GUESS: Problem Solving Method

Academic Learning Centre
205 Tier
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umanitoba.ca/student/academic learning
**QUESTION**: The correlation between student midterm scores and final exam scores is 0.55. The midterm scores for all students has a mean of 85 and a standard deviation of 6, while the final exam has a mean of 70 and standard deviation of 9. Gloria scored 93 on the midterm. **What mark can we predict for her final exam score?**
The correlation between student midterm scores and final exam scores is 0.55. The midterm scores for all students has a mean of 85 and a standard deviation of 6, while the final exam scores has a mean of 70 and standard deviation of 9. Gloria scored 93 on the midterm. **What can we predict her final exam score to be?**

| Given: | Correlation \((r) = 0.55\)  
Midterm mean \((\bar{x}) = 85\)  
Midterm Standard deviation \((S_x) = 6\)  
Final exam mean \((\bar{y}) = 70\)  
Final exam Standard deviation \((S_y) = 9\)  
Gloria’s Midterm score \((x) = 93\) |
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| Given: | Correlation (r) = 0.55  
|        | Midterm mean (x̄) = 85  
|        | Midterm Standard deviation (Sₓ) = 6  
|        | Final exam mean (ȳ) = 70  
|        | Final exam Standard deviation (Sᵧ) = 9  
|        | Gloria’s Midterm score (x) = 93  |

| Unknown: | Intercept (b₀) = ?  
|          | Slope (b₁) = ?  
|          | Gloria’s Final exam score (Ŷ) = ?  |

| Equations: |  |
| Set-up: |  |
| Solve: |  |
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| Given:          | Correlation \(r\) = 0.55  
|                 | Midterm mean \(\bar{x}\) = 85  
|                 | Midterm Standard deviation \(S_x\) = 6  
|                 | Final exam mean \(\bar{y}\) = 70  
|                 | Final exam Standard deviation \(S_y\) = 9  
|                 | Gloria’s Midterm score \(x\) = 93  |

| Unknown:        | Intercept \(b_0\) = ?  
|                 | Slope \(b_1\) = ?  
|                 | Gloria’s Final exam score \(\hat{Y}\) = ?  |

| Equations:      | \(b_1 = r \times \frac{S_y}{S_x}\)  
|                 | \(b_0 = \bar{y} - b_1 \bar{x}\)  
|                 | \(\hat{Y} = b_0 + b_1 x\)  |

| Set-up:         |  

| Solve:          |  

| Given: | Correlation (r) = 0.55  
|        | Midterm mean (\(\bar{x}\)) = 85  
|        | Midterm Standard deviation (\(S_x\)) = 6  
|        | Final exam mean (\(\bar{y}\)) = 70  
|        | Final exam Standard deviation (\(S_y\)) = 9  
|        | Gloria's Midterm score (x) = 93  
| Unknown: | Intercept (\(b_0\)) = ?  
|          | Slope (\(b_1\)) = ?  
|          | Gloria's Final exam score (\(\hat{y}\)) = ?  
| Equations: | \(b_1 = r * \frac{S_y}{S_x}\)  
|            | \(b_0 = \bar{y} - b_1 \bar{x}\)  
|            | \(\hat{y} = b_0 + b_1 x\)  
| Set-up: | \(b_1 = 0.55 * \frac{9}{6}\)  
|          | \(b_1 = 0.825\)  
|          | \(b_0 = 70 - 0.825 \times 85\)  
|          | \(b_0 = -0.125\)  
| Solve: |
**Given:**
- Correlation \((r) = 0.55\)
- Midterm mean \((\bar{x}) = 85\)
- Midterm Standard deviation \((S_x) = 6\)
- Final exam mean \((\bar{y}) = 70\)
- Final exam Standard deviation \((S_y) = 9\)
- Gloria’s Midterm score \((x) = 93\)

**Unknown:**
- Intercept \((b_0) = \) ?
- Slope \((b_1) = \) ?
- Gloria’s Final exam score \((\hat{y}) = \) ?

**Equations:**
- \(b_1 = r \cdot \frac{S_y}{S_x}\)
- \(b_0 = \bar{y} - b_1 \bar{x}\)
- \(\hat{y} = b_0 + b_1 x\)

**Set-up:**
- \(b_1 = 0.55 \cdot \frac{9}{6}\)
  - \(b_1 = 0.825\)
- \(b_0 = 70 - 0.825 \cdot (85)\)
  - \(b_0 = -0.125\)

**Solve:**
- \(\hat{y} = b_1 x + b_0\)
  - \(\hat{y} = 0.825 \cdot 93 + (-0.125)\)
  - \(\hat{y} = 76.6\)
Campus Resources

- Professors and Teaching Assistants

- Academic Learning Centre Tutors

- Help Centres
  - Math (412 Machray Hall)
  - Computer Science (E2-422A Engineering)
  - Statistics (311 Machray Hall)
  - Physics (114 Allen)
  - Chemistry (128 Parker)

- Tutors on campus
**Academic Learning Centre**

We offer:
- **One to One** tutoring
- **Workshops**
- **Supplemental Instruction**

[Website]
Academic Learning Centre

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Bannatyne Reception Desk: S211 Medical Services Building