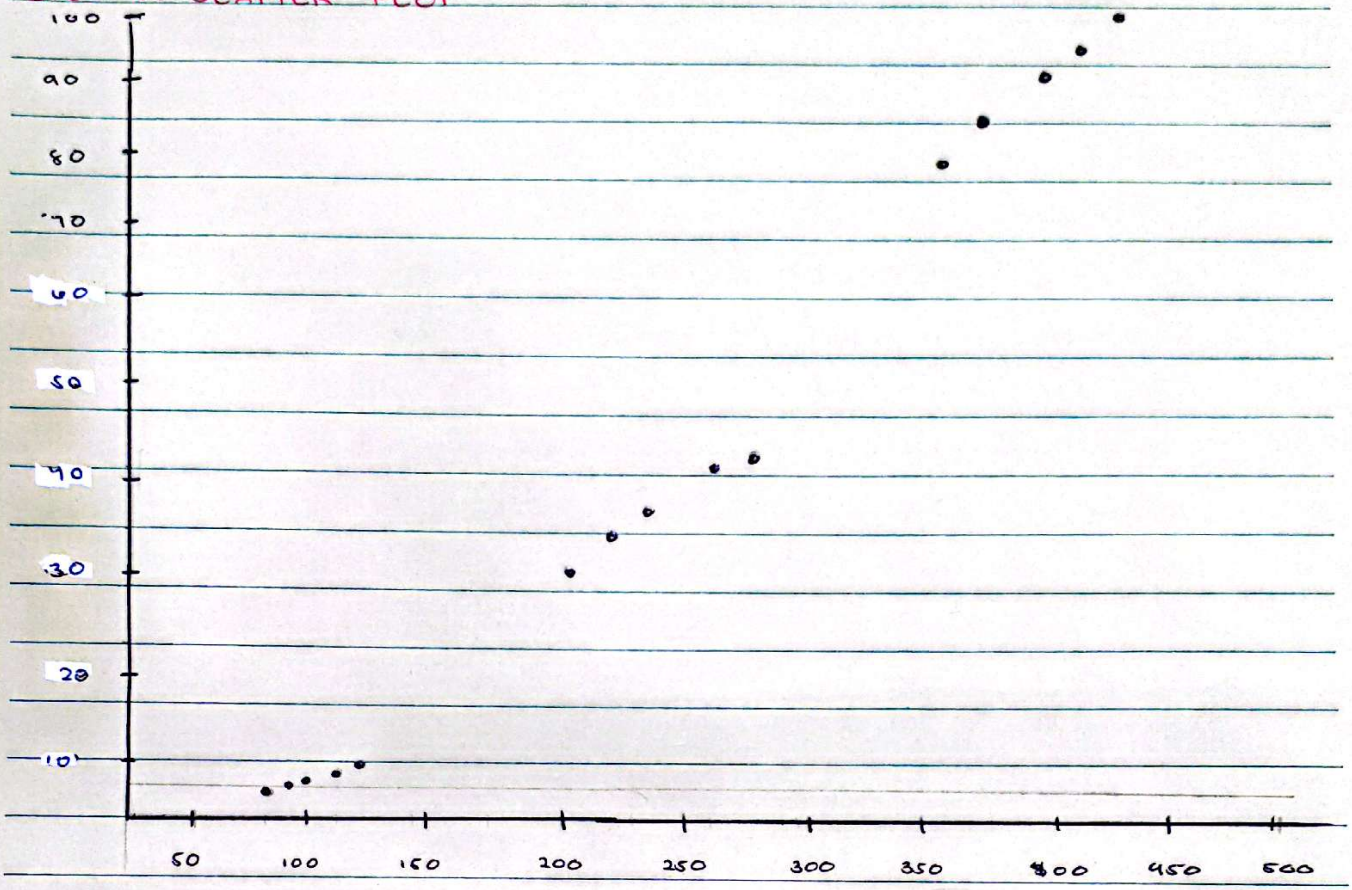
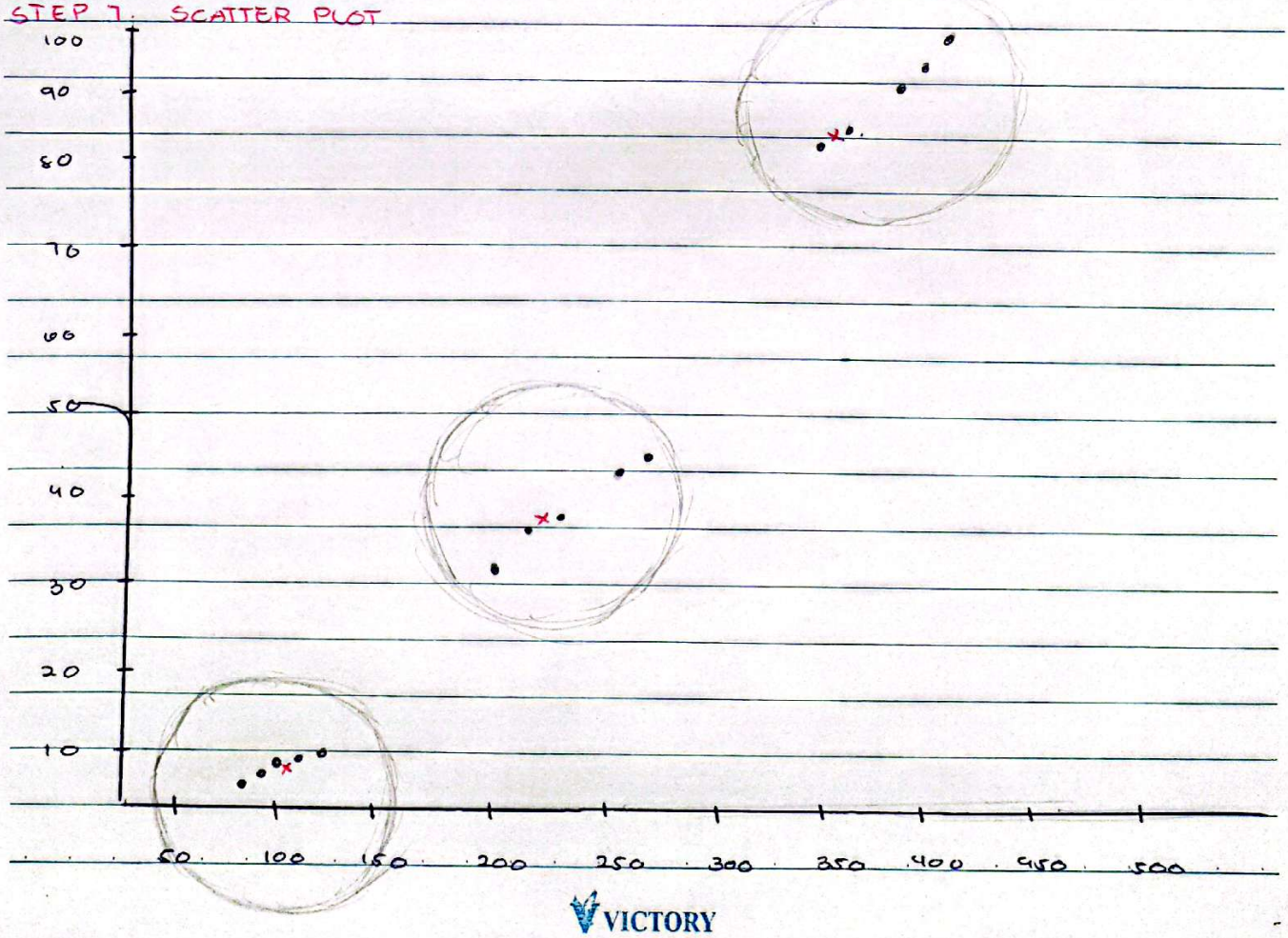
NO.:
DATE:

