Quiz 1

Student

Rey Stone

Total Points

16 / 20 pts

Question 1

Question 1   **3** / 3 pts

Question 1 (3 pts)

Define the following events:

A: The first die is a 2. (There are 6 ways this can happen, thus $|A| = 6$)
B: The 2nd die is a 2, similarly $|B| = 6$

We want to calculate $P(A \cup B) = \frac{|A \cup B|}{\text{total number of outcomes}}$

When rolling 2 die there are a total of 6*6 = 36 total possible outcomes (6 possible outcomes for the first die and 6 for the 2nd)

By the inclusion-exclusion principle:
$$|A \cup B| = |A| + |B| - |A \cap B|$$

$$\implies |A \cup B| = 6 + 6 - 1 = 11$$

Thus $P(A \cup B) = \frac{|A \cup B|}{\text{total number of outcomes}} = \frac{11}{36}$

> ✔ **– 0 pts** Correct

Question 2

Question 2   **0** / 2 pts

Question 2 (2 pts)

Notice that this question is the exact same concept that was reviewed in HW 1 #11a:

A coin is flipped 10 times. How many possible outcomes have exactly 3 heads?   (The answer to that homework was $\binom{10}{3} = 120$)

Now instead of a coin, we have bits (0 or 1) and instead of flipping 10 times we have 14 bits and want to know how many possible outcomes have exactly six 0's.

Thus we need to figure out the number of ways we can rearrange 6 zeros when given 14 spots to place them (because the remaining spots will automatically be 1s).

We use a combination to do this:
$\binom{14}{6} = \frac{14!}{8!6!} = \boxed{3003}$

> ✔ **– 2 pts** Missing or incorrect

Question 3

Question 3   🚩 **1.5** / 3 pts

Question 3 (3 pts)

$\int_{3.5}^{\infty} g(x)\,dx = \int_{3.5}^{4} g(x)\,dx + \int_{4}^{7} g(x)\,dx$

$= \text{Area of rectangle} + \text{Area of triangle}$

$= (4 - 3.5)(0.25) + \frac{1}{2}(7 - 4)(0.25)$

(The instructions say not to use integration, thus we can calculate these areas using geometry)

$= \frac{1}{8} + \frac{3}{8} = \frac{4}{8} = \boxed{\dfrac{1}{2}}$

> ✔ **− 1.5 pts** Incorrect calculation of area from the triangle

> ① You don't need to do any integration per the instructions, just use a triangle!

Question 4

Question 4   **2** / 2 pts

Question 4 (2 pts)

False

> ✔ **− 0 pts** Correct

Question 5

Question 5   **2** / 2 pts

Question 5 (2 pts)

False

> ✔ **− 0 pts** Correct

Question 6

Question 6   **2** / 2 pts

Question 6 (2 pts)

Two 24-hr extensions and two 6 day extensions

> ✔ **− 0 pts** Correct

Question 7   **2.5** / 3 pts

Question 7 (3 pts)

- Using a solution to a CSCI 3022 HW problem found online (or another student's solution) and then editing that solution and submitting it for your HW.
- Putting any assigned question from this class into Generative AI and directly using or modifying the output when submitting your answer
- Having a cell phone, smartwatch, tablet or other online device anywhere on your body or at your desk during an exam.
- Looking at another student's answers during a quiz or exam and/or collaborating with another student during a quiz or exam.
- Attempting to falsify proof that you submitted a HW assignment, quiz or exam that you did not submit.
- When doing HW or projects, copying a segment of code solution or math solution of three lines or more from another student.
- When doing HW or projects, allowing another student to copy a segment of your code or math solution of three lines or more.
- Reading a solution to a CSCI 3022 HW problem found online (or another student's solution) before writing your own solution for that particular problem.
- Asking someone to write all or part of a program or solution for you.

> ✔ **− 0.5 pts** Missing one of the correct options

Question 8   **3** / 3 pts

Question 8 (3 pts)

- Drop 1 lowest HW score
- Drop 2 lowest quiz scores
- Drop 6 lowest attendance scores
- Final exam percentage will replace lowest midterm exam percentage, if higher

> ✔ **− 0 pts** Correct

Write **clearly** and **in the box**:

Name: Rey Stone	Student ID:

Quiz Rules:

DO NOT TURN THIS PAGE OVER UNTIL THE QUIZ BEGINS.

