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# Análise de Contratos Públicos

FORCERA 

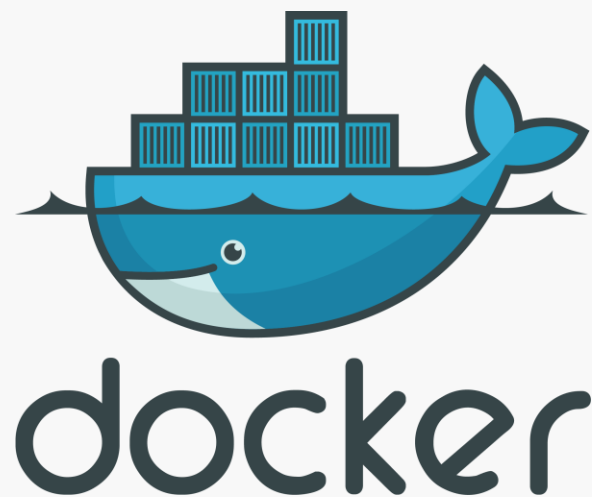
# Introdução

Familiarização com  
Ferramentas

Estudo do  
problema

Aplicação

# Familiarização com as ferramentas



# Estudo do Problema : OCDS e OCP



Open  
Contracting  
Partnership

**RED FLAGS** for integrity:  
Giving the **green light** to  
open data solutions

# Estudo do Problema : Código dos Contratos Públicos



- Tipos e Subtipos de Procedimentos
- Tipos de Contrato
- Valores máximos permitidos consoante o tipo de contrato
- Prazos legais associados

# Aplicação

	A	B	C	D	E	F	G	H
1	NEW ID	ID	Stage	Associated Scheme(s)	Red Flag	Indicator Description	Calculation method	Rationale
2	R001	F001	Planning	Info withholding/release of bad info	Key planning documents are not provided	Key planning documents unavailable	Check if key planning documents are published, for instance the procurement plans, market studies, feasibility study among others. Check the <a href="#">OCDS document type codelist</a> to see the possible documents.	A lack of planning documents could signal poor procurement planning or integrity risks.
3	R002	F002	Planning	Corruption; Unjustified Direct awards	Manipulation of procurement thresholds	Change in threshold value or grouping of a high number of procedures below threshold to avoid more competitive procedures.	Using the estimated value of the procurement identify if a high number of procedures is bundled just below threshold. For empirical examples on how to calculate this indicator see <a href="#">Tas, B. (2019)</a> or <a href="#">Palguta, J. (2017)</a> . The analysis can be done segmenting by sector.	Procurement thresholds for different levels of competition in bidding can be manipulated to avoid competition or prior review and to facilitate the award of contracts to favored bidders, often as the result of corruption (International Anticorruption Research Center, 2012).
4	R003	F003	Tender	Corruption; Excluding qualified bidders	Short or inadequate notice to bidders to submit expressions of interest or bids	Bid period is less than expected (usually <=2 days) The indicator should be calculated grouping by procurement method used, since the minimum bidding period might vary depending on the method. It is important to check in local regulations if there is a minimum period.	Calculate the number of days for the bidding period. Flag if a tender is below the threshold.	A short submission period leaves less time hence make it harder for non-connected companies to bid and to submit; well-connected firms can use its inside knowledge to win repeatedly.

Caracterização das 73 flags :

- Facilidade de Implementação
- Importância / Valor

# Aplicação

- R003 : Short or inadequate notice to bidders to submit expressions of interest or bids
- R017 : The difference between an item value and its expected value is above a threshold
- R018 : Sing Bid Receive
- R019 : Low number of bidders for item and procuring entity
- R025 : Perennial losing bidders give appearance when they have no intention of winning
- R031 : Bid is too close to budget or preferred solution
- R049 : High number of direct awards to one bidder
- R050 : One or few bidders win a disproportionate number of contracts of the same type
- R051 : A small number of companies concentrate a high share of contracts in a particular market

