Package: pda (via r-universe)

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Type Package

Title Privacy-Preserving Distributed Algorithms

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Description A collection of privacy-preserving distributed algorithms (PDAs) for conducting federated statistical learning across multiple data sites. The PDA framework includes models for various tasks such as regression, trial emulation, causal inference, design-specific analysis, and clustering. The PDA algorithms run on a lead site and only require summary statistics from collaborating sites, with one or few iterations. The package can be used together with the online data transfer system (<https://pda-ota.pdamethods.org/>) for safe and convenient collaboration. For more information, please visit our software websites: <https://github.com/Penncil/pda>, and <https://pdamethods.org/>.

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Suggests lme4

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Contents

ADAP_data . . . 2
COLA_covid . . . 3
covid . . . 3
cs . . . 4
getCloudConfig . . . 5
LATTE_ADRD . . . 5
long_covid . . . 15
LOS . . . 16
lung2 . . . 16
nominal_data_hetero . . . 17
ODACAT_nominal . . . 17
ODACAT_ordinal . . . 18
odach_cc . . . 18
ordinal_data . . . 19
pda . . . 19
pdaCatalog . . . 21
pdaGet . . . 22
pdaList . . . 22
pdaPut . . . 23
pdaSync . . . 23
run_pooled_analysis . . . 24

Index **25**

`ADAP_data` *ADAP simulated data*

Description

A simulated data set for ADAP demonstration

Usage

```
ADAP_data
```

Format

A list containing the following elements:

sites site id, 300 'site1', 300 'site2', 300 'site3'

status binary outcome of length 900

x 900 by 49 matrix generated by standard normal distribution, representing the covariates

---

COLA_covid *COLA simulated data*

Description

A simulated COVID-19 data set for Collaborative One-shot and Lossless Algorithms of generalized linear models (COLA-GLM)

Usage

```
COLA_covid
```

Format

A data frame with 1500 rows and 6 variables:

site site, 600 'site1', 500 'site2', 400 'site3'

age binary age

sex binary sex

medical_condition binary medical condition

status binary outcome, COVID-19 status. This is the binary outcome for COLA logistic regression

visits poisson outcome, number of visits. This is the count outcome for COLA Poisson regression

---

covid *COVID-19 LOS and mortality data*

Description

A simulated data set of hospitalization Length of Stay (LOS) and mortality from 6 sites

Usage

```
covid
```

Format

A data frame with 2100 rows and 6 variables:

site site id, 600 'site1', 500 'site2', 400 'site3', 300 'site4', 200 'site5', 100 'site6'

age continuous age in year, min 3 max 97

sex 2 categories, '1' for male and '0' for female

lab lab test results, continuous value ranging from 2.3 to 97.4

los LOS in days, ranging from 1 to 29

death mortality status, '1' for death and '0' for alive.

---

cs *CrabSatellites data*

Description

A data set modified from the CrabSatellites data in countreg package (see demo(ODAH)).

Usage

```
cs
```

Format

A data frame containing 173 observations on 4 variables.

site Simulated site id, 85 'site1' and 88 'site2'.

satellites Number of satellites. Treated as (zero-inflated) count outcome in ODAH

width Carapace width (cm).

weight Weight (kg).

Source

https://rdrr.io/rforge/countreg/man/CrabSatellites.html

getCloudConfig *gather cloud settings into a list*

Description

gather cloud settings into a list

Usage

```
getCloudConfig(site_id,dir=NULL,uri=NULL,secret=NULL,silent_message=T)
```

Arguments

site_id	site identifier
dir	shared directory path if flat files
uri	web uri if web service
secret	web token if web service
silent_message	logical, if the message will be muted

Value

A list of cloud parameters: site_id, secret and uri

See Also

pda

LATTE_ADRD *LATTE simulated data*

Description

A simulated ADRD data set for Lossless Oneshot Algorithm for Target Trial Emulation (LATTE)

Usage

```
LATTE_ADRD
```

Format

A data frame with 1224 rows and 326 variables:

ID Unique patient identifier

Stroke...Transient.Ischemic.Attack History of Stroke or Transient Ischemic Attack, binary indicator

Acquired.Hypothyroidism History of Acquired Hypothyroidism, binary indicator

Fibromyalgia..Chronic.Pain.and.Fatigue History of Fibromyalgia, Chronic Pain and Fatigue, binary indicator

RA.OA..Rheumatoid.Arthritis..Osteoarthritis. History of RA/OA (Rheumatoid Arthritis / Osteoarthritis), binary indicator

