11. Quiz

Binomial Distribution [1]

- Binomial Distribution Probability
 - Ex1-1
 - 어느 프로야구팀의 투수 A는 삼진을 잡을 확률이 0.2 이다. 투수 A가 선발 출전한 경기에서 5회 동안 20 명의 타자를 상대하였다.
 - 1) 투수 A 가 삼진을 5개 잡을 확률?



Binomial Distribution [2]

- Binomial Distribution Probability
 - Ex1-2
 - 어느 프로야구팀의 투수 A는 삼진을 잡을 확률이 0.2 이다. 투수 A가 선발 출전한 경기에서 5회 동안 20 명의 타자를 상대하였다.
 - 2) 투수 A 가 삼진을 5개 이하 잡을 확률?



Binomial Distribution [3]

- Binomial Distribution Probability
 - Ex1-3
 - 평균과 분산?

```
Number_s = 5
Trials = 20
Probability_s= 0.2
Cumulative= False

Binomial Ditribution Probability
= 0.174559522

Mean of Binomial Ditribution
= 4
Variance of Binomial Ditribution
= 3.2
계속하려면 아무 키나 누르십시오 . . .
```

```
Number_s = 5
Trials = 20
Probability_s= 0.2
Cumulative= True

Binomial Ditribution Probability
= 0.804207785

Mean of Binomial Ditribution
= 4
Variance of Binomial Ditribution
= 3.2
계속하려면 아무 키나 누르십시오 . . .
```

Binomial Distribution [4]

- Binomial Distribution Probability
 - Ex2) 공정한 동전을 8번 던질 때, 꼭 1번 앞면이 나올 확률



Binomial Distribution ^[6]

- Binomial Distribution Probability
 - Ex2) 공정한 동전을 8번 던질 때, 많아야 4번 앞면이 나올 확률



Binomial Distribution [6]

- Binomial Distribution Probability
 - Ex2) 평균과 분산

```
Number_s = 1
Trials = 8
Probability_s= 0.5
Cumulative= False
Binomial Ditribution Probability
= 0.031250000
Mean of Binomial Ditribution
= 4
Variance of Binomial Ditribution
= 2
계속하려면 아무 키나 누르십시오 . . .
```

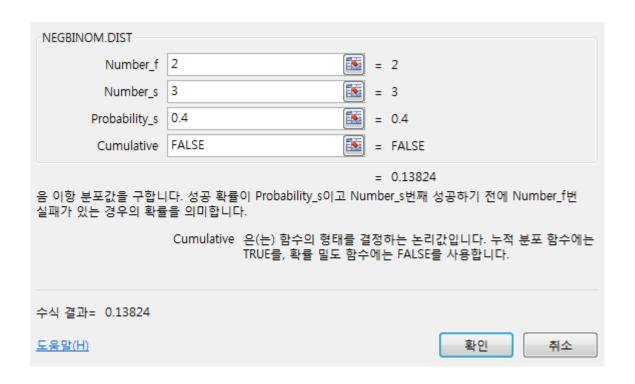
```
Number_s = 4
Trials = 8
Probability_s= 0.5
Cumulative= True

Binomial Ditribution Probability
= 0.636718750

Mean of Binomial Ditribution
= 4
Variance of Binomial Ditribution
= 2
계속하려면 아무 키나 누르십시오 . . .
```

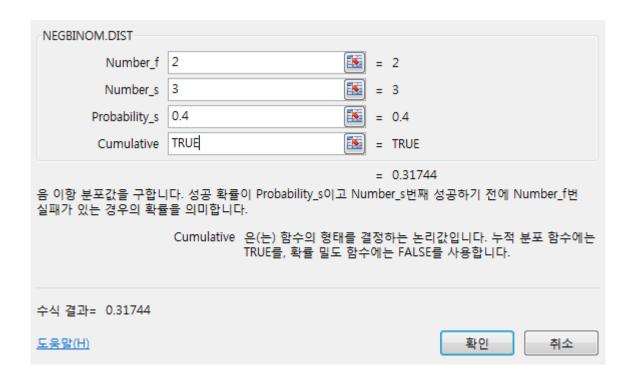
Negative Binomial Distribution ^[5]

- Negative Binomial Distribution Probability
 - Ex1) A와 B팀이 연속해서 경기를 벌인다고 가정하자. 이때 A 팀이 승리할 확률이
 0.4라면 5번째 경기에서 3번째로 이길 확률은?



Negative Binomial Distribution ^[6]

- Negative Binomial Distribution Probability
 - Ex2)



Negative Binomial Distribution ^[6]

- Negative Binomial Distribution Probability
 - Ex3) 평균과 분산?

```
Number_f = 2
Number_s = 3
Probability_s= 0.4
Cumulative= False
Negative Binomial Ditribution Probability
= 0.138240000
Mean of Negative Binomial Ditribution
= 7.5
Variance of Negative Binomial Ditribution
= 11.25
계속하려면 아무 키나 누르십시오 . . .
```

```
Number_f = 2
Number_s = 3
Probability_s= 0.4
Cumulative= True
Negative Binomial Ditribution Probability
= 0.317440000
Mean of Negative Binomial Ditribution
= 7.5
Variance of Negative Binomial Ditribution
= 11.25
계속하려면 아무 키나 누르십시오 . . .
```

Implementations [1]

Binomial Distribution Declarations and Prototypes

```
#ifndef BOOL
typedef int BOOL;
#define FALSE 0
#define TRUE !FALSE
#endif

static double ComputeFactorial(const double f);
static double ComputePermutation(const double n, const double r);
static double ComputeCombination(const double n, const double r);
static double ComputeBinomialDist(const double success, const double trial, const double prob,
const BOOL cumulative);
static double ComputeMeanBinomialDist(const double trial, const double prob);
static double ComputeVarBinomialDist(const double trial, const double prob);
```

Implementations [2]

Negative Binomial Distribution Declarations and Prototypes

```
#ifndef BOOL
typedef int BOOL;
#define FALSE 0
#define TRUE !FALSE
#endif

static double ComputeFactorial(const double f);
static double ComputePermutation(const double n, const double r);
static double ComputeCombination(const double n, const double r);
static double ComputeNegativeBinomialDist(const double failure, const double success, const double prob, const BOOL cumulative);
static double ComputeMeanNegativeBinomialDist(const double success, const double prob);
static double ComputeVarNegativeBinomialDist(const double success, const double prob);
```