

# Phương pháp nghiên cứu trong khoa học liên ngành

---

**Nguyễn Bích Ngọc**

Khoa các khoa học liên ngành, ĐHQGHN

# Dữ liệu

---

# Dữ liệu

	Gender	Age.Range	Year	Nationality	Q1	Q2	Q3	Q4	Q5	← Biến		
1	Female	20 - 21 years old	Year 4	Thai	7	5	7	7	7			
2	Female	20 - 21 years old	Year 4	Thai	6	5	7	5	6			
3	Female	20 - 21 years old	Year 4	Thai	7	7		year	avg_ice_duration	avg_air_temp_adjusted		
4	Female	20 - 21 years old	Year 4	Thai	7	2	27	1880	160.5	-4.501104972		
5	Female	22 - 23 years old	Year 4	Thai	6	6	28	1881	77.5	1.270718232		
6	Male	20 - 21 years old	Year 3	Thai	5	4	29	1882	125.5	-2.928729282		
7	Male	20 - 21 years old	Year 3	Thai	6	4	30	1883	119.5	-4.179120879		
8	Female	20 - 21 years old	Year 3	Thai	7	4	31	1884	122.5	-6.309944751		
9	Female	20 - 21 years old	Year 3	Thai	7	5	32	1885	129.5	-2.974033149		
10	Male	20 - 21 years old	Year 3	Thai	5	5	33	1886	131.0	-4.986740331		
11	Female	20 - 21 years old	Year 3	Thai	7	5	34	1887	125.0	-4.989560440		
							35	1888	87.5	-1.082320442		
							36	1889	74.5	-0.719337017		
							37	1890	112.0	-1.234806630		

↑  
Đối tượng quan sát

# Biến

- Các loại biến

- Định danh (nominal)

- Thứ bậc (ordinal)

- Liên tục/Định lượng (continuous)