Hypertension History of Hypertension, binary indicator

Anxiety.Disorders History of Anxiety Disorders, binary indicator

Chronic.Obstructive.Pulmonary.Disease.and.Bronchiectasis History of Chronic Obstructive Pulmonary Disease (COPD) and Bronchiectasis, binary indicator

Asthma History of Asthma, binary indicator

Traumatic.Brain.Injury.and.Nonpsychotic.Mental.Disorders.due.to.Brain.Damage History of Traumatic Brain Injury and Nonpsychotic Mental Disorders due to Brain Damage, binary indicator

Sleep.disorders History of Sleep disorders, binary indicator

ADHD..Conduct.Disorders..and.Hyperkinetic.Syndrome History of ADHD, Conduct Disorders, and Hyperkinetic Syndrome, binary indicator

Cataract History of Cataract, binary indicator

Migraine.and.Chronic.Headache History of Migraine and Chronic Headache, binary indicator

Depressive.Disorders History of Depressive Disorders, binary indicator

Hyperlipidemia History of Hyperlipidemia, binary indicator

Sensory...Deafness.and.Hearing.Impairment History of Sensory Deafness and Hearing Impairment, binary indicator

Female...Male.Breast.Cancer History of Female/Male Breast Cancer, binary indicator

Personality.Disorders History of Personality Disorders, binary indicator

Anemia History of Anemia, binary indicator

Chronic.Kidney.Disease History of Chronic Kidney Disease, binary indicator

Schizophrenia.and.Other.Psychotic.Disorders History of Schizophrenia and Other Psychotic Disorders, binary indicator

Glaucoma History of Glaucoma, binary indicator

Peripheral.Vascular.Disease..PVD. History of Peripheral Vascular Disease (PVD), binary indicator

Heart.Failure History of Heart Failure, binary indicator

Pressure.and.Chronic.Ulcers History of Pressure and Chronic Ulcers, binary indicator

Obesity History of Obesity, binary indicator

Diabetes History of Diabetes, binary indicator

Mobility.Impairments History of Mobility Impairments, binary indicator

Benign.Prostatic.Hyperplasia History of Benign Prostatic Hyperplasia, binary indicator

Drug.Use.Disorders History of Drug Use Disorders, binary indicator

Alcohol.Use.Disorders History of Alcohol Use Disorders, binary indicator

Post.Traumatic.Stress.Disorder..PTSD. History of Post Traumatic Stress Disorder (PTSD), binary indicator

Atrial.Fibrillation History of Atrial Fibrillation, binary indicator

Tobacco.Use History of Tobacco Use, binary indicator

Ischemic.Heart.Disease History of Ischemic Heart Disease, binary indicator

Liver.Disease..Cirrhosis.and.Other.Liver.Conditions..except.Viral.Hepatitis. History of Liver Disease (Cirrhosis and Other Liver Conditions except Viral Hepatitis), binary indicator

Sensory...Blindness.and.Visual.Impairment History of Sensory Blindness and Visual Impairment, binary indicator

Bipolar.Disorder History of Bipolar Disorder, binary indicator

Depression History of Depression, binary indicator

Prostate.Cancer History of Prostate Cancer, binary indicator

Acute.Myocardial.Infarction History of Acute Myocardial Infarction, binary indicator

Hip.Pelvic.Fracture History of Hip/Pelvic Fracture, binary indicator

Other.Developmental.Delays History of Other Developmental Delays, binary indicator

Viral.Hepatitis..General. History of Viral Hepatitis (General), binary indicator

Sickle.Cell.Disease History of Sickle Cell Disease, binary indicator

Multiple.Sclerosis.and.Transverse.Myelitis History of Multiple Sclerosis and Transverse Myelitis, binary indicator

Leukemias.and.Lymphomas History of Leukemias and Lymphomas, binary indicator

Opioid.Use.Disorder History of Opioid Use Disorder, binary indicator

Colorectal.Cancer History of Colorectal Cancer, binary indicator

Epilepsy History of Epilepsy, binary indicator

Osteoporosis History of Osteoporosis, binary indicator

Intellectual.Disabilities.and.Related.Conditions History of Intellectual Disabilities and Related Conditions, binary indicator

Spinal.Cord.Injury History of Spinal Cord Injury, binary indicator

Endometrial.Cancer History of Endometrial Cancer, binary indicator

Spina.Bifida.and.Other.Congenital.Anomalies.of.the.Nervous.System History of Spina Bifida and Other Congenital Anomalies of the Nervous System, binary indicator