PAULOS, RAE S. COM232 EXERCISE 1

STEP 1. SCATTER PLOT



STEP 7. SCATTER PLOT



VICTORY

NO.:
DATE:

PAULOS, RAE S. COM232 EXERCISE 1

3. CLUSTER 3 SUMMARY

POOR — RICH — MID

NAME	MONEY	MINUTES	D1	D2	D3	CLUSTER
CHLOE MENDOZA	380	85	310.48	30.411	188.22	RICH
ANNA REYES	80	5	0	280.22	122.58	POOR
MIKA TAN	280	45	203.96	78.26	81.39	RICH
ZACH UY	400	90	331.09	50.99	208.81	RICH
KEVIN RAMOS	220	35	143.18	83.22	20.66	MID
SOFIA PIÑA	110	9	30.27	250.28	92.42	POOR
BRIAN LIM	350	80	280.22	0	158.11	RICH
CALEB ONG	450	100	382.00	101.98	259.61	RICH
LIAM CRUZ	100	8	20.22	260.16	102.39	POOR
ELLA NAVARRO	240	38	163.37	117.75	40.79	MID
JOHN MERCADO	120	10	40.31	240.42	82.46	POOR
JARED FLORES	260	42	183.76	97.69	61.19	MID
MARK SANTOS	95	7	15.13	265.24	107.49	POOR
PAULA GOMEZ	200	30	122.58	158.11	0	MID
HANNAH ROQUE	420	95	351.71	71.59	229.40	RICH