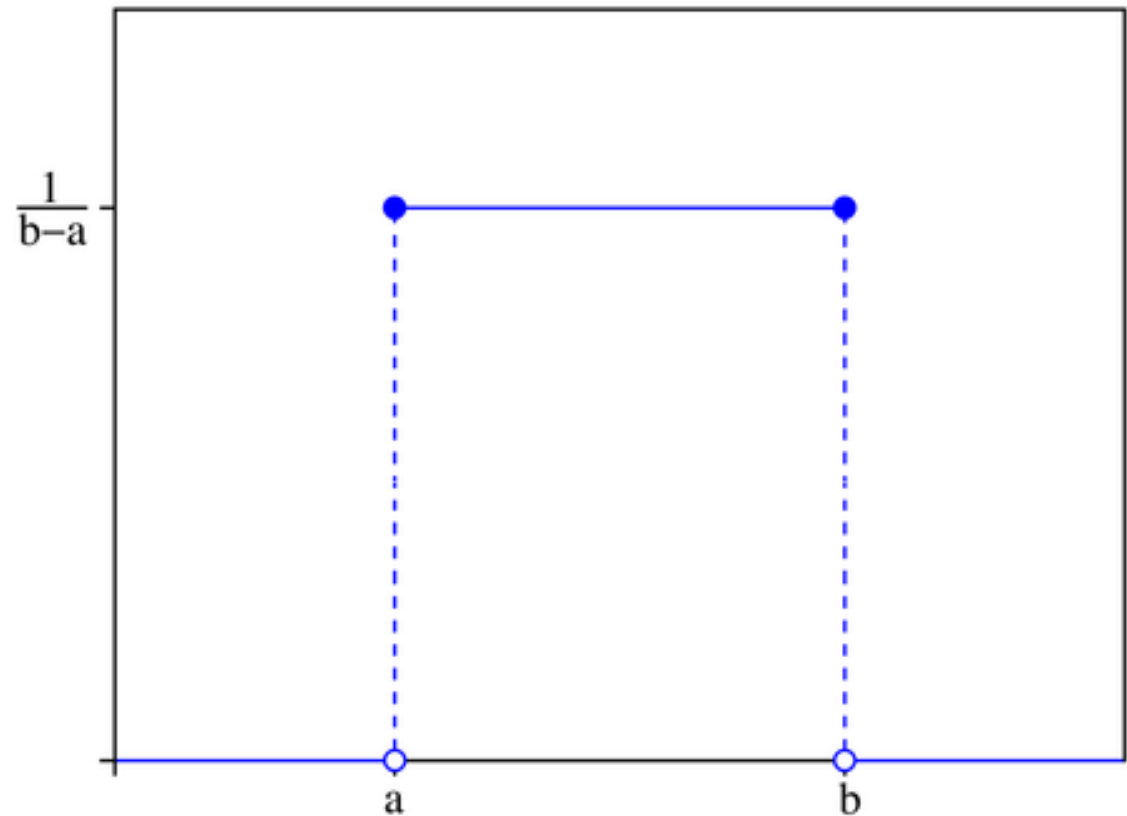
Biến gián đoạn/định tính

# Bài tập

	A	B	C	D	E	F	G	H
1	id	csmptv	rwtank	iceqac2	dwltyp	livara	nbbdrm	cfdiwq
2	5	74	no	NA	2 facades	58	1	suspicious
3	29	131	yes	modest	2 facades	100	2	neither confident nor suspicious
4	34	102.08	yes	average	4 facades	200	2	neither confident nor suspicious
5	36	71	no	precarious	apartment/studio	70	2	rather confident
6	37	40	no	NA	2 facades	58	1	rather confident
7	39	39.16	no	modest	2 facades	100	3 or more	confident
8	42	115	no	modest	2 facades	200	2	confident
9	44	NA	yes	higher	4 facades	150	3 or more	rather confident
10	45	NA	yes	precarious	4 facades	150	3 or more	confident
11	46	119.57	no	modest	3 facades	150	3 or more	rather confident
12	47	97	no	average	2 facades	90	3 or more	neither confident nor suspicious
13	48	82.6	yes	modest	4 facades	200	3 or more	rather suspicious
14	50	38	yes	modest	4 facades	130	3 or more	confident
15	51	NA	no	NA	apartment/studio	90	1	confident
16	53	162.56	no	modest	4 facades	160	3 or more	confident
17	54	15.27	yes	modest	4 facades	121	2	confident
18	55	71.57	no	precarious	apartment/studio	50	1	no opinion
19	56	42	no	modest	3 facades	102	2	confident
20	57	141.36	no	modest	2 facades	105	3 or more	confident
21	58	77	no	average	apartment/studio	90	2	rather suspicious

# Phân phối biến định lượng

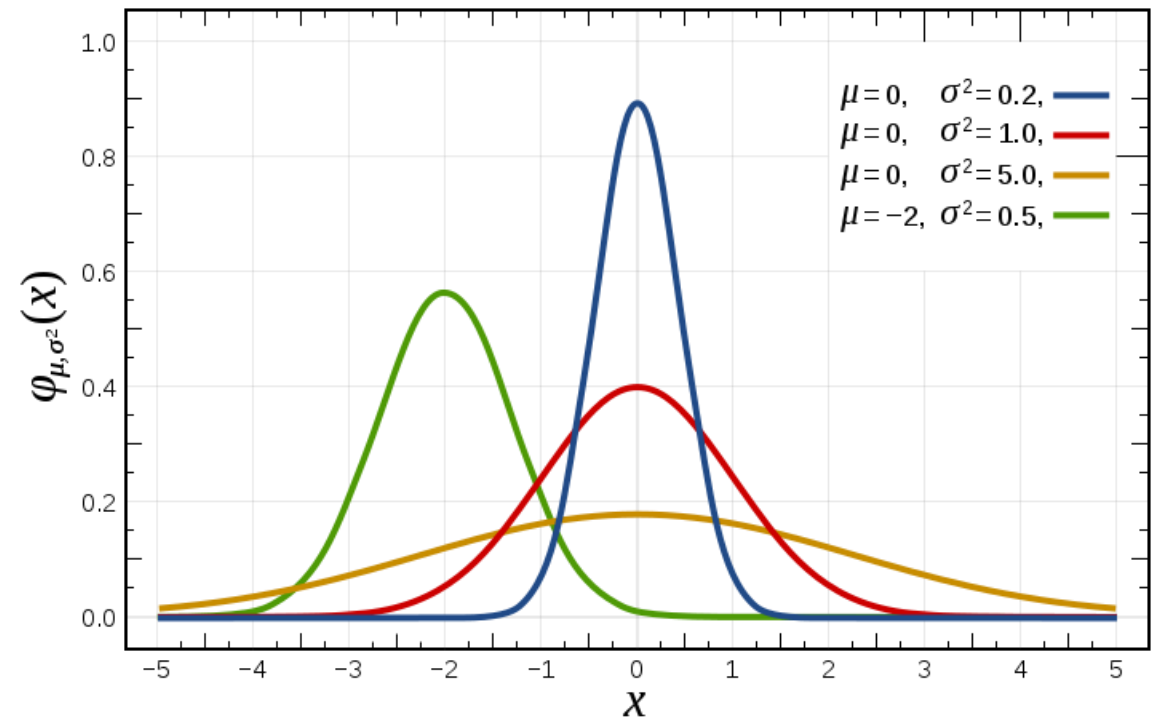
- Phân phối đồng nhất (uniform distribution)