- All cell phones must be stored in your backpack. If you have a cell phone anywhere on your body or at your desk during this quiz you will receive a 0 on this quiz.

- You are allowed a two-sided 8.5" x 11" crib sheet with hand-written (not typed/screenshot) notes.

- You are allowed a calculator.

- No other outside resources including tablets, smartphones, smartwatches or any other electronic devices allowed.

- No collaboration with other students is allowed during this quiz.

- You have **15 minutes** for this quiz.

1. (3 pts) You roll two fair, 6-sided die. What is the probability you roll **at least one 2**? *To receive credit you must show work justifying your answer in the space below. Answers without any justification will receive 0 points. Put your final answer in the box, as a simplified fraction.*

Answer:

$$\frac{11}{36}$$

36 possible outcomes

$$\{ (x,2) \text{ or } (2,2) \text{ or } (2,x) \}$$
$$\downarrow \qquad \qquad 1-6$$
$$1-6$$

$$\frac{12-1}{36} = \frac{11}{36}. \qquad \text{I'm sorry, I don't have a calculator}$$

inclusive-exclusive principle

2. (2 pts) Recall that a bit string is a sequence of 0's and 1's. Consider all possible bit strings of length 14. How many of these contain exactly six 0's? To receive credit your final answer must be given fully simplified to a single integer.
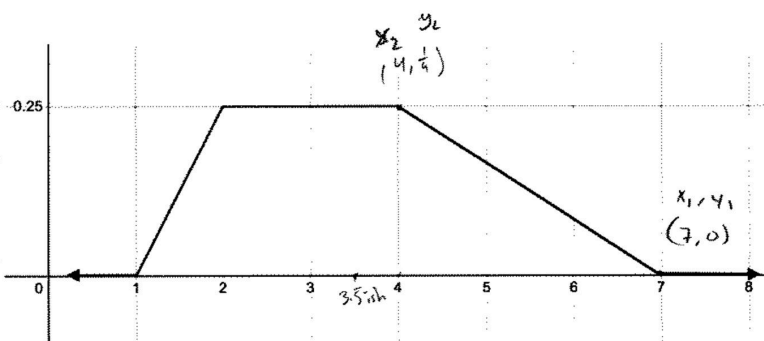
Answer:

256 strings

$$\underline{0}\ \underline{0}\ \underline{0}\ \underline{0}\ \underline{0}\ \underline{0}\ \underline{\ }\ \underline{\ }\ \underline{\ }\ \underline{\ }\ \underline{\ }\ \underline{\ }\ \underline{\ }\ \underline{\ } = 2^8 = 256$$
$$\qquad \qquad 2\ 2\ 2\ 2\ 2\ 2\ 2\ 2$$

$$2^8$$

order no matter

3. (3 pts) Let $y = g(x)$ be the function graphed here:
(you can assume $g(x)$ is 0 for values of x that are less than 1 or greater than 7).

What is the value of $\int\limits_{3.5}^{\infty} g(x)\,dx$?

Determine the answer **without doing any actual integration.**

Put your final answer in the box, as a simplified fraction. *Provide your justification in the space below. Answers without any justification will receive 0 points.*

Answer:

$$\frac{1}{8} + \frac{49}{24} + \frac{36}{12}$$

See back!

3.5 to 4, slope is 0.25

$$\int_{3.5}^{4} 0.25\,dx = 0.25x \Big|_{3.5}^{4} = \left(\frac{1}{4}(4)\right) - \left(\left(\frac{1}{4}\right)\left(\frac{7}{2}\right)\right) = 1 - \frac{7}{8} = \frac{8}{8} - \frac{7}{8} = \frac{1}{8}$$

4 to 7 use point slope $\quad \frac{y_2-y_1}{x_2-x_1} = \frac{\frac{1}{4}-0}{4-7} = \frac{\frac{1}{4}}{-3} = -\frac{1}{12} \quad y-y_1 = m(x-x_1)$

$$y - 0 = -\frac{1}{12}(x-7) \quad \Rightarrow \quad y = -\frac{1}{12}x + \frac{7}{12} \qquad \text{I'm sorry, I don't have a calculator}$$

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4. (2 pts) True or False: Any student can arrange to take the midterms or final at a different time than is scheduled for your section as long as you email Professor Oscamou at least 2 weeks in advance.