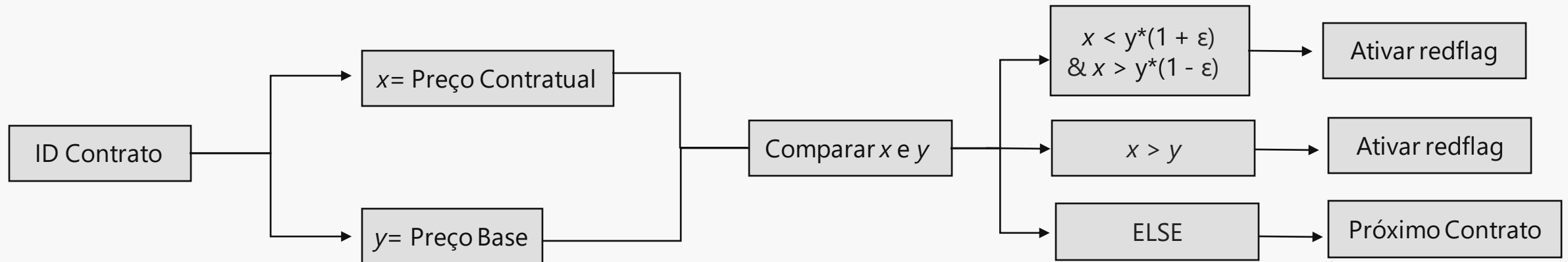
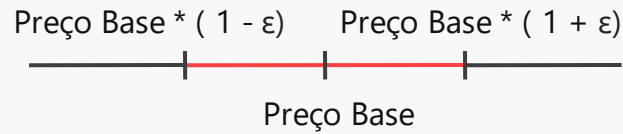


# Aplicação

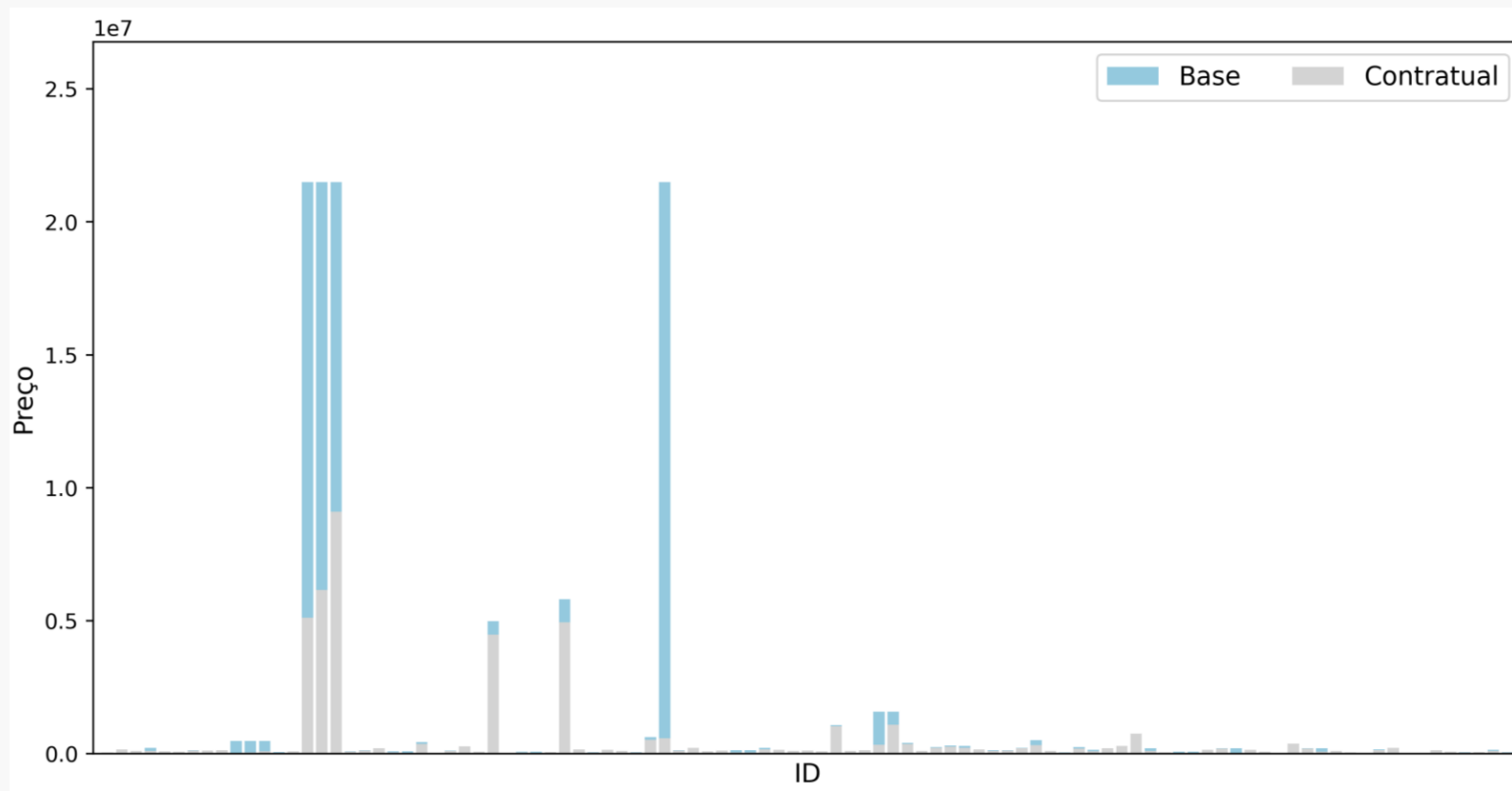
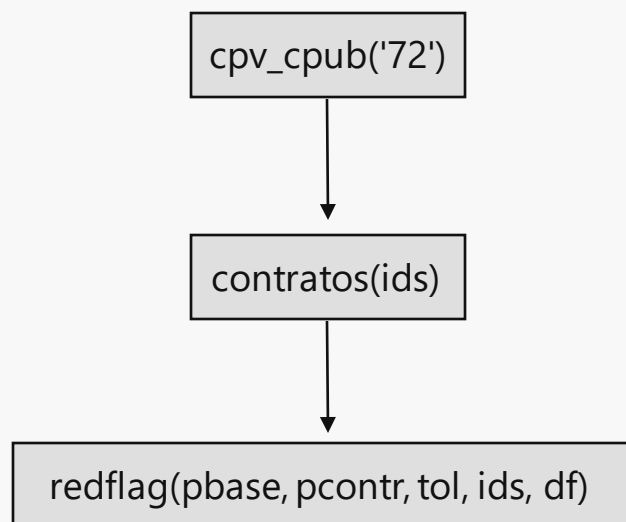
- RF1 : Verificar cumprimento dos preços máximos permitidos em Ajustes Diretos em Regime Geral
- RF2 : Verificar alterações do Preço Contratual após celebração do contrato
- RF3 : Verificar data de publicação do anúncio