# Phân phối biến định lượng

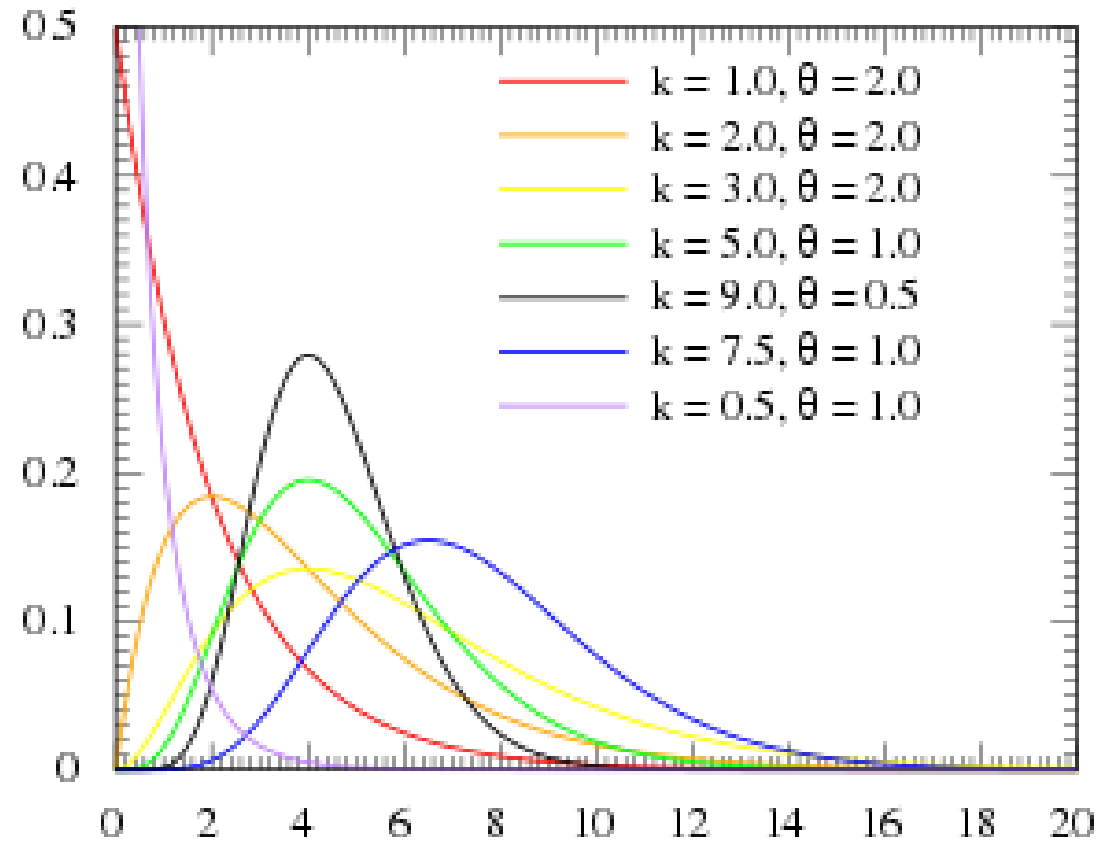
- Phân phối đồng nhất (Uniform distribution)