Learning.Disabilities History of Learning Disabilities, binary indicator

Periodontitis History of Periodontitis, binary indicator

Lung.Cancer History of Lung Cancer, binary indicator

Cystic.Fibrosis.and.Other.Metabolic.Developmental.Disorders History of Cystic Fibrosis and Other Metabolic Developmental Disorders, binary indicator

Cerebral.Palsy History of Cerebral Palsy, binary indicator

Human.Immunodeficiency.Virus.and.or.Acquired.Immunodeficiency.Syndrome..HIV.AIDS. History of Human Immunodeficiency Virus and/or Acquired Immunodeficiency Syndrome (HIV/AIDS), binary indicator

Menopause History of Menopause, binary indicator

Muscular.Dystrophy History of Muscular Dystrophy, binary indicator

Autism.Spectrum.Disorders History of Autism Spectrum Disorders, binary indicator

atorvastatin History of atorvastatin use, binary indicator

hydrochlorothiazide History of hydrochlorothiazide use, binary indicator

amlodipine History of amlodipine use, binary indicator

aspirin History of aspirin use, binary indicator

metoprolol History of metoprolol use, binary indicator

levothyroxine History of levothyroxine use, binary indicator

metformin History of metformin use, binary indicator

lisinopril History of lisinopril use, binary indicator

simvastatin History of simvastatin use, binary indicator

sodium.chloride History of sodium chloride use, binary indicator

omeprazole History of omeprazole use, binary indicator

albuterol History of albuterol use, binary indicator

potassium.chloride History of potassium chloride use, binary indicator

sertraline History of sertraline use, binary indicator

lidocaine History of lidocaine use, binary indicator

furosemide History of furosemide use, binary indicator

losartan History of losartan use, binary indicator

donepezil History of donepezil use, binary indicator

cholecalciferol History of cholecalciferol use, binary indicator

ondansetron History of ondansetron use, binary indicator

oxycodone History of oxycodone use, binary indicator

lorazepam History of lorazepam use, binary indicator

glucose.oxidase History of glucose oxidase use, binary indicator

prednisone History of prednisone use, binary indicator

fluticasone History of fluticasone use, binary indicator

gabapentin History of gabapentin use, binary indicator

rosuvastatin History of rosuvastatin use, binary indicator

tamsulosin History of tamsulosin use, binary indicator

fentanyl History of fentanyl use, binary indicator

carbidopa History of carbidopa use, binary indicator

pantoprazole History of pantoprazole use, binary indicator

escitalopram History of escitalopram use, binary indicator

insulin.aspart..human History of insulin aspart (human) use, binary indicator

clonazepam History of clonazepam use, binary indicator

carvedilol History of carvedilol use, binary indicator

heparin History of heparin use, binary indicator

bupropion History of bupropion use, binary indicator

polyethylene.glycol.3350 History of polyethylene glycol 3350 use, binary indicator