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2. EUCLIDEAN DISTANCE

$D = \sqrt{(x-a)^2 + (y-b)^2}$

D1 (80, 5) D2 (350, 80) D3 (200, 30)

CHLOE MENDOZA (380, 85)

$D_1 = \sqrt{(380-80)^2 + (85-5)^2}$
$= 310.48$

$D_2 = \sqrt{(380-350)^2 + (85-80)^2}$
$= 30.41$

$D_3 = \sqrt{(380-200)^2 + (85-30)^2}$
$= 188.22$

ANNA REYES (80, 5)

$D_1 = \sqrt{(80-80)^2 + (5-5)^2}$
$= 0$

$D_2 = \sqrt{(80-350)^2 + (5-80)^2}$
$= 280.22$

$D_3 = \sqrt{(80-200)^2 + (5-30)^2}$
$= 122.58$

MIKA TAN (280, 45)

$D_1 = \sqrt{(280-80)^2 + (45-5)^2}$
$= 203.96$

$D_2 = \sqrt{(280-350)^2 + (45-80)^2}$
$= 78.26$

$D_3 = \sqrt{(280-200)^2 + (45-30)^2}$
$= 81.39$

ZACH OY (400, 90)

$D_1 = \sqrt{(400-80)^2 + (90-5)^2}$
$= 331.09$

$D_2 = \sqrt{(400-350)^2 + (90-80)^2}$
$= 50.99$

$D_3 = \sqrt{(400-280)^2 + (90-30)^2}$
$= 208.81$

KEVIN RAMOS (220, 35)

$D_1 = \sqrt{(220-80)^2 + (35-5)^2}$
$= 143.18$

$D_2 = \sqrt{(220-350)^2 + (35-80)^2}$
$= 83.22$

$D_3 = \sqrt{(220-200)^2 + (35-30)^2}$
$= 20.66$

SOFIA DELA PEÑA (110, 9)

$D_1 = \sqrt{(110-80)^2 + (9-5)^2}$
$= 30.27$

$D_2 = \sqrt{(110-350)^2 + (9-80)^2}$
$= 250.28$

$D_3 = \sqrt{(110-200)^2 + (9-30)^2}$
$= 92.42$

BRIAN LIM (350, 80)

$D_1 = \sqrt{(350-80)^2 + (80-5)^2}$
$= 280.22$

$D_2 = \sqrt{(350-350)^2 + (80-80)^2}$
$= 0$

$D_3 = \sqrt{(350-200)^2 + (80-30)^2}$
$= 158.11$

CALEB ONG (450, 100)

$D_1 = \sqrt{(450-80)^2 + (100-5)^2}$
$= 382.00$

$D_2 = \sqrt{(450-350)^2 + (100-80)^2}$
$= 101.98$

$D_3 = \sqrt{(450-200)^2 + (100-30)^2}$
$= 259.61$

D1 (80, 5)
D2 (350, 80)
D3 (200, 30)

NO.:
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LIAM CRUZ (100, 8)

$D_1 = \sqrt{(100-80)^2+(8-5)^2}$

$= 20.22$

$D_2 = \sqrt{(100-350)^2+(8-80)^2}$

$= 260.161$

$D_3 = \sqrt{(100-200)^2+(8-30)^2}$

$= 102.39$

ELLA NAVARRO (240, 38)

$D_1 = \sqrt{(240-80)^2+(38-5)^2}$

$= 163.37$

$D_2 = \sqrt{(240-350)^2+(38-80)^2}$

$= 117.75$

$D_3 = \sqrt{(240-200)^2+(38-30)^2}$

$= 40.79$

JOHN MERCADO (120, 10)

$D_1 = \sqrt{(120-80)^2+(10-5)^2}$

$= 40.31$

$D_2 = \sqrt{(120-350)^2+(10-80)^2}$

$= 240.412$

$D_3 = \sqrt{(120-200)^2+(10-30)^2}$

$= 82.46$

JARED FLORES (260, 412)