- Phân phối chuẩn  $N(\mu, \sigma^2)$   
(Normal distribution)  
Phân phối chuẩn tắc  $N(0,1)$   
(Standard normal distribution)



# Phân phối biến định lượng

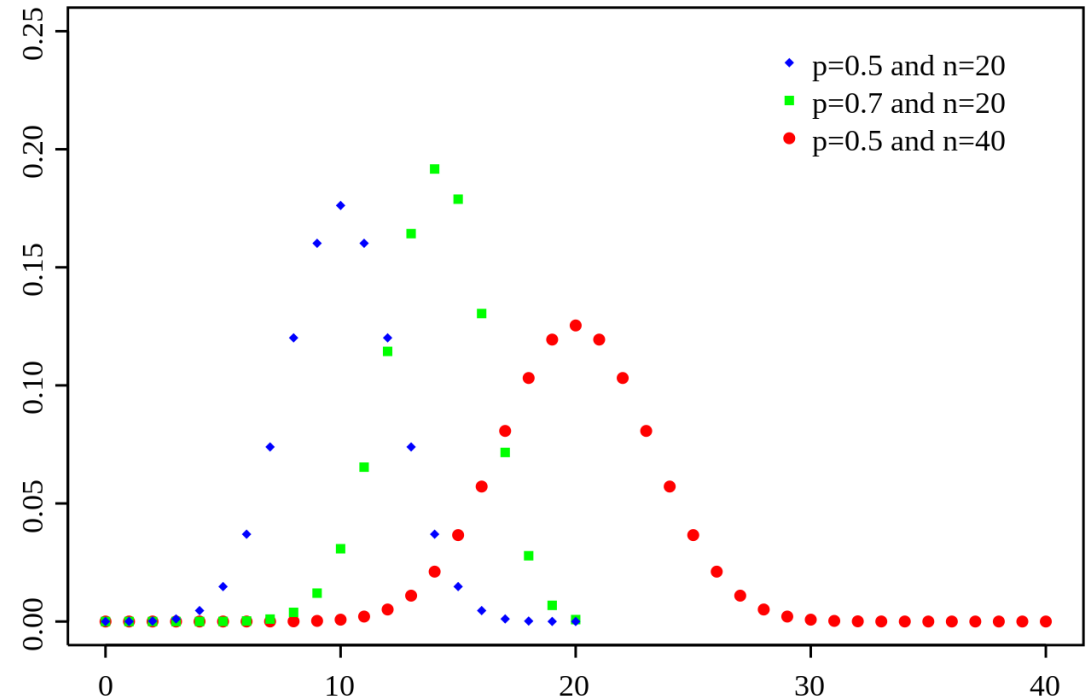
- Phân phối đồng nhất (Uniform distribution)
- Phân phối chuẩn  $N(\mu, \sigma^2)$   
(Normal distribution)  
Phân phối chuẩn tắc  $N(0,1)$   
(Standard normal distribution)
- Phân phối Gamma  
(Gamma distribution)





