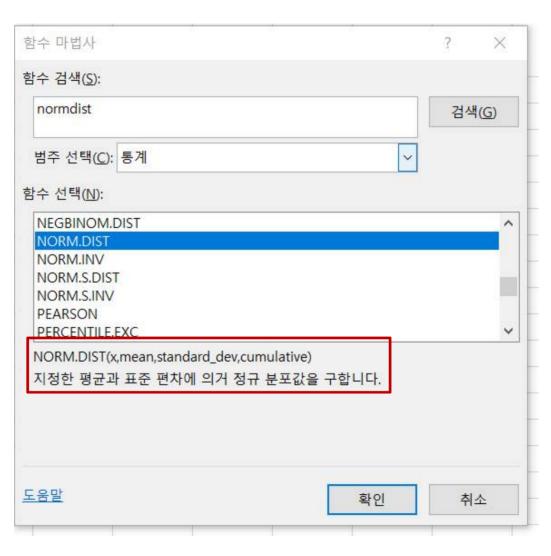
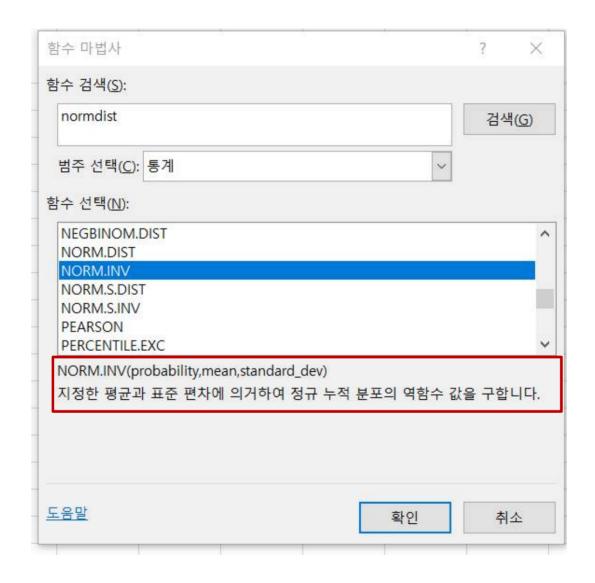
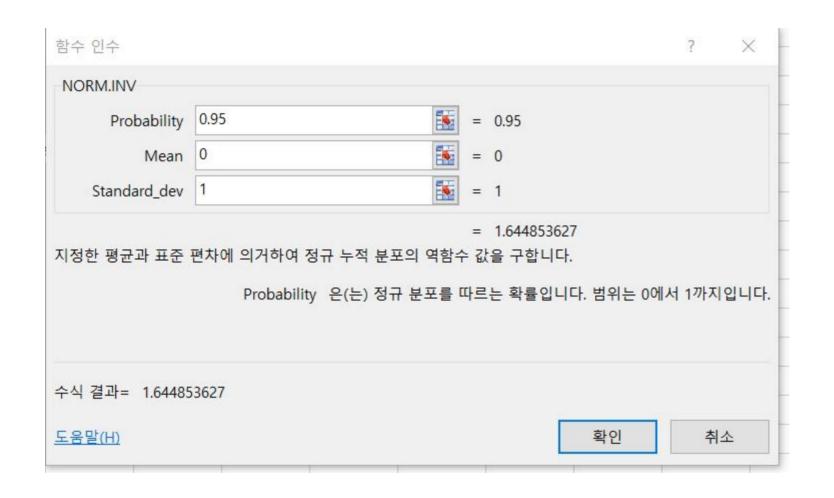
The Normal Distribution

Excel: 수식 > 함수 > 통계



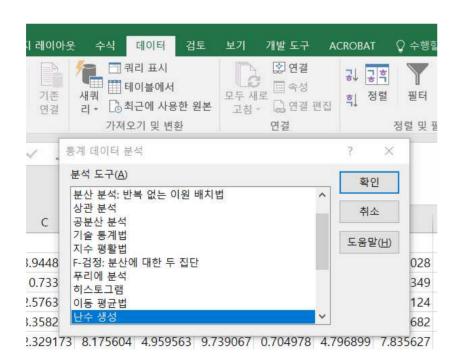
함수 인수						?	×
NORM.DIST							
Х	1.0	=	= 1				
Mean	0	=	= 0				
Standard_dev	1	=	= 1				
Cumulative	false	=	= FALSE				
지정한 평균과 표준 편차에	의거 정규 분포값을 구합니다. Cumulative 은(는) 함수의 형태를 FALSE이면 확률 밀도			니다. TRU	JE이면	누적 분	포 <mark>함</mark> 수,
수식 결과= 0.241970725							
도움말(H)				확인	AT.	+	소

