, lower.tail = TRUE))

#? b). P(y>665)
cat("  P(y>665)=", pnorm(665, mean = 500, sd = 100, lower.tail = FALSE))

#? c). P(304<y<665)
cat("  P(304<y<665)=", pnorm(665,  mean = 500,  sd = 100,  lower.tail = TRUE)
                    - pnorm(304,  mean = 500,  sd = 100, lower.tail = TRUE))

#? d). k such that P 500 - k < y < 500 + k  =  0.60
cat("  P(y<500)=", pnorm(500, mean = 500, sd = 100, lower.tail = TRUE))
#? nilai P(y<500)  =  0.5
#? karena p(500-k<y<500) = 0.60/2 = 0.30 maka nilai P(k<500) = 0.5-0.3 = 0.2
cat("  500-k=", qnorm(0.2, mean = 500, sd = 100))
#? nilai titik interval bawahnya (500k) nya 415.8379
k <- 500 - 415.8379
k
#?============================================================================
```

[Latihan 3]

Output :

```
> #? [ LATIHAN 3 ] ==============================================================
>
> #? Question :
> #? a). P(500<y<665)
> cat("  P(500<y<665)=", pnorm(665, mean = 500, sd = 100, lower.tail = TRUE)
+                     - pnorm(500, mean = 500, sd = 100, lower.tail = TRUE))
  P(500<y<665)= 0.4505285>
> #? b). P(y>665)
> cat("  P(y>665)=", pnorm(665, mean = 500, sd = 100, lower.tail = FALSE))
  P(y>665)= 0.04947147>
> #? c). P(304<y<665)
> cat("  P(304<y<665)=", pnorm(665,  mean = 500,  sd = 100,  lower.tail = TRUE)
+                     - pnorm(304,  mean = 500,  sd = 100, lower.tail = TRUE))
  P(304<y<665)= 0.9255306>
> #? d). k such that P 500 − k < y < 500 + k  =  0.60
> cat("  P(y<500)=", pnorm(500, mean = 500, sd = 100, lower.tail = TRUE))
  P(y<500)= 0.5> #? nilai P(y<500)  =  0.5
> #? karena p(500-k<y<500) = 0.60/2 = 0.30 maka nilai P(k<500) = 0.5-0.3 = 0.2
> cat("  500-k=", qnorm(0.2, mean = 500, sd = 100))
  500-k= 415.8379> #? nilai titik interval bawahnya (500k) nya 415.8379
> k <- 500 - 415.8379
> k
[1] 84.1621
> #?=============================================================================
```

[Latihan 4]

Mendenhall, *et al.*, 2013

6.18 Hamburger Meat The meat department at a local supermarket specifically prepares its "1-pound" packages of ground beef so that there will be a variety of weights, some slightly more and some slightly less than 1 pound. Suppose that the weights of these "1-pound" packages are normally distributed with a mean of 1.00 pound and a standard deviation of .15 pound.

a. What proportion of the packages will weigh more than 1 pound?

b. What proportion of the packages will weigh between .95 and 1.05 pounds?

c. What is the probability that a randomly selected package of ground beef will weigh less than .80 pound?

d. Would it be unusual to find a package of ground beef that weighs 1.45 pounds? How would you explain such a large package?

Jawab :

Code

Res5.r M ×

R > Metstat > Tugas Metstat Responsi 05 > Res5.r > * [LATIHAN 4]

```r
#* [ LATIHAN 4 ] ==================================================================
#* Mendenhall et al., 2013
#* (6.18) {Hamburger Meat}

#* Question :
#* a).P(x>1)
cat("  P(x>1)=", pnorm(1, mean = 1, sd = 0.15, lower.tail = TRUE))

#* b). P(0.95<x<1.05)
cat("  P(0.95<y<1.05)=", pnorm(1.05,  mean = 1,  sd = 0.15,  lower.tail = TRUE)
                      - pnorm(0.95,  mean = 1,  sd = 0.15, lower.tail = TRUE))

#* c). P(x<0.80)
cat("  P(x<0.80) = ", pnorm(0.80,  mean = 1,  sd = 0.15,  lower.tail = TRUE))

#* d). P(y = 45)
cat("  P(y = 45) = ", pnorm(1.45,  mean = 1,  sd = 0.15,  lower.tail = TRUE)
                   - pnorm(1.45,  mean = 1,  sd = 0.15, lower.tail = TRUE))
#*=================================================================================
```

[Latihan 4]

Output :