# R031 : Bid is too close to budget or preferred solution



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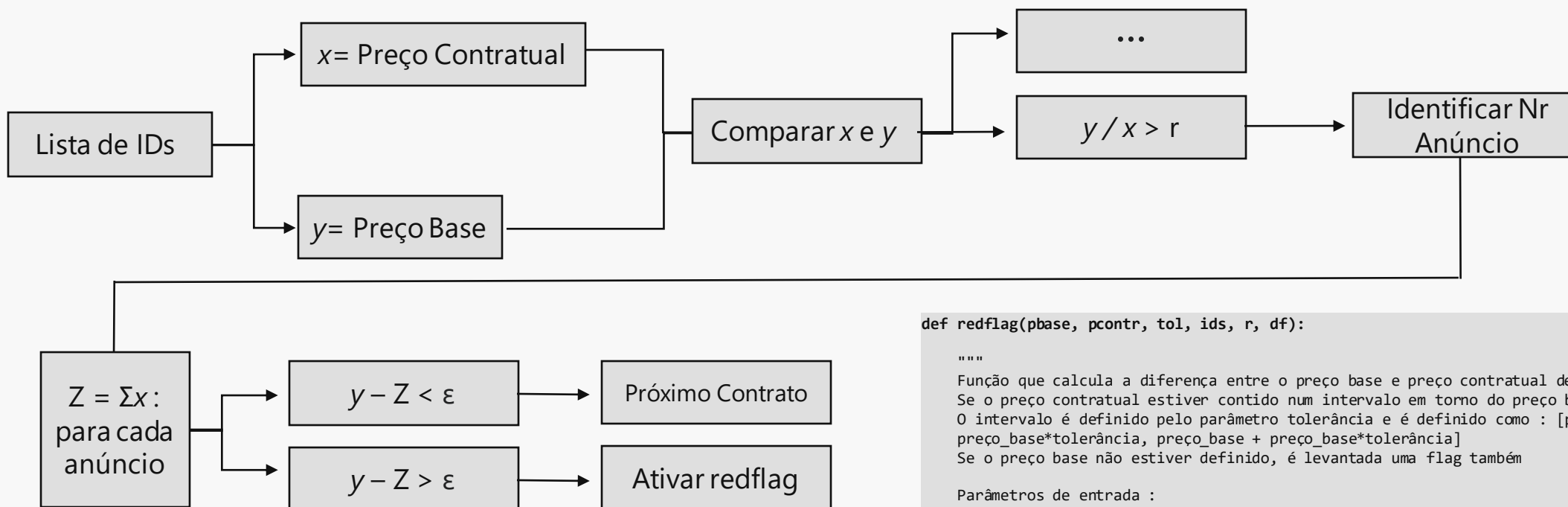
# R031 : Bid is too close to budget or preferred solution