$D_1 = \sqrt{(260-80)^2+(412-5)^2}$

$= 183.76$

$D_2 = \sqrt{(260-350)^2+(412-80)^2}$

$= 97.69$

$D_3 = \sqrt{(260-200)^2+(412-30)^2}$

$= 61.19$

MARK SANTOS (95, 7)

$D_1 = \sqrt{(95-80)^2+(7-5)^2}$

$= 15.13$

$D_2 = \sqrt{(95-350)^2+(7-80)^2}$

$= 265.24$

$D_3 = \sqrt{(95-200)^2+(7-30)^2}$

$= 107.49$

PAULA GOMEZ (200, 30)

$D_1 = \sqrt{(200-80)^2+(30-5)^2}$

$= 122.58$

$D_2 = \sqrt{(200-350)^2+(30-80)^2}$

$= 158.11$

$D_3 = \sqrt{(200-200)^2+(30-30)^2}$

$= 0$

HANNAH ROQUE (420, 95)

$D_1 = \sqrt{(420-80)^2+(95-5)^2}$

$= 351.71$

$D_2 = \sqrt{(420-350)^2+(95-80)^2}$

$= 71.59$

$D_3 = \sqrt{(420-200)^2+(95-30)^2}$

$= 229.40$

NO.:
DATE:

1. CALCULATE THE MEAN OF EACH CLUSTER

POOR

$a_1 = \frac{(80 + 110 + 100 + 120 + 95)}{5} = 101$

$b_1 = \frac{(5 + 9 + 8 + 10 + 7)}{5} = 7.8$

$\Rightarrow (101, 7.8)$

RICH

$a_2 = \frac{(380 + 280 + 400 + 350 + 450 + 420)}{6} = 380$

$b_2 = \frac{(85 + 75 + 90 + 80 + 100 + 95)}{6} = 82.5$

$(380, 82.5)$

MID

$a_3 = \frac{(220 + 240 + 260 + 200)}{4} = 230$

$b_3 = \frac{(35 + 38 + 42 + 30)}{4} = 36.25$

$(230, 36.25)$

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5. DISTANCE FROM THE MEAN

$D_1 = (101, 7.8)$

$D_2 = (380, 82.5)$

$D_3 = (230, 36.25)$

CHLOE MENDOZA (380, 85)

$D_1 = \sqrt{(380-101)^2 + (85-7.8)^2}$

$= 289.418$

$D_2 = \sqrt{(380-380)^2 + (85-82.5)^2}$

$= 2.5$

$D_3 = \sqrt{(380-230)^2 + (85-36.25)^2}$

$= 157.72$

ANNA REYES (80, 5)

$D_1 = \sqrt{(80-101)^2 + (5-7.8)^2}$

$= 21.19$

$D_2 = \sqrt{(80-380)^2 + (5-82.5)^2}$

$= 309.85$

$D_3 = \sqrt{(80-230)^2 + (5-36.25)^2}$

$= 153.22$

MIKA TAN (280, 45)

$D_1 = \sqrt{(280-101)^2 + (45-7.8)^2}$

$= 182.82$

$D_2 = \sqrt{(280-380)^2 + (45-82.5)^2}$

$= 106.8$

$D_3 = \sqrt{(280-230)^2 + (45-36.25)^2}$

$= 50.76$

ZACH UY (400, 90)

$D_1 = \sqrt{(400-101)^2 + (90-7.8)^2}$

$= 310.1$

$D_2 = \sqrt{(400-380)^2 + (90-82.5)^2}$

$= 21.36$

$D_3 = \sqrt{(400-230)^2 + (90-36.25)^2}$

$= 178.29$

KEVIN RAMOS (220, 35)

$D_1 = \sqrt{(220-101)^2 + (35-7.8)^2}$

$= \sqrt{122.07}$

$D_2 = \sqrt{(220-380)^2 + (35-86.5)^2}$

$= 166.90$

$D_3 = \sqrt{(220-230)^2 + (35-36.25)^2}$

$= 10.08$

SOFIA DELA PEÑA (110, 9)

$D_1 = \sqrt{(110-101)^2 + (9-7.8)^2}$

$= 9.08$

$D_2 = \sqrt{(110-380)^2 + (9-86.5)^2}$

$= 279.83$

$D_3 = \sqrt{(110-230)^2 + (35-36.25)^2}$

$= 123.06$

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BRIAN LIM (350, 80)