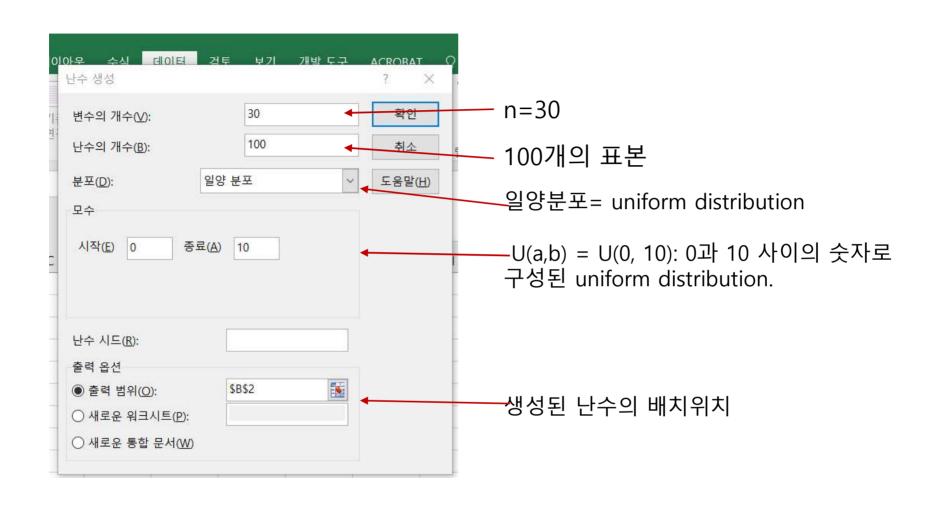




The Central Limit Theorem(CLT)

- Generate 100 samples of size n=30 from a continuous uniform distribution over the interval (0, 10).
- Excel
 - (1) A1 column 에 "Sample" 적고, A2 ~ A101 에 1~100 번호 입력
 - (2) 데이터 > 데이터 분석 > 난수 생성