pravastatin History of pravastatin use, binary indicator

docusate History of docusate use, binary indicator

vitamin.B12 History of vitamin B12 use, binary indicator

clopidogrel History of clopidogrel use, binary indicator

atenolol History of atenolol use, binary indicator

glipizide History of glipizide use, binary indicator

ascorbic.acid History of ascorbic acid use, binary indicator

glucose History of glucose use, binary indicator

insulin.glargine History of insulin glargine use, binary indicator

zolpidem History of zolpidem use, binary indicator

warfarin History of warfarin use, binary indicator

azithromycin History of azithromycin use, binary indicator

trazodone History of trazodone use, binary indicator

esomeprazole History of esomeprazole use, binary indicator

sennosides..USP History of sennosides (USP) use, binary indicator

propofol History of propofol use, binary indicator

iopamidol History of iopamidol use, binary indicator

diltiazem History of diltiazem use, binary indicator

ibuprofen History of ibuprofen use, binary indicator

dexamethasone History of dexamethasone use, binary indicator

tramadol History of tramadol use, binary indicator

amoxicillin History of amoxicillin use, binary indicator

midazolam History of midazolam use, binary indicator

lansoprazole History of lansoprazole use, binary indicator

citalopram History of citalopram use, binary indicator

valsartan History of valsartan use, binary indicator

ciprofloxacin History of ciprofloxacin use, binary indicator

famotidine History of famotidine use, binary indicator

calcium.carbonate History of calcium carbonate use, binary indicator
finasteride History of finasteride use, binary indicator
levofloxacin History of levofloxacin use, binary indicator
sulfamethoxazole History of sulfamethoxazole use, binary indicator
duloxetine History of duloxetine use, binary indicator
alprazolam History of alprazolam use, binary indicator
naproxen History of naproxen use, binary indicator
levetiracetam History of levetiracetam use, binary indicator
ranitidine History of ranitidine use, binary indicator
triamcinolone History of triamcinolone use, binary indicator
salmeterol History of salmeterol use, binary indicator
folic.acid History of folic acid use, binary indicator
nifedipine History of nifedipine use, binary indicator
ferrous.sulfate History of ferrous sulfate use, binary indicator
morphine History of morphine use, binary indicator
hydralazine History of hydralazine use, binary indicator
montelukast History of montelukast use, binary indicator
magnesium.sulfate History of magnesium sulfate use, binary indicator
methylphenidate History of methylphenidate use, binary indicator
hydrocortisone History of hydrocortisone use, binary indicator
latanoprost History of latanoprost use, binary indicator
quetiapine History of quetiapine use, binary indicator
metronidazole History of metronidazole use, binary indicator
diphenhydramine History of diphenhydramine use, binary indicator
memantine History of memantine use, binary indicator
methylprednisolone History of methylprednisolone use, binary indicator
doxycycline History of doxycycline use, binary indicator
fluoxetine History of fluoxetine use, binary indicator
paroxetine History of paroxetine use, binary indicator
gadobenate History of gadobenate use, binary indicator
propranolol History of propranolol use, binary indicator
ramipril History of ramipril use, binary indicator
ezetimibe History of ezetimibe use, binary indicator
allopurinol History of allopurinol use, binary indicator
enoxaparin History of enoxaparin use, binary indicator
apixaban Binary indicator for history of apixaban
sildenafil Binary indicator for history of sildenafil

oxybutynin Binary indicator for history of oxybutynin
insulin.lispro Binary indicator for history of insulin lispro
melatonin Binary indicator for history of melatonin
tadalafil Binary indicator for history of tadalafil
hydromorphone Binary indicator for history of hydromorphone
ipratropium Binary indicator for history of ipratropium
cephalexin Binary indicator for history of cephalexin
lovastatin Binary indicator for history of lovastatin
mirtazapine Binary indicator for history of mirtazapine
venlafaxine Binary indicator for history of venlafaxine
fenofibrate Binary indicator for history of fenofibrate
guaifenesin Binary indicator for history of guaifenesin
estradiol Binary indicator for history of estradiol
nitroglycerin Binary indicator for history of nitroglycerin
pregabalin Binary indicator for history of pregabalin
lamotrigine Binary indicator for history of lamotrigine
enalapril Binary indicator for history of enalapril
ergocalciferol Binary indicator for history of ergocalciferol
ketoconazole Binary indicator for history of ketoconazole
spironolactone Binary indicator for history of spironolactone
cyclobenzaprine Binary indicator for history of cyclobenzaprine
meloxicam Binary indicator for history of meloxicam
cetirizine Binary indicator for history of cetirizine
alendronate Binary indicator for history of alendronate
nortriptyline Binary indicator for history of nortriptyline
bisacodyl Binary indicator for history of bisacodyl
sitagliptin Binary indicator for history of sitagliptin
salmon.oil Binary indicator for history of salmon oil
olmesartan Binary indicator for history of olmesartan
timolol Binary indicator for history of timolol
nitrofurantoin Binary indicator for history of nitrofurantoin
celecoxib Binary indicator for history of celecoxib
glimepiride Binary indicator for history of glimepiride
iohexol Binary indicator for history of iohexol
clonidine Binary indicator for history of clonidine
valacyclovir Binary indicator for history of valacyclovir
ropinirole Binary indicator for history of ropinirole

bupivacaine Binary indicator for history of bupivacaine

benzonatate Binary indicator for history of benzonatate

carbamazepine Binary indicator for history of carbamazepine

meclizine Binary indicator for history of meclizine

azelastine Binary indicator for history of azelastine

diclofenac Binary indicator for history of diclofenac

clobetasol Binary indicator for history of clobetasol

ketorolac Binary indicator for history of ketorolac

amphetamine Binary indicator for history of amphetamine

budesonide Binary indicator for history of budesonide

diazepam Binary indicator for history of diazepam

repaglinide Binary indicator for history of repaglinide

omega.3.acid.ethyl.esters..USP. Binary indicator for history of omega-3-acid ethyl esters (USP)

