

# Package: pk4adi (via r-universe)

September 9, 2024

**Type** Package

**Title** PK for Anesthetic Depth Indicators

**Version** 0.1.3

**Maintainer** Feng Jiang <silencejiang@zju.edu.cn>

**Description** Calculate and compare the Anesthetic Depth Indicators PK values in R language The prediction probability (PK) is a widely used tool for the anesthetic depth indicators, which was first proposed by Dr. Warren D. Smith in the paper Warren D. Smith; Robert C. Dutton; Ty N. Smith (1996) <doi:10.1097/0000542-199601000-00005> and Warren D. Smith; Robert C. Dutton; Ty N. Smith (1996) <doi:10.1002/(SICI)1097-0258(19960615)15:11<1199::AID-SIM218>3.0.CO;2-Y>. They provide the Micro xls files to calculate and compare the PK values. This package provide the easy-to-use API to calculate and compare the PK values using the R language. The package's name, pk4adi, is short for ``PK for Anesthetic Depth Indicators".

**License** MIT + file LICENSE

**Encoding** UTF-8

**LazyData** true

**URL** <https://www.r-project.org>, <https://github.com/xfz329/rpk4adi>

**BugReports** <https://github.com/xfz329/rpk4adi/issues>

**RoxygenNote** 7.2.3

**Imports** data.table (>= 1.10), stats

**Repository** <https://xfz329.r-universe.dev>

**RemoteUrl** <https://github.com/xfz329/rpk4adi>

**RemoteRef** HEAD

**RemoteSha** 7b64517281f1acdd3e7433a70be5f151b5b55a36

## Contents

calculate_pk . . . . .	2
compare_pks . . . . .	3
<b>Index</b>	<b>5</b>

---

calculate_pk	<i>Compute the PK value to Measure the Performance of Anesthetic Depth Indicators.</i>
--------------	--

---

### Description

Compute the PK value to Measure the Performance of Anesthetic Depth Indicators.

### Usage

```
calculate_pk(x_in, y_in)
```

### Arguments

x_in	a vector, the indicator.
y_in	a vector, the state.

### Value

a list containing all the matrices and variables during the calculation. The value list\$type is "PK", which indicated the list is the return-value of the function calculate\_pk(). The type of list\$basic is also a list, which contains the most important results of the function. The type of list\$matrices is also a list, which contains all the matrices during the calculation. The type of list\$details is also a list, which contains all the intermediate variables during the calculation.

### References

- Warren D. Smith, Robert C. Dutton, Ty N. Smith; Measuring the Performance of Anesthetic Depth Indicators. *Anesthesiology* 1996; 84:38–51 doi: <https://doi.org/10.1097/00000542-199601000-00005>.
- Warren D. Smith, Robert C. Dutton, Ty N. Smith; A measure of association for assessing prediction accuracy that is a generalization of nonparametric ROC area. *Statistics in Medicine* 1996; 15: 1119–1215 doi: [https://doi.org/10.1002/\(SICI\)1097-0258\(19960615\)15:11<1199::AID-SIM218>3.0.CO;2-Y](https://doi.org/10.1002/(SICI)1097-0258(19960615)15:11<1199::AID-SIM218>3.0.CO;2-Y).

**Examples**

```
x1 <- c(0, 0, 0, 0, 0, 0)
y1 <- c(1, 1, 1, 1, 1, 2)
ans1 <- calculate_pk(x1, y1)

## show the most important results.
print(ans1$basic)

x2 <- c(1, 1, 2, 2, 2, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4, 5, 5, 5, 5, 6, 6, 6, 6, 6)
y2 <- c(1, 1, 1, 1, 1, 2, 1, 1, 3, 3, 2, 2, 2, 2, 2, 1, 3, 3, 3, 3, 3, 3, 3)
ans2 <- calculate_pk(x2, y2)

## show the full results.
print(ans2)
```

---

compare\_pks

---

*Compare two answers of the PK values.*


---

**Description**

Both of the two input have to be the output of the function `calculate_pk()`.

**Usage**

```
compare_pks(pk1, pk2)
```

**Arguments**

pk1            a list, the output of the function `calculate_pk()`.  
pk2            a list, the output of the function `calculate_pk()`.

**Value**

a list containing all the variables during the calculation. The value `list$type` is "PKC", which indicated the list is the return-value of the function `compare_pk()`. The type of `list$group` is also a list, which contains the normal distribution test results for the group variables. The type of `list$pair` is also a list, which contains the t distribution test results for the pair variables. The type of `list$details` is also a list, which contains all the intermediate variables during the calculation.

**References**

Warren D. Smith, Robert C. Dutton, Ty N. Smith; Measuring the Performance of Anesthetic Depth Indicators. *Anesthesiology* 1996; 84:38–51 doi: <https://doi.org/10.1097/00000542-199601000-00005>.

Warren D. Smith, Robert C. Dutton, Ty N. Smith; A measure of association for assessing prediction accuracy that is a generalization of nonparametric ROC area. *Statistics in Medicine* 1996; 15: 1119-1215 doi: [https://doi.org/10.1002/\(SICI\)1097-0258\(19960615\)15:11<1199::AID-SIM218>3.0.CO;2-Y](https://doi.org/10.1002/(SICI)1097-0258(19960615)15:11<1199::AID-SIM218>3.0.CO;2-Y).

**Examples**

```
x1 <- c(1, 1, 2, 2, 2, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4, 5, 5, 5, 5, 6, 6, 6, 6, 6)
y1 <- c(1, 1, 1, 1, 1, 2, 1, 1, 3, 3, 2, 2, 2, 2, 2, 1, 3, 3, 3, 3, 3, 3, 3, 3)
```

```
pk1 <- calculate_pk(x_in = x1, y_in = y1)
print(pk1$basic)
```

```
x2 <- c(1, 1, 2, 2, 2, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4, 5, 5, 5, 5, 6, 6, 6, 6, 6)
y2 <- c(1, 1, 2, 1, 1, 2, 1, 2, 3, 3, 2, 2, 1, 2, 2, 2, 3, 3, 3, 3, 2, 3, 3, 2)
```

```
pk2 <- calculate_pk(x_in = x2, y_in = y2)
print(pk2$basic)
```

```
ans <- compare_pks(pk1, pk2)
print(ans$group)
print(ans$pair)
```

# Index

calculate\_pk, [2](#)  
compare\_pks, [3](#)