DS 1000B: Midterm Exam

Information Sheet

Winter 2026

When & Where

Exam Details

Date: Sunday, March 1st, 2026

Time: 2:00 PM – 4:00 PM (120 minutes)

Duration: 2 hours

Room Assignments

Section	Last Name	Room
002 (Marieke Mur)	A – Z	TBD
003 (Pavel Shuldiner)	A – Z	TBD

If you are writing with Accessible Education, please confirm your arrangements with AE directly. They require at least 10 business days notice to arrange accommodations.

Allowed Aids

- **Calculator:** Non-programmable, non-graphing.
- **Formula sheet:** Please find a copy of it at the end of this document. A copy will be provided during the exam. Do **not** bring your own.
- **Photo ID:** Please bring valid photo identification.

Content Coverage

The midterm covers all material from **Chapters 1, 2, 4, 5, 6, 12** of the course notes, including but not limited to:

Chapter	Topics
Chapter 1	Variable types, individuals/variables, data visualization basics
Chapter 2	Measures of center, boxplots
Chapter 4	Scatterplots, correlation
Chapter 5	Least-squares regression, residuals, R^2, extrapolation
Chapter 6	Contingency tables, conditional distributions, relative risk, odds ratio
Chapter 12	Sample spaces, events, probability rules, random variables

Approximate Weighting

Topic Area	Approx. % of Exam
Chapter 1: Data Visualization	15%
Chapter 2: Descriptive Statistics	20%
Chapter 4: Correlation	10%
Chapter 5: Regression	30%
Chapter 6: Contingency Tables	10%
Chapter 12: Probability	15%
Total	**100%**

Exam Format

The exam consists of two parts:

Section	Question Type	Weight
Part A	Multiple Choice (15 questions)	15%
Part B	Short Answer	85%

Please see the final page of this document to view the cover page of the midterm exam.

Preparation Tips

- **Highly recommended:** Practice by completing the past midterm and cumulative problem set under exam-like conditions (timed, using only permitted aids). A similar approach would also be recommended when reviewing lecture notes.
- Carefully review your lecture notes and assignments.
- Attend scheduled office hours (TBD) and review sessions during labs (dates can be found in syllabus).
- Please see the Midterm FAQ thread on Piazza prior to submitting new questions. There is a good chance your question has already been answered there.

Important Reminders

Please read carefully:

- **Do not write on or near the barcodes** at the top of exam pages. This renders them unscannable and may result in zero marks for those questions.
- **Do not use colored pens, markers, or highlighters**. They do not scan properly.
- **Bring a photo ID** to the exam.
- **There will be no makeup midterm.** We strongly encourage all students to write the midterm.

Good luck with your preparation!

— Marieke Mur & Pavel Shuldiner

DS 1000B Winter 2026

Midterm Formula Sheet

Descriptive Statistics

Mean:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} = \frac{x_1 + x_2 + \cdots + x_n}{n}$$

Variance:

$$s^2 = \frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}$$

Standard Deviation:

$$s = \sqrt{s^2} = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

Interquartile Range:

$$\text{IQR} = Q_3 - Q_1$$

Outlier Fences (1.5×IQR Rule):

$$\text{Lower: } Q_1 - 1.5 \times \text{IQR} \quad \text{Upper: } Q_3 + 1.5 \times \text{IQR}$$

Correlation

Correlation Coefficient:

$$r = \frac{1}{n-1} \sum_{i=1}^{n} \left(\frac{x_i - \bar{x}}{s_x} \right) \left(\frac{y_i - \bar{y}}{s_y} \right)$$

Linear Regression

Regression Line:

$$\hat{y} = a + bx$$

Slope:

$$b = r \cdot \frac{s_y}{s_x}$$

Intercept:

$$a = \bar{y} - b\bar{x}$$

Residual:

$$e = y - \hat{y} = \text{observed} - \text{predicted}$$

Coefficient of Determination:

$$R^2 = r^2$$

Contingency Tables

Proportion / Risk / Probability:

$$\frac{\text{Number with outcome}}{\text{Total}}$$

Percentage:

$$\frac{\text{Number with outcome}}{\text{Total}} \times 100\%$$

Odds:

$$\frac{\text{Number with outcome}}{\text{Number without outcome}}$$

Relative Risk (RR):

$$\frac{\text{Risk in group 1}}{\text{Risk in group 2}}$$

Odds Ratio (OR):

$$\frac{\text{Odds in group 1}}{\text{Odds in group 2}}$$

Probability Rules

Complement Rule:

$$P(A^c) = 1 - P(A)$$

Addition Rule:

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

If A and B are disjoint:
$P(A \text{ or } B) = P(A) + P(B)$

Do NOT write in the area above this line.

Midterm Exam

Course: DS 1000B Winter 2026

Sections: 002, 003

Date: March 1st, 2026

2:00 – 4:00 pm (120 minutes)

Instructors:

Marieke Mur

Pavel Shuldiner

Allowed aids:

A calculator (non-programmable, non-graphing)

Formula sheet provided for you with the exam.

Full Name (print) *(e.g. Tom Marvolo Riddle):*	
Western ID *(e.g. baldemort13):*	
Student Number *(e.g. 251123456):*	

1. Legibly **print** your Western User ID, full name, and student number in the spaces provided above.
2. Do **not** detach the pages of the exam. You may ask for scrap paper if needed.
3. The space at the top of each page is reserved for the scanner. Do not write on or near the barcode.
4. The exam has 20 pages. The last three pages may be used for additional workspace or scrap paper.
5. When applicable, enter your final answer in the provided answer box rounded to 2 decimal places.

Section	**Marks**
Multiple Choice (1 mark each)	15
Miscellaneous	10
Section 1	4
Section 2	10
Section 3	7
Section 4	5
Section 5	29
Section 6	8
Section 7	12
Total	**100**