methadone Binary indicator for history of methadone

clindamycin Binary indicator for history of clindamycin

rivaroxaban Binary indicator for history of rivaroxaban

vitamin.E Binary indicator for history of vitamin E

valproate Binary indicator for history of valproate

tiotropium Binary indicator for history of tiotropium

temazepam Binary indicator for history of temazepam

chlorhexidine Binary indicator for history of chlorhexidine

hydroxychloroquine Binary indicator for history of hydroxychloroquine

nystatin Binary indicator for history of nystatin

olanzapine Binary indicator for history of olanzapine

nicotine Binary indicator for history of nicotine

mometasone Binary indicator for history of mometasone

prednisolone Binary indicator for history of prednisolone

estrogens..conjugated..USP. Binary indicator for history of conjugated estrogens (USP)

mupirocin Binary indicator for history of mupirocin

loratadine Binary indicator for history of loratadine

fexofenadine Binary indicator for history of fexofenadine

solifenacin Binary indicator for history of solifenacin

irbesartan Binary indicator for history of irbesartan

ephedrine Binary indicator for history of ephedrine

isosorbide Binary indicator for history of isosorbide

gadoterate.meglumine Binary indicator for history of gadoterate meglumine

ubidecarenone Binary indicator for history of ubidecarenone

verapamil Binary indicator for history of verapamil

promethazine Binary indicator for history of promethazine

doxazosin Binary indicator for history of doxazosin

fluconazole Binary indicator for history of fluconazole

haloperidol Binary indicator for history of haloperidol

rivastigmine Binary indicator for history of rivastigmine

labetalol Binary indicator for history of labetalol

eszopiclone Binary indicator for history of eszopiclone

insulin.detemir Binary indicator for history of insulin detemir

aripiprazole Binary indicator for history of aripiprazole

vancomycin Binary indicator for history of vancomycin

thiamine Binary indicator for history of thiamine

epinephrine Binary indicator for history of epinephrine

amitriptyline Binary indicator for history of amitriptyline

tolterodine Binary indicator for history of tolterodine

cefazolin Binary indicator for history of cefazolin

lisdexamfetamine Binary indicator for history of lisdexamfetamine

risperidone Binary indicator for history of risperidone

mirabegron Binary indicator for history of mirabegron

magnesium.oxide Binary indicator for history of magnesium oxide

niacin Binary indicator for history of niacin

pramipexole Binary indicator for history of pramipexole

zoledronic.acid Binary indicator for history of zoledronic acid

sex Binary sex

age Age (continuous)

race Race

days Time from index to event (continuous)

index_date Index date of diagnosis

treatment Binary treatment indicator

outcome_AD_value Outcome binary indicator: AD

outcome_AD_time Outcome time: AD

outcome_ADRD_value Outcome binary indicator: ADRD

outcome_ADRD_time Outcome time: ADRD

outcome_acute_conjunctivitis_value Outcome binary indicator: acute conjunctivitis

outcome_acute_conjunctivitis_time Outcome time: acute conjunctivitis

outcome_acute_tonsillitis_value Outcome binary indicator: acute tonsillitis

outcome_acute_tonsillitis_time Outcome time: acute tonsillitis

outcome_adhesive_capsulitis_of_shoulder_value Outcome binary indicator: adhesive capsulitis of shoulder

outcome_adhesive_capsulitis_of_shoulder_time Outcome time: adhesive capsulitis of shoulder

outcome_allergic_rhinitis_value Outcome binary indicator: allergic rhinitis

outcome_allergic_rhinitis_time Outcome time: allergic rhinitis

outcome_blepharitis_value Outcome binary indicator: blepharitis

outcome_blepharitis_time Outcome time: blepharitis

outcome_carpal_tunnel_syndrome_value Outcome binary indicator: carpal tunnel syndrome

outcome_carpal_tunnel_syndrome_time Outcome time: carpal tunnel syndrome

outcome_chalazion_value Outcome binary indicator: chalazion

outcome_chalazion_time Outcome time: chalazion

outcome_contact_dermatitis_value Outcome binary indicator: contact dermatitis

outcome_contact_dermatitis_time Outcome time: contact dermatitis

outcome_dental_caries_value Outcome binary indicator: dental caries

outcome_dental_caries_time Outcome time: dental caries

outcome_deviated_nasal_septum_value Outcome binary indicator: deviated nasal septum