$D_1 = \sqrt{(350-101)^2 + (80-7.5)^2}$

$= 259.26$

$D_2 = \sqrt{(350-380)^2 + (80-82.5)^2}$

$= 30.10$

$D_3 = \sqrt{(350-230)^2 + (80-30.25)^2}$

$= 127.73$

CALEB ONG (450, 110)

$D_1 = \sqrt{(450-101)^2 + (110-7.5)^2}$

$= 363.66$

$D_2 = \sqrt{(450-380)^2 + (110-82.5)^2}$

$= 75.121$

$D_3 = \sqrt{(450-230)^2 + (110-30.25)^2}$

$= 232.03$

LIAM CRUZ (100, 8)

$D_1 = \sqrt{(100-101)^2 + (8-7.5)^2}$

$= 1.02$

$D_2 = \sqrt{(100-380)^2 + (8-82.5)^2}$

$= 289.74$

$D_3 = \sqrt{(100-230)^2 + (8-30.25)^2}$

$= 133.03$

ELLA NAVARRO (240, 38)

$D_1 = \sqrt{(240-101)^2 + (38-7.5)^2}$

$= 142.24$

$D_2 = \sqrt{(240-380)^2 + (38-82.5)^2}$

$= 146.90$

$D_3 = \sqrt{(240-230)^2 + (38-30.25)^2}$

$= 10.15$

JOHN MERCADO (120, 10)

$D_1 = \sqrt{(120-101)^2 + (10-7.5)^2}$

$= 19.13$

$D_2 = \sqrt{(120-380)^2 + (10-82.5)^2}$

$= 269.92$

$D_3 = \sqrt{(120-230)^2 + (10-30.25)^2}$

$= 113.09$

JARED FLORES (260, 42)

$D_1 = \sqrt{(260-101)^2 + (42-7.5)^2}$

$= 162.64$

$D_2 = \sqrt{(260-380)^2 + (42-82.5)^2}$

$= 126.65$

$D_3 = \sqrt{(260-230)^2 + (42-30.25)^2}$

$= 30.55$

MARK SANTOS (95, 7)

$D_1 = \sqrt{(95-101)^2 + (7-7.5)^2}$

$= 6.05$

$D_2 = \sqrt{(920-380)^2 + (7-82.5)^2}$

$= 2941.83$

$D_3 = \sqrt{(95-230)^2 + (7-30.25)^2}$

$= 135.13$

PAULA GOMEZ (200, 30)

$D_1 = \sqrt{(200-101)^2 + (30-7.5)^2}$

$= 101.46$

$D_2 = \sqrt{(200-380)^2 + (30-82.5)^2}$

$= 187.5$

$D_3 = \sqrt{(200-230)^2 + (30-30.25)^2}$

$= 30.64$

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HANNAH ROQUE (420, 95)

$D_1 = \sqrt{(420 - 101)^2 + (95 - 7.8)^2}$

$= 330.70$

$D_2 = \sqrt{(420 - 380)^2 + (95 - 820.5)^2}$

$= 411.91$

$D_3 = \sqrt{(420 - 230)^2 + (95 - 300.25)^2}$

$= 198.88$

6. ASSIGN THE CLUSTER FOR ALL DATA POINTS

NAME	POOR D1	RICH D2	MID D3	CLUSTER
CHLOE MENDOZA	289.418	2.5	157.72	RICH
ANNA REYES	21.19	309.85	153.22	POOR
MIKA TAN	182.82	106.8	50.76	MID
ZACH UY	310.1	21.36	178.29	RICH
KEVIN RAMOS	122.07	166.90	10.08	MID
SOFIA DEÑA	9.08	279.83	123.06	POOR
BRIAN LIM	259.26	30.10	127.73	RICH
CALEB ONG	363.66	75.21	232.03	RICH
LIAM CRUZ	1.02	259.74	133.03	POOR
ELLA NAVARRO	112.24	116.90	10.15	MID
JOHN MERCADO (~~FLORES~~)	19.13	269.92	113.09	POOR
JARED FLORES (~~SANTOS~~)	102.64	120.05	30.55	MID
MARK SANTOS	6.05	294.83	138.13	POOR
PAULA GOMEZ	101.46	187.5	30.64	MID
HANNAH ROQUE	330.70	411.91	198.88	RICH