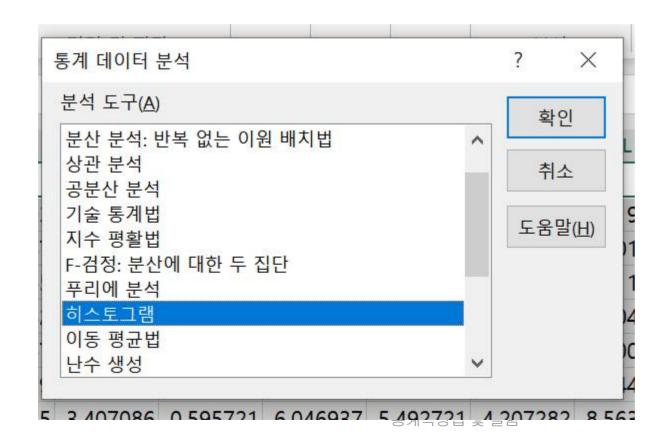


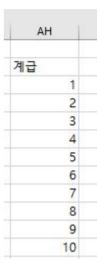
Α	В	C	D	E	F	G		Н		1					
amp <mark>le</mark>															
1	7.655568	5.690481	3.934446	2.250435	2.878811	5.0978	812 8.6	24836	5.00	7782					
2	9.851375	3.36436	6.360973	3.926511	5.076144	4.5551	93 8.9	30631	7.57	76525					
3	4.787744	7.292093	1.364483	9.562365	3.211768	4.0736	511 1.4	41694	4 8.317209						
4	6.90054	6.830348	9.760125	9.429914	0.193487	8.1286	0.0	07324	3.23	34046					
5	3.46324	0.305185	7.998291	4.26252	0.443434	2.9691	46 9.2	12622	12622 2.942						
6	8.092898	1.806391	5.871456	7.877132	4.799951	3.5859	25 8.4	42335	335 5.598621						
7	8.176519	0.266121	5.170446	3.513291	4.588763	2.2446	36 4.	.04706	of 7.078 <mark>4</mark> 63						
8	4.651936	3.054292	0.113834	8.905911	7.302774	8.7478	326 6.6	48457	4.80	06665					
9	2.815027	5.544603	2.671285	8.251595	6.912442	0.8722	219 5.7	22221	6.31	11228					
10	9.810175	7.200842	8.638264	0.971709	6.604511	9.0865	6.81	.66036	4.40	01074					
11	4.391614	4.903409	9.809259	8.750877	7.000336	3.8804	2.8	01294	9.00	09369					
12	3.71868	6.754051	0.02533	5.007172	4.886929	8.1322	267 2.6	69149	2.46	55896					
13	6.555681	5.709708	4.540239	5.981323	2.424085	2.1021	15 7.1	35228	1.56	57736	AA	AB	AC	AD	AE
14															
15	0 08179	1 218909	5 352336	4 709922									THE RESERVE OF THE PARTY OF THE	NAME OF THE PARTY	6.680502
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								100115-00000	A 1500 THE REAL PROPERTY.		And the state of t		40000000000000000000000000000000000000		AND THE RESERVE THE PARTY OF TH
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					200 Ad. 600 C	10701201201		\$7000F0.5E0057			DIA SERVICE ACTION OF THE SERVICE			1-099 8035-9150 86	March Stranger of the
						Company Company		And the American			or an analysis as a second			5777-0-707-0-707-0-70	PST-9F-507AW-DRGUARY
					\$4500.04E	17.52		2001-2000	2000-200						SASSAUM ELA
								25.02522	-1054.5						3.335978
					576(2672)/7029	NEW YORK	WALL TO STORY	A-5-5-8-2-18-18-	10-00-00-		TOTAL CONTRACTOR OF THE PARTY O		Average and the second	SUBSTITUTE OF STREET	5.21836
	1 2 3 4 5 6 7 8 9 10 11 12 13	1 7.655568 2 9.851375 3 4.787744 4 6.90054 5 3.46324 6 8.092898 7 8.176519 8 4.651936 9 2.815027 10 9.810175 11 4.391614 12 3.71868 13 6.555681 14 8.613849	1 7.655568 5.690481 2 9.851375 3.36436 3 4.787744 7.292093 4 6.90054 6.830348 5 3.46324 0.305185 6 8.092898 1.806391 7 8.176519 0.266121 8 4.651936 3.054292 9 2.815027 5.544603 10 9.810175 7.200842 11 4.391614 4.903409 12 3.71868 6.754051 13 6.555681 5.709708 14 8.613849 3.361919	1 7.655568 5.690481 3.934446 2 9.851375 3.36436 6.360973 3 4.787744 7.292093 1.364483 4 6.90054 6.830348 9.760125 5 3.46324 0.305185 7.998291 6 8.092898 1.806391 5.871456 7 8.176519 0.266121 5.170446 8 4.651936 3.054292 0.113834 9 2.815027 5.544603 2.671285 10 9.810175 7.200842 8.638264 11 4.391614 4.903409 9.809259 12 3.71868 6.754051 0.02533 13 6.555681 5.709708 4.540239 14 8.613849 3.361919 9.270608	1 7.655568 5.690481 3.934446 2.250435 2 9.851375 3.36436 6.360973 3.926511 3 4.787744 7.292093 1.364483 9.562365 4 6.90054 6.830348 9.760125 9.429914 5 3.46324 0.305185 7.998291 4.26252 6 8.092898 1.806391 5.871456 7.877132 7 8.176519 0.266121 5.170446 3.513291 8 4.651936 3.054292 0.113834 8.905911 9 2.815027 5.544603 2.671285 8.251595 10 9.810175 7.200842 8.638264 0.971709 11 4.391614 4.903409 9.809259 8.750877 12 3.71868 6.754051 0.02533 5.007172 13 6.555681 5.709708 4.540239 5.981323 14 8.613849 3.361919 9.270608 1.218604	1 7.655568 5.690481 3.934446 2.250435 2.878811 2 9.851375 3.36436 6.360973 3.926511 5.076144 3 4.787744 7.292093 1.364483 9.562365 3.211768 4 6.90054 6.830348 9.760125 9.429914 0.193487 5 3.46324 0.305185 7.998291 4.26252 0.443434 6 8.092898 1.806391 5.871456 7.877132 4.799951 7 8.176519 0.266121 5.170446 3.513291 4.588763 8 4.651936 3.054292 0.113834 8.905911 7.302774 9 2.815027 5.544603 2.671285 8.251595 6.912442 10 9.810175 7.200842 8.638264 0.971709 6.604511 11 4.391614 4.903409 9.809259 8.750877 7.000336 12 3.71868 6.754051 0.02533 5.007172 4.886929 13 6.555681 5.709708 4.540239 5.981323 2.424085	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.0978 2 9.851375 3.36436 6.360973 3.926511 5.076144 4.5551 3 4.787744 7.292093 1.364483 9.562365 3.211768 4.0736 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.1286 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.9691 6 8.092898 1.806391 5.871456 7.877132 4.799951 3.5859 7 8.176519 0.266121 5.170446 3.513291 4.588763 2.2446 8 4.651936 3.054292 0.113834 8.905911 7.302774 8.7478 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.8722 10 9.810175 7.200842 8.638264 0.971709 6.604511 9.0853 11 4.391614 4.903409 9.809259 8.750877 7.000336 3.8804 12 3.71868 6.754051	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.097812 8.6 2 9.851375 3.36436 6.360973 3.926511 5.076144 4.555193 8.9 3 4.787744 7.292093 1.364483 9.562365 3.211768 4.073611 1.4 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.128605 0.0 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.969146 9.2 6 8.092898 1.806391 5.871456 7.877132 4.799951 3.585925 8.4 7 8.176519 0.266121 5.170446 3.513291 4.588763 2.244636 4 8 4.651936 3.054292 0.113834 8.905911 7.302774 8.747826 6.6 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.7 10 9.810175 7.200842 8.638264 0.971709 6.604511 9.086581 6 11 4.391614	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.097812 8.624836 2 9.851375 3.36436 6.360973 3.926511 5.076144 4.555193 8.930631 3 4.787744 7.292093 1.364483 9.562365 3.211768 4.073611 1.441694 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.128605 0.007324 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.969146 