

# ECS 315: In-Class Exercise

## Instructions

1. Separate into groups of no more than three persons.
2. **The group cannot be the same as your former group.**
3. Only one submission is needed for each group.
4. **Only the answers are needed in this exercise.**
5. **Do not panic.**
6. **Only this page will be scanned and graded. Work only on this page.**

Name	ID

Consider the random variable specified in each part below.

- i) Write down its (minimal) support.
- ii) Write down its pmf.
- iii) Find  $P[X < 1]$
- iv) Find  $P[1 < X \leq 2]$

The RVs in this exercise are all integer-valued and non-negative.

Write the answers for the probability values in the form           .

For example, write 0.5 as 0.5000, write 1/3 as 0.3333.

$p[x=0]$     $p[x=2]$

		Support	pmf $p_X(x) =$	$P[X < 1]$	$P[1 < X \leq 2]$
(a)	$X \sim \text{Uniform}(\{1,2,3,4,5\})$	$\{1,2,3,4,5\}$	$\begin{cases} 1/5, & x \in \{1,2,3,4,5\}, \\ 0, & \text{otherwise.} \end{cases}$	$= 0$ <u>0.0000</u>	$= 1/5$ <u>0.2000</u>
(b)	$X \sim \text{Bernoulli}(\frac{1}{5})$	$\{0,1\}$	$\begin{cases} 1/5, & x = 1, \\ 4/5, & x = 0, \\ 0, & \text{otherwise.} \end{cases}$	$= 4/5$ <u>0.8000</u>	$= 0$ <u>0.0000</u>
(c)	$X \sim \text{Binomial}(5, \frac{1}{5})$	$\{0,1,2,3,4,5\}$	$\begin{cases} \binom{5}{x} (\frac{1}{5})^x (\frac{4}{5})^{5-x}, & x \in \{0,1,2,3,4,5\}, \\ 0, & \text{otherwise.} \end{cases}$	$= (4/5)^5$ <u>0.3277</u>	$= 0.2048$ <u>0.2048</u>

$$\binom{5}{2} \left(\frac{1}{5}\right)^2 \left(\frac{4}{5}\right)^{5-2} = 10 \times \frac{4^3}{5^5}$$