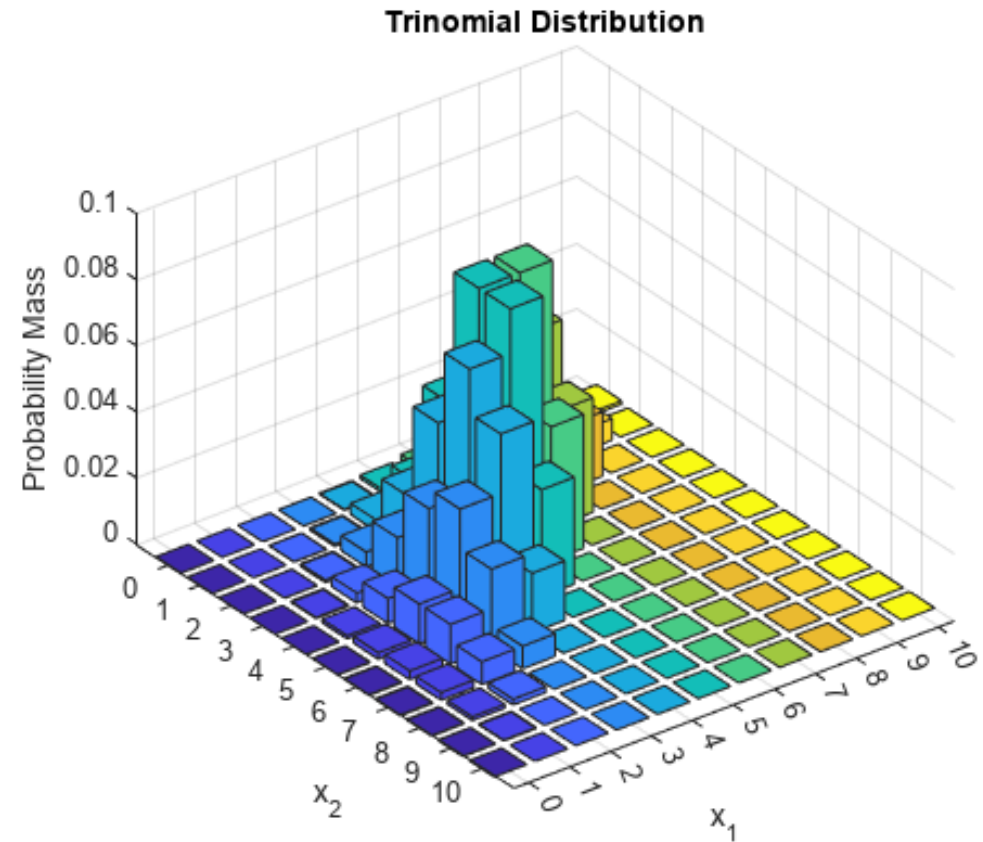
# Phân phối biến gián đoạn

- Phân phối biến nhị phân  $B(n, p)$



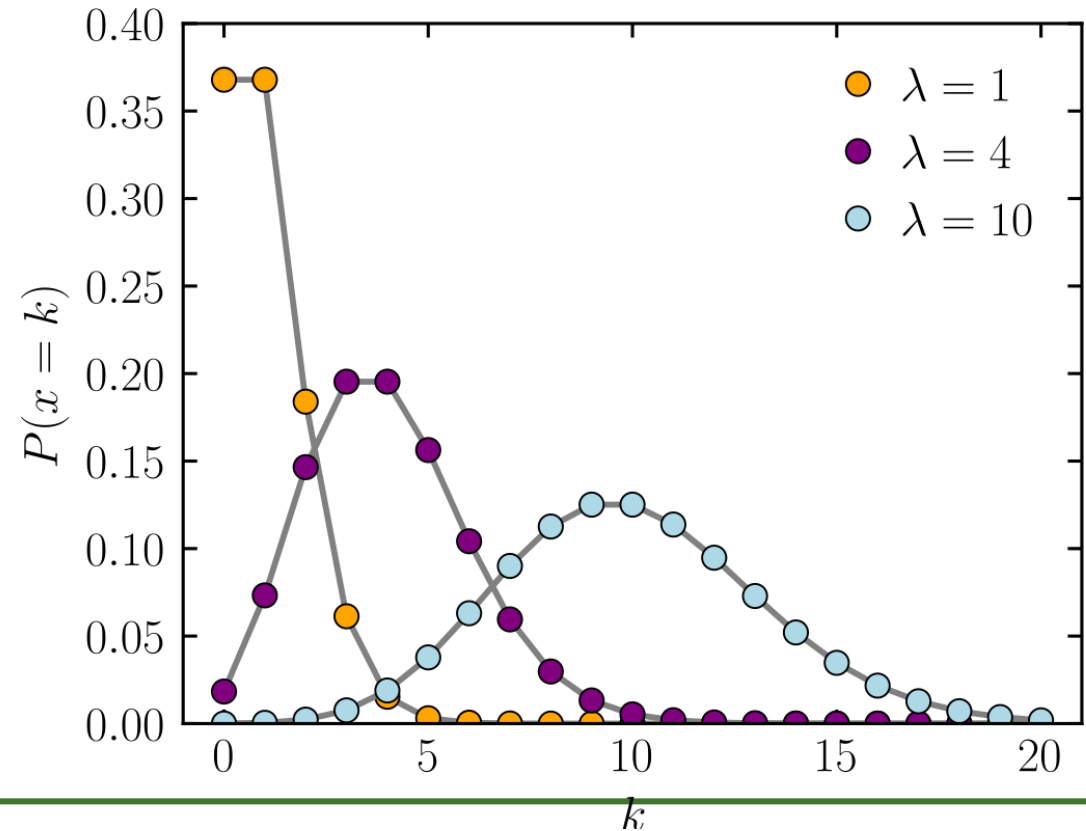
# Phân phối biến gián đoạn

- Phân phối biến nhị phân  $B(n, p)$
- Phân phối đa thức



# Phân phối biến đếm

- Phân phối biến nhị phân  $B(n, p)$
- Phân phối đa thức
- Phân phối Poisson  $Pois(\lambda)$



# Bài tập

	A	B	C	D	E	F	G	H
1	id	csmptv	rwtank	iceqac2	dwltyp	livara	nbbdrm	cfdiwq
2	5	74	no	NA	2 facades	58	1	suspicious
3	29	131	yes	modest	2 facades	100	2	neither confident nor suspicious
4	34	102.08	yes	average	4 facades	200	2	neither confident nor suspicious
5	36	71	no	precarious	apartment/studio	70	2	rather confident
6	37	40	no	NA	2 facades	58	1	rather confident
7	39	39.16	no	modest	2 facades	100	3 or more	confident
8	42	115	no	modest	2 facades	200	2	confident
9	44	NA	yes	higher	4 facades	150	3 or more	rather confident
10	45	NA	yes	precarious	4 facades	150	3 or more	confident
11	46	119.57	no	modest	3 facades	150	3 or more	rather confident
12	47	97	no	average	2 facades	90	3 or more	neither confident nor suspicious
13	48	82.6	yes	modest	4 facades	200	3 or more	rather suspicious
14	50	38	yes	modest	4 facades	130	3 or more	confident
15	51	NA	no	NA	apartment/studio	90	1	confident
16	53	162.56	no	modest	4 facades	160	3 or more	confident
17	54	15.27	yes	modest	4 facades	121	2	confident
18	55	71.57	no	precarious	apartment/studio	50	1	no opinion