9.212622 6 8.092898 1.806391 5.871456 7.877132 4.799951 3.585925 8.442335 7 8.176519 0.266121 5.170446 3.513291 4.588763 2.244636 4.04706 8 4.651936 3.054292 0.113834 8.905911 7.302774 8.747826 6.648457 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.722221 10 9.810175 7.200842 8.638264 0.971709 6.604511 9.08581 6.66036	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.097812 8.624836 5.00 2 9.851375 3.36436 6.360973 3.926511 5.076144 4.555193 8.930631 7.57 3 4.787744 7.292093 1.364483 9.562365 3.211768 4.073611 1.441694 8.31 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.128605 0.007324 3.23 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.969146 9.212622 2 6 8.092898 1.806391 5.871456 7.877132 4.799951 3.585925 8.442335 5.55 7 8.176519 0.266121 5.170446 3.513291 4.588763 2.244636 4.04706 7.07 8 4.651936 3.054292 0.113834 8.905911 7.302774 8.747826 6.648457 4.80 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.722221 6.31 10	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.097812 8.624836 5.007782 2 9.851375 3.36436 6.360973 3.926511 5.076144 4.555193 8.930631 7.576525 3 4.787744 7.292093 1.364483 9.562365 3.211768 4.073611 1.441694 8.317209 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.128605 0.007324 3.234046 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.969146 9.212622 2.9429 6 8.092898 1.806391 5.871456 7.877132 4.799951 3.585925 8.442335 5.598621 7 8.176519 0.266121 5.170446 3.513291 4.588763 2.244636 4.04706 7.078463 8 4.651936 3.054292 0.113834 8.905911 7.302774 8.747826 6.648457 4.806665 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.722221 6.311228	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.097812 8.624836 5.007782 2 9.851375 3.36436 6.360973 3.926511 5.076144 4.555193 8.930631 7.576525 3 4.787744 7.292093 1.364483 9.562365 3.211768 4.073611 1.441694 8.317209 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.128605 0.007324 3.234046 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.969146 9.212622 2.9429 6 8.092898 1.806391 5.871456 7.877132 4.799951 3.585925 8.442335 5.598621 7 8.176519 0.266121 5.170446 3.513291 4.588763 2.244636 4.04706 7.078463 8 4.651936 3.054292 0.113834 8.905911 7.302774 8.747826 6.648457 4.806665 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.722221 6.311228	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.097812 8.624836 5.007782 2 9.851375 3.36436 6.360973 3.926511 5.076144 4.555193 8.930631 7.576525 3 4.787744 7.292093 1.364483 9.562365 3.211768 4.073611 1.441694 8.317209 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.128605 0.007324 3.234046 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.969146 9.212622 2.9429 6 8.092898 1.806315 5.871456 7.877132 4.799951 3.585925 8.442335 5.598621 7 8.176519 0.266121 5.170446 3.513291 7.302774 8.747826 6.648457 4.806665 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.722221 6.311228 10 9.810175 7.200842 8.63264 0.971709 6.604511 9.086581 6.66036 4.401074	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.076124 4.555193 8.930631 7.576525 3.36436 6.360973 3.926511 5.076144 4.555193 8.930631 7.576525 4.8787744 7.292093 1.364483 9.562365 3.211768 4.073611 1.441694 8.317209 4.690054 6.830348 9.760125 9.429914 0.193487 8.128605 0.007324 3.234046 5.346324 0.305185 7.998291 4.26252 0.434343 2.969146 9.212622 2.9429 6.8092898 1.806391 5.871456 7.877132 4.799951 3.585925 8.442335 5.958621 7.8176519 0.266121 5.170446 3.513291 4.588763 2.244636 4.04706 7.078463 8.4651936 3.054292 0.113834 8.905911 7.302774 8.747826 6.648457 4.806665 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.722221 6.311228 10 9.810175 7.200842 8.638264 0.971709 6.604511 9.086581 6.66036 4.401074 4.903409 9.890259 8.750877 7.000336 3.880428 2.801294 9.009369 12 3.71868 6.75051 0.02533 5.007172 4.886929 8.132267 2.669149 2.465896 13 6.555681 5.709708 4.540239 5.981223 2.424085 2.102115 7.135228 1.567736 AA AB AC 14 8.613849 3.361919 9.270608 1.218604 0.957366 6.17542 8.660237 7.470626 15 0.08139 3.94555 7.723014 3.295694 4.527116 4.751732 4.015625 0.988272 5.74143 9.45555 7.723014 3.295694 4.527116 4.751732 4.015625 0.988272 5.74248 8.86654 3.020722 8.287301 0.910062 9.490036 9.0056701 6.855983 1.866654 3.020722 8.287301 0.910062 9.490036 4.264351 0.738548 4.936064 0.679342 3.670461 3.346049 5.43900 9.605701 6.855983 1.886654 3.020722 8.287301 0.910062 9.490036 4.264351 0.738548 4.936064 0.679342 3.670461 3.346049 5.43900 9.605701 6.855983 9.398275 4.848643 5.757927 2.893765 5.482345 0.059091 9.207007 3.93205 4.481643 5.757927 2.893765 5.482345 0.059091 9.207017 3.93205 4.481643 5.757927 2.893765 5.482345 0.059091 9.207017 3.93205 4.481643 5.757927 2.893765 5.482345 0.059091 1.300549 0.91062 9.10062 9.1	1 7.655568 5.690481 3.934446 2.250435 2.878811 5.097812 8.624836 5.007782 9.851375 3.36436 6.360973 3.926511 5.076144 4.555193 8.930631 7.576525 3.467744 7.292093 1.364483 9.56265 3.211768 4.073611 1.441694 8.317209 4 6.90054 6.830348 9.760125 9.429914 0.193487 8.128605 0.007324 8.234046 5 3.46324 0.305185 7.998291 4.26252 0.443434 2.969146 9.212622 2.9429 6 8.092898 1.806391 5.871456 7.877132 4.799951 3.585925 8.442335 5.598621 7 8.176519 0.266121 5.170446 3.513291 4.588763 2.244636 4.04706 7.078463 8 4.651936 3.054292 0.113834 8.995911 7.302774 8.747826 6.648457 4.806665 9 2.815027 5.544603 2.671285 8.251595 6.912442 0.872219 5.72221 6.631228 9.810175 7.200842 8.638264 0.971709 6.604511 9.086581 6.66036 4.04074 9.809369 9.809529 8.750877 7.000336 3.88048 2.801294 9.009369 9.809541 14 4.391614 4.903409 9.809559 8.750877 7.000336 3.88048 2.801294 9.009369 9.809541 9.309369 9.809549 9.809369 9.809549 9.809369 9.809549 9.809369 9.809549 9.809369 9.809549 9.809369