○ True
● False

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5. (2 pts) True or False: If you have errors compiling your HW notebook and it won't output a PDF and zip file, you can submit the homework by emailing the notebook to Professor Oscamou before the HW deadline or posting the .ipynb notebook to Piazza before the deadline to receive credit on the HW.

○ True
● False

6. (2 pts)
   How many HW extensions are you granted in this class?

   - ◉ Two 24-hr extensions and two 6 day extensions
   - ○ Two 24-hr extensions and two 7 day extensions
   - ○ Two 24-hr extensions and two 2 week extensions
   - ○ Four 24-hr extensions
   - ○ Four 1 week extensions
   - ○ No HW extensions are allowed

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7. (3 pts) Which of the following are considered violations of the course Academic Honesty policy and will immediately result in an F in the course and a report to the Honor Council?

   Select ALL that apply for full credit.

   - ☐ Asking someone why a particular construct does not work as you expected in a given program.
   - ☑ Using a solution to a CSCI 3022 HW problem found online (or another student's solution) and then editing that solution and submitting it for your HW.
   - ☑ Putting any assigned question from this class into Generative AI and directly using or modifying the output when submitting your answer.
   - ☐ Asking someone (or searching online) how a particular construct in Python works.
   - ☑ Having a cell phone, smartwatch, tablet or other online device anywhere on your body or at your desk during a quiz or exam.
   - ☐ Reading a solution to a CSCI 3022 HW problem found online (or another student's solution) before writing your own solution for that particular problem.
   - ☑ Looking at another student's answers during a quiz or exam and/or collaborating with another student during a quiz or exam.
   - ☑ Attempting to falsify proof that you submitted a HW assignment, quiz or exam that you did not submit.
   - ☐ Working on a HW problem on your own first and then discussing with a classmate a particular part in the problem solution where you are stuck. After clarifying any questions you then continue to write your solution independently.
   - ☑ When doing HW or projects, copying a segment of code solution or math solution of three lines or more from another student.
   - ☑ When doing HW or projects, allowing another student to copy a segment of your code or math solution of three lines or more
   - ☐ Asking someone for help in finding an error in your program.
   - ☐ Asking someone (or searching online) how to formulate a particular construct in Python.
   - ☑ Asking someone to write all or part of a program or solution for you.

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8. (3 pts) What grade adjustments are provided to ALL students at the end of the semester? (Check all that apply)

   - ☐ Drop 2 lowest HW scores
   - ☑ Drop 1 lowest HW score
   - ☑ Drop 2 lowest quiz scores.
   - ☐ Drop 1 lowest quiz score
   - ☐ Drop 3 lowest attendance scores.
   - ☑ Drop 6 lowest attendance scores
   - ☐ One midterm retake or makeup
   - ☐ Highest midterm percentage will replace final exam percentage, if higher
   - ☑ Final exam percentage will replace lowest midterm exam percentage, if higher

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END OF QUIZ

If you finish early please close your quiz and wait until time is up.

$$\frac{\frac{49}{2}}{78}$$

$$\int_{4}^{7} -\frac{1}{12}x + \frac{7}{12}\,dx = \quad -\frac{x^2}{2}\left(\frac{1}{12}\right) + \frac{7}{12}x \,\Big|_{4}^{7} = \quad -\frac{x^2}{24} + \frac{7x}{12}\,\Big|_{4}^{7}$$

$$\left(-\frac{49}{24} + \frac{49}{12}\right) - \left(-\frac{16}{24} + \frac{28}{12}\right) = \quad -\frac{49}{24} + \frac{98}{24} \quad +$$

$$\frac{49}{24} + \frac{8}{12} + \frac{28}{12} = \quad \frac{49}{24} + \frac{36}{12}$$