outcome_deviated_nasal_septum_time Outcome time: deviated nasal septum

outcome_foreign_body_in_ear_value Outcome binary indicator: foreign body in ear

outcome_foreign_body_in_ear_time Outcome time: foreign body in ear

outcome_gout_value Outcome binary indicator: gout

outcome_gout_time Outcome time: gout

outcome_hemorrhoids_value Outcome binary indicator: hemorrhoids

outcome_hemorrhoids_time Outcome time: hemorrhoids

outcome_impacted_cerumen_value Outcome binary indicator: impacted cerumen

outcome_impacted_cerumen_time Outcome time: impacted cerumen

outcome_influenza_value Outcome binary indicator: influenza

outcome_influenza_time Outcome time: influenza

outcome_ingrowing_nail_value Outcome binary indicator: ingrowing nail

outcome_ingrowing_nail_time Outcome time: ingrowing nail

outcome_low_back_pain_value Outcome binary indicator: low back pain

outcome_low_back_pain_time Outcome time: low back pain

outcome_menieres_disease_value Outcome binary indicator: menieres disease

outcome_menieres_disease_time Outcome time: menieres disease

outcome_osteoarthritis_of_knee_value Outcome binary indicator: osteoarthritis of knee

outcome_osteoarthritis_of_knee_time Outcome time: osteoarthritis of knee

outcome_osteoporosis_value Outcome binary indicator: osteoporosis

outcome_osteoporosis_time Outcome time: osteoporosis

outcome_foot_drop_value Outcome binary indicator: foot drop

outcome_foot_drop_time Outcome time: foot drop

outcome_hearing_problem_value Outcome binary indicator: hearing problem

outcome_hearing_problem_time Outcome time: hearing problem

outcome_intra_abdominal_and_pelvic_swelling_mass_and_lump_value Outcome binary indicator: intra abdominal and pelvic swelling mass and lump

outcome_intra_abdominal_and_pelvic_swelling_mass_and_lump_time Outcome time: intra abdominal and pelvic swelling mass and lump

outcome_irritability_and_anger_value Outcome binary indicator: irritability and anger

outcome_irritability_and_anger_time Outcome time: irritability and anger

outcome_wristdrop_value Outcome binary indicator: wristdrop

outcome_wristdrop_time Outcome time: wristdrop

site Study site identifier

`long_covid` *DisC2o simulated data*

Description

A simulated long-covid data set for Distributed causal inference with covariates shift (DisC2o). This only contains 5 covariates and more noisy covariates can be added when running demo example.

Usage

```
long_covid
```

Format

A data frame with 900 rows and 53 variables:

PASC_features number of Post Acute Sequelae of COVID (PASC, or long covid) features

covid_vaccination treatment of covid vaccination, 1=vaccinated

site site id, 300 participants each for 'site1', 'site2', and 'site3'

X1 a binary covariate

X2 a binary covariate

X3 a continuous covariate

X4 a continuous covariate

X5 a continuous covariate

LOS *Length of Stay data*

Description

A simulated data set of hospitalization Length of Stay (LOS) from 3 sites

Usage

```
LOS
```

Format

A data frame with 1000 rows and 5 variables:

site site id, 500 'site1', 400 'site2' and 100 'site3'

age 3 categories, 'young', 'middle', and 'old'

sex 2 categories, 'M' for male and 'F' for female

lab lab test results, continuous value ranging from 0 to 100

los LOS in days, ranging from 1 tp 28. Treated as continuous outcome in DLM

lung2 *Lung cancer survival time data*

Description

A data set modified from the lung data in survival package (see demo(ODAC)).

Usage

```
lung2
```

Format

A data frame with 228 rows and 5 variables:

site simulated site id, 86 'site1', 83 'site2' and 59 'site3'

time survival time in days

status censoring status 0=censored, 1=dead

age age in years

sex 1 for female and 0 for male

Source

https://CRAN.R-project.org/package=survival

nominal_data_hetero *ODACATH simulated data with nominal outcome*

Description

A simulated data set for ODACATH demonstration

Usage

```
nominal_data_hetero
```

Format

A list containing the following elements:

id.site site id, 100 'site1', 100 'site2', 100 'site3'

y nominal outcome taking values 1,2,3

X1_cont a continuous covariate

X2_bin a binary covariate

ODACAT_nominal *ODACAT simulated data with nominal outcome*

Description

A simulated data set for ODACAT demonstration

Usage

```
ODACAT_nominal
```

Format

A list containing the following elements:

id.site site id, 100 'site1', 100 'site2', 100 'site3'

outcome nominal outcome taking values 1,2,3

X1 a continuous covariate

X2 a binary covariate

X3 a binary covariate

ODACAT_ordinal *ODACAT simulated data with ordinal outcome*

Description

A simulated data set for ODACAT demonstration

Usage

```
ODACAT_ordinal
```

Format

A data frame with 300 rows and 5 variables:

id.site site id, 105 'site1', 105 'site2', 90 'site3'

outcome 3-category outcome, possible values are 1,2,3. Category 3 will be used as reference