Adjudicação por Lotes



Número de Anúncio	ID	Lote	Preço Base	Preço Contratual
11171/2023	10471090	1	373860.48	77454.72
	10471049	2		85365.84
	10470972	3		89886.72

# R031 : Bid is too close to budget or preferred solution



```
def redflag(pbase, pcontr, tol, ids, r, df):
```

```
"""
```

Função que calcula a diferença entre o preço base e preço contratual de um contrato realizado  
Se o preço contratual estiver contido num intervalo em torno do preço base é levantada um flag  
O intervalo é definido pelo parâmetro tolerância e é definido como : [preço\_base -  
preço\_base\*tolerância, preço\_base + preço\_base\*tolerância]  
Se o preço base não estiver definido, é levantada uma flag também

Parâmetros de entrada :

pbase : array com os preços base

pcontr : array com os preços contratuas

tol : valor da tolerância. Só pode tomar valores entre 0 e 1

ids : id's dos contratos em questão

r : ratio máximo permitido entre preço base / preço contratual

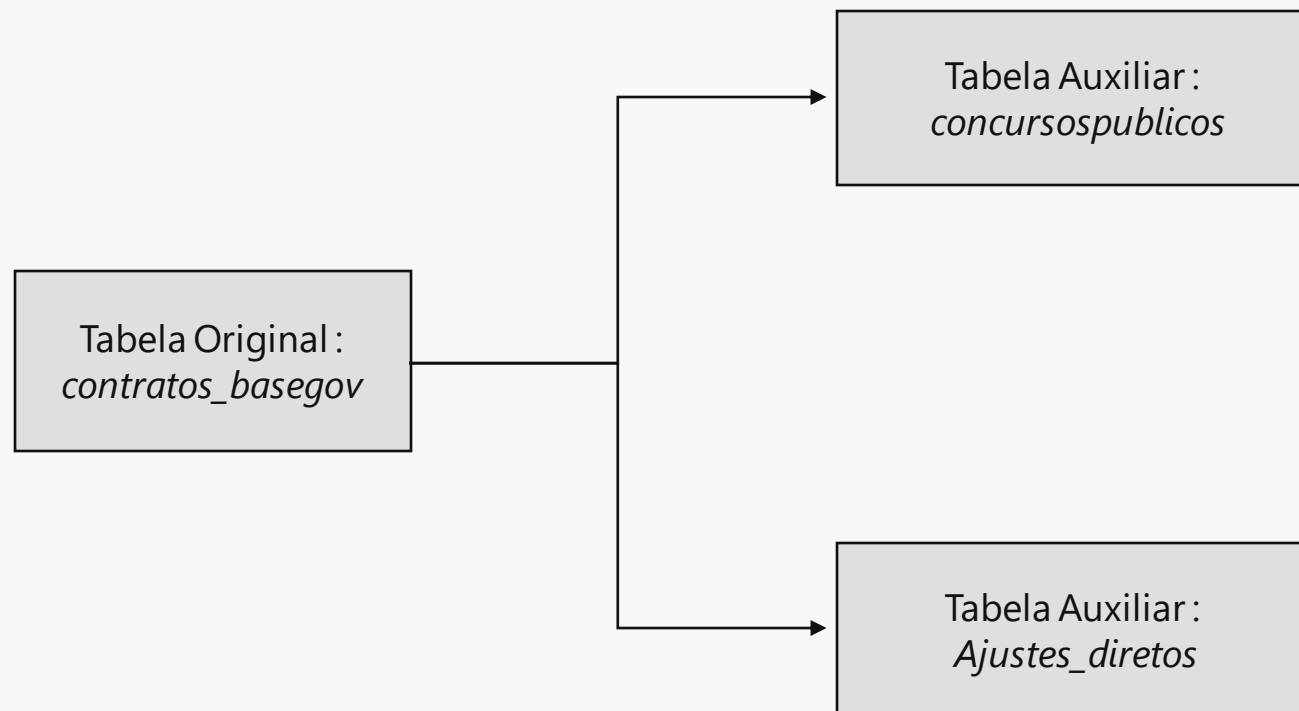
df : dataframe que contém todos os contratos públicos. Necessitamos deste parâmetro para usar  
na função racio( )

