# Pomůcka pro přednášku: 3. semestr Bc studia

**Statistika - testy hypotéz**

# Testy hypotéz o parametrech dvou náhodných výběrů z normálních rozdělení

### balíček: Statistics[TwoSampleFTest] - apply the two sample F-test for population variances

TwoSampleFTest (X1, X2, beta, options) provede Fisherův-Snedecorův F-test. Testuje se shodnost rozptylů.

### balíček: Statistics[TwoSampleTTest] - apply the two sample t-test for population means

TwoSampleTTest (X1, X2, beta, options) provede Studentův t-test. Testuje se shodnost středních hodnot.

```
> with(Statistics):
> data4:=[63,154,125,90,105,68,160,76,73,88,92,104,102,120];
data5:=[64,59,70,60,97,84,135,125,70,142];
```

$$data4 := [63, 154, 125, 90, 105, 68, 160, 76, 73, 88, 92, 104, 102, 120]$$

$$data5 := [64, 59, 70, 60, 97, 84, 135, 125, 70, 142]$$

```
> mi_1:=Mean(data4); sigma_1:=StandardDeviation(data4);
```

$$mi\_1 := 101.4285714$$

$$sigma\_1 := 29.8243944698716$$

```
> mi_2:=Mean(data5); sigma_2:=StandardDeviation(data5);
```

$$mi\_2 := 90.60000000$$

$$sigma\_2 := 32.2703854606321$$

```
> ChiSquareSuitableModelTest(data4, Normal(mi_1,sigma_1));
```

$$hypothesis = true, criticalvalue = 7.814728288, distribution = ChiSquare(3), pvalue = 0.4291227918, statistic = 2.766028572$$

```
> ChiSquareSuitableModelTest(data5, Normal(mi_2,sigma_2));
```

$$hypothesis = true, criticalvalue = 7.814728288, distribution = ChiSquare(3), pvalue = 0.5941543277, statistic = 1.896544755$$

```
> TwoSampleFTest(data4,data5,1,confidence=0.95);
```

$$hypothesis = true, confidenceinterval = 0.222981411792330..2.82897781515406, distribution = FRatio(13, 9), pvalue = 0.7718859762, statistic = 0.854151609987895$$

```
>
TwoSampleTTest(data4,data5,0,confidence=0.95,equalvariances=true)
;
```

*hypothesis* = *true*, *confidenceinterval* = $-15.6599374358834$
..37.3170802358834, *distribution* = *StudentT*(22), *pvalue*
= 0.4056764004, *statistic* = 0.847804710262409

>