X1 the first covariate, continuous

X2 the second covariate, binary

X3 the third covariate, binary

odach_cc *ODACH_CC simulated data*

Description

A simulated data set for ODACH with case-cohort design demonstration

Usage

```
odach_cc
```

Format

A data frame with 413 rows and 8 variables:

site site id, 187 'site1', 133 'site2', 93 'site3'. The full_cohort_size are 800, 600 and 400 respectively

subcohort 1=subcohort, e.g. uniformly subsampled from full_cohort_size, 0=case

time survival time

status censoring status 0=censored, 1=dead

X1 the first covariate, continuous

X2 the second covariate, continuous

Category the third covariate, categorical

Group the fourth covariate, categorical

ordinal_data *ODACATH simulated data with ordinal outcome*

Description

A simulated data set for ODACATH demonstration

Usage

```
ordinal_data
```

Format

A list containing the following elements:

id.site site id, 100 'site1', 100 'site2', 100 'site3'

y ordinal outcome taking values 1,2,3

X1_cont a continuous covariate

X2_bin a binary covariate

pda *PDA: Privacy-preserving Distributed Algorithm*

Description

Fit Privacy-preserving Distributed Algorithms for linear, logistic, Poisson and Cox PH regression with possible heterogeneous data across sites.

Usage

```
pda(ipdata=NULL,site_id,control=NULL,dir=NULL,uri=NULL,secret=NULL,
upload_without_confirm=F, silent_message=F, digits=4,hosdata=NULL)
```

Arguments

ipdata	Local IPD data in data frame, should include at least one column for the outcome and one column for the covariates
site_id	Character site name
control	pda control data
dir	directory for shared flat file cloud
uri	Universal Resource Identifier for this run
secret	password to authenticate as site_id on uri
upload_without_confirm	logical. TRUE if want silent upload, no interactive confirm

silent_message	logical. TRUE if want to mute message
digits	digits after decimal points in the output json files
hosdata	(for dGEM) hospital-level data, should include the same name as defined in the control file

Value

control

control

References

Michael I. Jordan, Jason D. Lee & Yun Yang (2019) Communication-Efficient Distributed Statistical Inference,
Journal of the American Statistical Association, 114:526, 668-681
doi:10.1080/01621459.2018.1429274.
(DLM) Yixin Chen, et al. (2006) Regression cubes with lossless compression and aggregation. IEEE Transactions on Knowledge and Data Engineering, 18(12), pp.1585-1599.
(DLMM) Chongliang Luo, et al. (2020) Lossless Distributed Linear Mixed Model with Application to Integration of Heterogeneous Healthcare Data. medRxiv, doi:10.1101/2020.11.16.20230730.
(DPQL) Chongliang Luo, et al. (2021) dPQL: a lossless distributed algorithm for generalized linear mixed model with application to privacy-preserving hospital profiling.
medRxiv, doi:10.1101/2021.05.03.21256561.
(ODAL) Rui Duan, et al. (2020) Learning from electronic health records across multiple sites:
A communication-efficient and privacy-preserving distributed algorithm.
Journal of the American Medical Informatics Association, 27.3:376–385,
doi:10.1093/jamia/ocz199.
(ODAC) Rui Duan, et al. (2020) Learning from local to global: An efficient distributed algorithm for modeling time-to-event data.
Journal of the American Medical Informatics Association, 27.7:1028–1036,
doi:10.1093/jamia/ocaa044.
(ODACH) Chongliang Luo, et al. (2021) ODACH: A One-shot Distributed Algorithm for Cox model with Heterogeneous Multi-center Data.
medRxiv, doi:10.1101/2021.04.18.21255694.
(ODAH) Mackenzie J. Edmondson, et al. (2021) An Efficient and Accurate Distributed Learning Algorithm for Modeling Multi-Site Zero-Inflated Count Outcomes. medRxiv, pp.2020-12.
doi:10.1101/2020.12.17.20248194.
(ADAP) Xiaokang Liu, et al. (2021) ADAP: multisite learning with high-dimensional heterogeneous data via A Distributed Algorithm for Penalized regression.
(dGEM) Jiayi Tong, et al. (2022) dGEM: Decentralized Generalized Linear Mixed Effects Model
(COLA) Wu, Q., Reps, J.M., Li, L. et al. COLA-GLM: collaborative one-shot and lossless algorithms of generalized linear models for decentralized observational healthcare data. npj Digit. Med. 8, 442 (2025). https://doi.org/10.1038/s41746-025-01781-1.
(ODACT) Liang CJ, Luo C, Kranzler HR, Bian J, Chen Y. Communication-efficient federated learning of temporal effects on opioid use disorder with data from distributed research networks. J Am Med Inform Assoc. 2025 Apr 1;32(4):656-664. doi: 10.1093/jamia/ocae313. PMID: 39864407; PMCID: PMC12005629.
(DisC2o) Tong J, et al. 2025. DisC2o-HD: Distributed causal inference with covariates shift for