```
> #* [ LATIHAN 4 ] ===============================================================
> #* Mendenhall et al., 2013
> #* (6.18) {Hamburger Meat}
>
> #* Question :
> #* a).P(x>1)
> cat("  P(x>1)=", pnorm(1, mean = 1, sd = 0.15, lower.tail = TRUE))
  P(x>1)= 0.5>
> #* b). P(0.95<x<1.05)
> cat("  P(0.95<y<1.05)=", pnorm(1.05,  mean = 1,  sd = 0.15,  lower.tail = TRUE)
+                      -  pnorm(0.95,  mean = 1,  sd = 0.15, lower.tail = TRUE))
  P(0.95<y<1.05)= 0.2611173>
> #* c). P(x<0.80)
> cat("  P(x<0.80) = ", pnorm(0.80,  mean = 1,  sd = 0.15,  lower.tail = TRUE))
  P(x<0.80) =  0.09121122>
> #* d). P(y = 45)
> cat("  P(y = 45) = ", pnorm(1.45,  mean = 1,  sd = 0.15,  lower.tail = TRUE)
+                 -  pnorm(1.45,  mean = 1,  sd = 0.15, lower.tail = TRUE))
  P(y = 45) =  0> #*==============================================================
```

[Latihan 5]

Agresti, *et al.*, 2018

6.63 Normal heart rate The normal resting heart rate for adults is 60 to 100 beats per minute. The heartbeat rate in a sample of 400 patients was tested. It was found that the distribution of the number of beats per minute is roughly normally distributed with an average of 80 and a standard deviation of 12.

a. Find the proportion of individuals in the sample whose heartbeat rate is in the normal range.

b. Tachycardia refers to any heartbeat rate greater than 100 beats per minute. Estimate the number of individuals in the sample who could have tachycardia.

Jawab :

Code

Res5.r M

R > Metstat > Tugas Metstat Responsi 05 > Res5.r > ! [LATIHAN 5]

```r
#! [ LATIHAN 5 ] ===============================================================
#! Agresti, et al., 2018
#! (6.63) {Normal heart rate}

#! Question :
#! a). P(60<x<100)
cat("  P(60<x<100)=", pnorm(100,  mean = 80,  sd = 12,  lower.tail = TRUE)
                   -  pnorm(60,  mean = 80,  sd = 12, lower.tail = TRUE))

#! b). P(x>100)
cat("  P(x>100)=", pnorm(100,  mean = 80,  sd = 12,  lower.tail = FALSE))
#!==============================================================================
```

Output :

```
> #!  [ LATIHAN 5 ] ==================================================
> #! Agresti, et al., 2018
> #!  (6.63) {Normal heart rate}
>
> #!  Question :
> #!  a). P(60<x<100)
> cat("  P(60<x<100)=", pnorm(100,  mean = 80,  sd = 12,  lower.tail = TRUE)
+                    -  pnorm(60,  mean = 80,  sd = 12, lower.tail = TRUE))
  P(60<x<100)= 0.9044193>
> #!  b). P(x>100)
> cat("  P(x>100)=", pnorm(100,  mean = 80,  sd = 12,  lower.tail = FALSE))
  P(x>100)= 0.04779035> #!=================================================
```

[Latihan 6]

Agresti, *et al.*, 2018

6.67 Used car prices Data from the Web site carmax.com compiled in July 2014 show that prices for used Audi A4 cars advertised on the Web site have a mean of $23,800 and a standard deviation of $4,380. Assume a normal distribution for the price.

a. What percent of used Audi A4s cost more than $25,000?

b. What percent of used Audi A4s cost between $18,000 and $22,000?

c. The least expensive 10% of used Audi A4s offered on the Web site cost at most how much?

Jawab :

Code

Res5.r M ×

R > Metstat > Tugas Metstat Responsi 05 > Res5.r > [LATIHAN 6]

```r
# [ LATIHAN 6 ] ===============================================================
# Agresti, et al., 2018
# (6.67) {Used car prices}

# Question :
# a). P(x>25000)
cat("  P(x>25000)=", pnorm(25000,  mean = 23800,  sd = 4380,  lower.tail =
                                                                  FALSE))
cat("  persentase=", 100 *
                  pnorm(25000,  mean = 23800,  sd = 4380,  lower.tail = FALSE),
                                                                     "%")

# b).P(18000<x<22000)
cat("  P(18000<x<22000)=", pnorm(22000,  mean = 23800,  sd = 4380,
                                                    lower.tail = TRUE)
                        - pnorm(18000,  mean = 23800,  sd = 4380,
                                                    lower.tail = TRUE))
cat("  persentase=", 100 *
                 (pnorm(22000,  mean = 23800,  sd = 4380,  lower.tail = TRUE)
                 - pnorm(18000,  mean = 23800,  sd = 4380, lower.tail = TRUE)),
                                                                    "%")