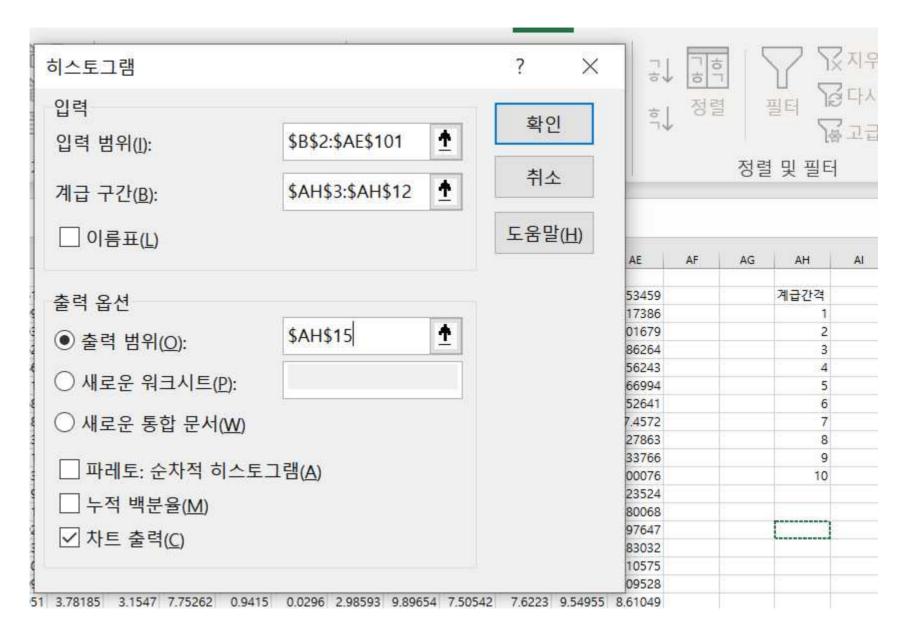
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 8.882107
 4.543596
 1.47618
 2.221442
 0.468154
 3.945128
 4.873196
 4.980316