analyzing real-world high-dimensional data. Journal of Machine Learning Research. 2025;26(3):1-50.

See Also

pdaPut, pdaList, pdaGet, getCloudConfig and pdaSync.

---

pdaCatalog *use this function to guide end-users step-by-step to identify best pda models for their tasks, and set up control.*

Description

use this function to guide end-users step-by-step to identify best pda models for their tasks, and set up control.

Usage

```
pdaCatalog(task=c('Regression', 'Survival', 'Trial_emulation',
'Causal_inference', 'Design_analysis', 'Clustering'),
write_json_file_path=getwd(), optim_maxit,optim_method,init_method)
```

Arguments

task	user-specified task, c('Regression', 'Survival', 'Trial_emulation', 'Causal_inference', 'Design_analysis', 'Clustering'). If no specify, display all models
write_json_file_path	directory path to write the control file to
optim_maxit	option in the control file for the optimization in pda, default 100
optim_method	option in the control file for the optimization in pda, default "BFGS"
init_method	option in the control file for calculating the initial estimate in pda, default "meta"

Value

pda control

See Also

pda

pdaGet *Function to download json and return as object*

Description

Function to download json and return as object

Usage

```
pdaGet(name,config)
```

Arguments

name	of file
config	cloud configuration

Value

A list of data objects from the json file on the cloud

See Also

pda

pdaList *Function to list available objects*

Description

Function to list available objects

Usage

```
pdaList(config)
```

Arguments

config	a list of variables for cloud configuration

Value

A list of (json) files on the cloud

See Also

pda

pdaPut *Function to upload object to cloud as json*

Description

Function to upload object to cloud as json

Usage

```
pdaPut(obj,name,config,upload_without_confirm=F,silent_message=F,digits=4)
```

Arguments

obj	R object to encode as json and uploaded to cloud
name	of file
config	a list of variables for cloud configuration
upload_without_confirm	logical. TRUE if want silent upload, no interactive confirm
silent_message	logical. TRUE if want to mute message
digits	digits after decimal points in the output json files

Value

NONE

See Also

pda

pdaSync *pda control synchronize*

Description

update pda control if ready (run by lead)

Usage

```
pdaSync(config,upload_without_confirm,silent_message, digits)
```

Arguments

config	cloud configuration
upload_without_confirm	logical. TRUE if want silent upload, no interactive confirm
silent_message	logical. TRUE if want to mute message
digits	digits after decimal points in the output json files

Value

control

See Also

pda

---

run_pooled_analysis *Function to perform all data processing and pooled stratified analysis*

Description

Function to perform all data processing and pooled stratified analysis

Usage

```
run_pooled_analysis(data, outcome_id, outcome_time, sites)
```

Arguments

data	The combined LATTE_ADRD data.
outcome_id	The name of the primary outcome column.
outcome_time	The name of the outcome time column (for Poisson).
sites	A vector of site identifiers.

Value

A list containing the results of the standard logistic and Poisson pooled analysis.

Index

∗ **datasets**
ADAP_data, 2
COLA_covid, 3
covid, 3
cs, 4
LATTE_ADRD, 5
long_covid, 15
LOS, 16
lung2, 16
nominal_data_hetero, 17
ODACAT_nominal, 17
ODACAT_ordinal, 18
odach_cc, 18
ordinal_data, 19

ADAP_data, 2

COLA_covid, 3
covid, 3
cs, 4

getCloudConfig, 5

LATTE_ADRD, 5
long_covid, 15
LOS, 16
lung2, 16

nominal_data_hetero, 17

ODACAT_nominal, 17
ODACAT_ordinal, 18
odach_cc, 18
ordinal_data, 19

pda, 19
pdaCatalog, 21
pdaGet, 22
pdaList, 22
pdaPut, 23
pdaSync, 23

run_pooled_analysis, 24