# c).
cat("  harga=", qnorm(0.1, mean = 23800, sd = 4380))
#==============================================================================
```

[Latihan 6]

Output :

```
> # [ LATIHAN 6 ] ==============================================================
> # Agresti, et al., 2018
> # (6.67) {Used car prices}
>
> # Question :
> # a). P(x>25000)
> cat("  P(x>25000)=", pnorm(25000,  mean = 23800,  sd = 4380,  lower.tail =
+                                                                     FALSE))
  P(x>25000)= 0.3920528> cat("  persentase=", 100 *
+                   pnorm(25000,  mean = 23800,  sd = 4380,  lower.tail = FALSE),
+                                                                          "%")
  persentase= 39.20528 %>
> # b).P(18000<x<22000)
> cat("  P(18000<x<22000)=", pnorm(22000,  mean = 23800,  sd = 4380,
+                                                               lower.tail = TRUE)
+                         - pnorm(18000,  mean = 23800,  sd = 4380,
+                                                               lower.tail = TRUE))
  P(18000<x<22000)= 0.2478332> cat("  persentase=", 100 *
+                  (pnorm(22000,  mean = 23800,  sd = 4380,  lower.tail = TRUE)
+                 - pnorm(18000,  mean = 23800,  sd = 4380, lower.tail = TRUE)),
+                                                                        "%")
  persentase= 24.78332 %>
> # c).
> cat("  harga=", qnorm(0.1, mean = 23800, sd = 4380))
  harga= 18186.8> #=================================================================
```

[Latihan 7]

Mendenhall, *et al.*, 2013

6.50 The Rh Factor In a certain population, 15% of the people have Rh-negative blood. A blood bank serving this population receives 92 blood donors on a particular day.

a. What is the probability that 10 or fewer are Rh-negative?

b. What is the probability that 15 to 20 (inclusive) of the donors are Rh-negative?

c. What is the probability that more than 80 of the donors are Rh-positive?

Jawab :

Code

```r
#? [ LATIHAN 7 ] ==============================================================
#? Mendenhall, et al., 2013
#? (6.50) {The Rh Factor}

#? Question :
#? a). P(x<=10)
cat("  P(X>=10)=", pbinom(10, size = 92,  prob = 0.15, lower.tail = FALSE))

#? b). P(15<x<20)
cat("  P(15<x<20)=", pbinom(20, size = 92,  prob = 0.15, lower.tail = TRUE)
                   - pbinom(15, size = 92,  prob = 0.15, lower.tail = TRUE))

#?)c). P(x>80)
cat("  P(X>80)=", pbinom(80, size = 92,  prob = 0.15, lower.tail = FALSE))
#?==================================================================================
```

[Latihan 7]

Output :

```
> #? [ LATIHAN 7 ] ==============================================================
> #? Mendenhall, et al., 2013
> #? (6.50) {The Rh Factor}
>
> #? Question :
> #? a). P(x<=10)
> cat("  P(X>=10)=", pbinom(10, size = 92,  prob = 0.15, lower.tail = FALSE))
  P(X>=10)= 0.8320598>
> #? b). P(15<x<20)
> cat("  P(15<x<20)=", pbinom(20, size = 92,  prob = 0.15, lower.tail = TRUE)
+                    - pbinom(15, size = 92,  prob = 0.15, lower.tail = TRUE))
  P(15<x<20)= 0.2708177>
> #?)c). P(x>80)
> cat("  P(X>80)=", pbinom(80, size = 92,  prob = 0.15, lower.tail = FALSE))
  P(X>80)= 1.689567e-54> #?=====================================================
```

[Latihan 8]

Mendenhall, *et al.*, 2013

6.82 Long Distance It is known that 30% of all calls coming into a telephone exchange are long-distance calls. If 200 calls come into the exchange, what is the probability that at least 50 will be long-distance calls?

Jawab :
Code

```
Res5.r  M  X
R > Metstat > Tugas Metstat Responsi 05 > Res5.r > * [ LATIHAN 8 ]
[ LATIHAN 8 ] ==================================================================
Mendenhall, et al., 2013
(6.82) {Long Distance}

Question :
P(x>=50)
t("  P(X>=50)=", pbinom(50, size = 200,  prob = 0.3, lower.tail = FALSE))
================================================================================
```

Output :

```
> #* [ LATIHAN 8 ] ===============================================================
> #* Mendenhall, et al., 2013
> #* (6.82) {Long Distance}
>
> #* Question :
> #* P(x>=50)
> cat("  P(X>=50)=", pbinom(50, size = 200,  prob = 0.3, lower.tail = FALSE))
  P(X>=50)= 0.9304547> #*=========================================================
```

>Thank You!_