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 1.560717
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 7.28721
 5.359661

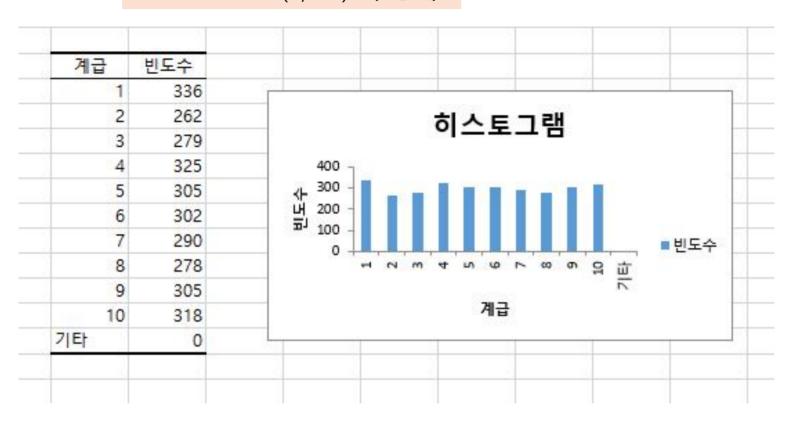
- Uniform dist 전체 분포 체크
- 난수로 생성된 전체 자료의 히스토그램 생성
- 계급구간을 1, 2, 3, ... 10 으로 설정
- 데이터 분석에서 히스토그램 선택







Uniform dist.(0, 10) 의 형태



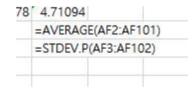
• 30*100= 3000 개 자료의 평균과 표준편차 계산

전체평균=	=AVERAGE(B2:AF101)
전체 sd =	=STDEV.P(B2:AF101)

• 각 행(row) n=30 개 자료의 평균을 계산

AD	AE	AF	AG	А
.84848	9.53459	=average	(B2:AE2)	계급
.38893	9.17386		1	
90658	0.01679			

- 모든 행에 대해 복사 : 100개 표본세트에 대해 평균값 계산
- 100개 표본세트 평균에 대한 평균과 오차(표준오차)를 계산



- 평균값은 전체집단의 평균값과 동일하고 표준오차는 전체표준편차 $/\sqrt{n}$ 과 유사 함

• 100개의 평균에 대한 히스토그램 작성 – 정규분포에 유사