19	56	42	no	modest	3 facades	102	2	confident
20	57	141.36	no	modest	2 facades	105	3 or more	confident
21	58	77	no	average	apartment/studio	90	2	rather suspicious

# Bài tập

	A	B	C	D	E	F	G	H
1	id	csmptv	rw tank	iceqac2	dwltyp	livara	nbbdrm	cf diwq
2	5	74	no	NA	2 facades	58	1	suspicious
3	29	131	yes	modest	2 facades	100	2	neither confident nor suspicious
4	34	102.08	yes	average	4 facades	200	2	neither confident nor suspicious
5	36	71	no	precarious	apartment/studio	70	2	rather confident
6	37	40	no	NA	2 facades	58	1	rather confident
7	39	39.16	no	modest	2 facades	100	3 or more	confident
8	42	115	no	modest	2 facades	200	2	confident
9	44	NA	yes	higher	4 facades	150	3 or more	rather confident
10	45	NA	yes	precarious	4 facades	150	3 or more	confident
11	46	119.57	no	modest	3 facades	150	3 or more	rather confident
12	47	97	no	average	2 facades	90	3 or more	neither confident nor suspicious
13	48	82.6	yes	modest	4 facades	200	3 or more	rather suspicious
14	50	38	yes	modest	4 facades	130	3 or more	confident
15	51	NA	no	NA	apartment/studio	90	1	confident
16	53	162.56	no	modest	4 facades	160	3 or more	confident
17	54	15.27	yes	modest	4 facades	121	2	confident
18	55	71.57	no	precarious	apartment/studio	50	1	no opinion
19	56	42	no	modest	3 facades	102	2	confident
20	57	141.36	no	modest	2 facades	105	3 or more	confident
21	58	77	no	average	apartment/studio	90	2	rather suspicious