Return :

f : tuplo com os id's dos contratos com flag associada

```
"""
```

# Tabelas Adicionais

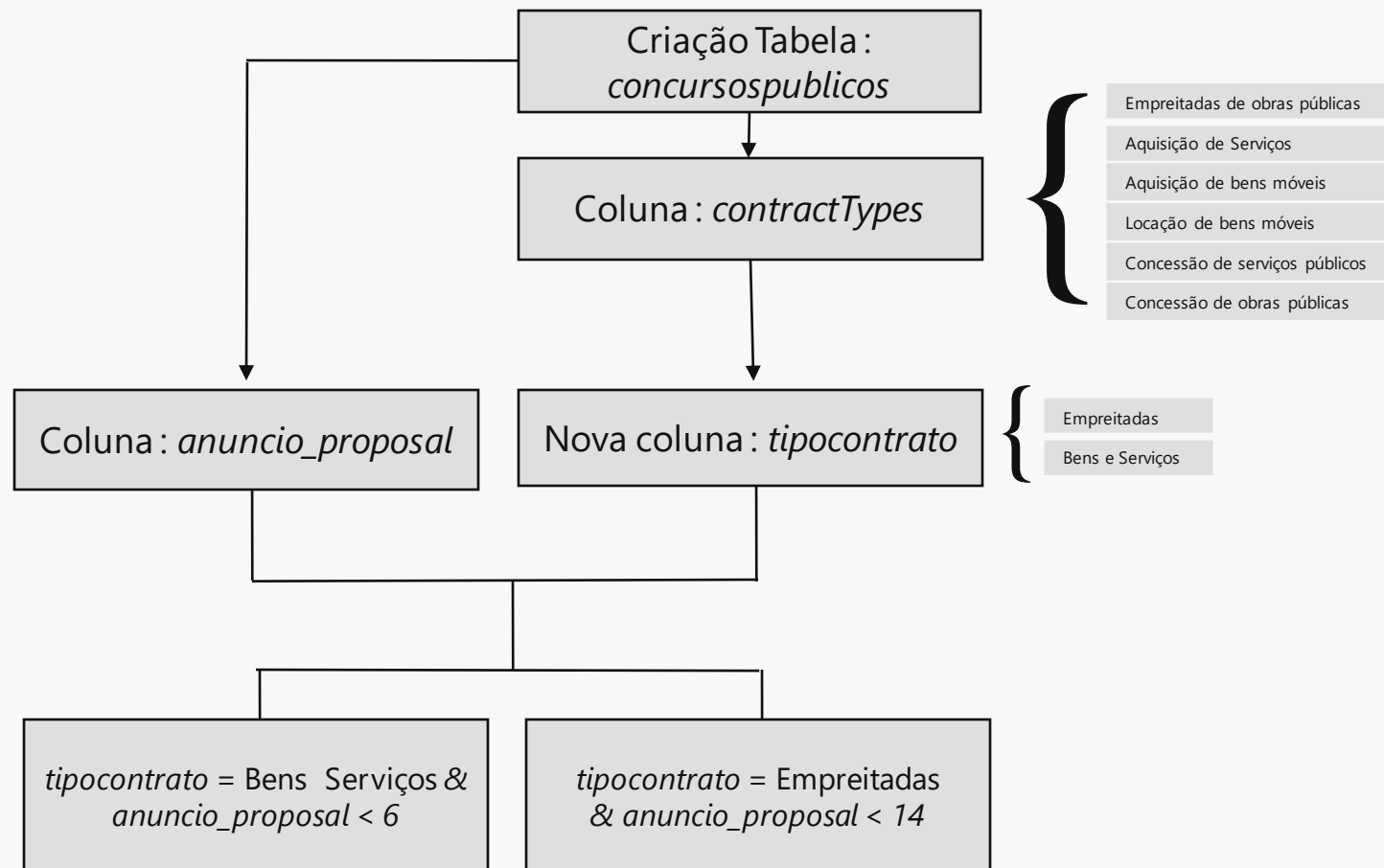


# R003: Short or inadequate notice to bidders to submit expressions of interest or bids

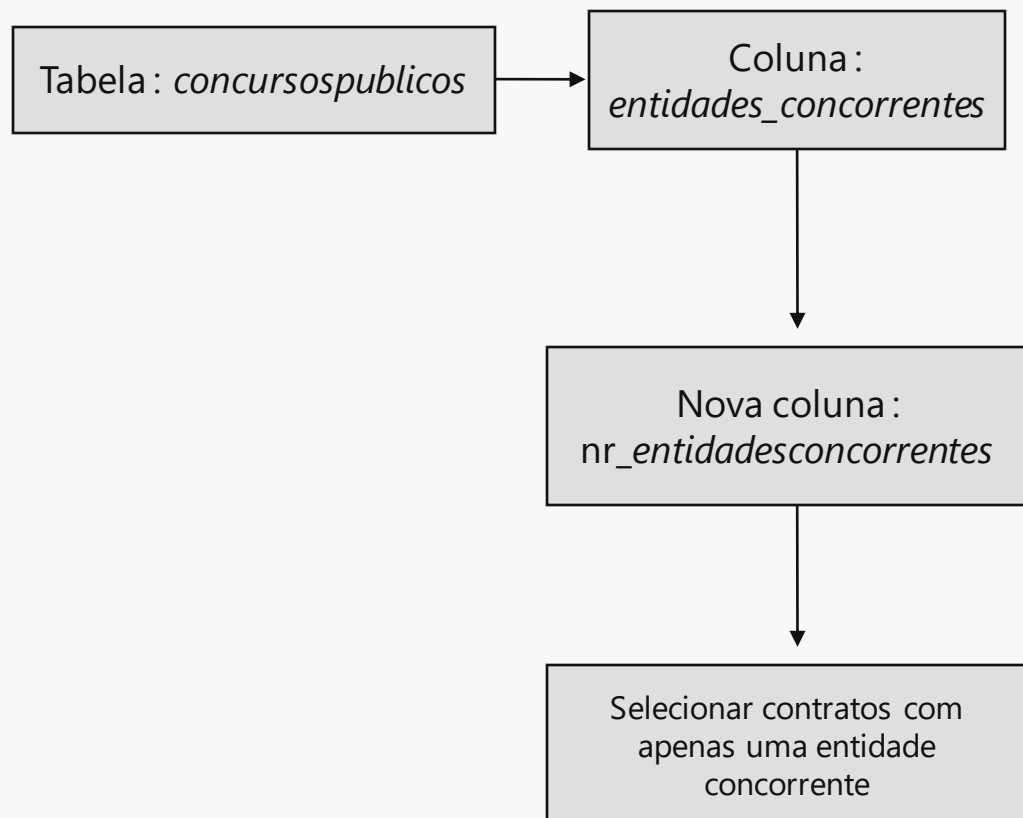
Tipo de Procedimento	Tipo de Contrato	Prazo mínimo
Concurso Público	Bens e Serviços	6 dias
	Empreitadas de Obras Públicas	14 dias

**Artigo 135.º Código dos Contratos Públicos**

```
SELECT concursospublicos."id"  
FROM concursospublicos  
WHERE tipocontrato = 'Empreitadas' AND anuncio_proposal < 14;  
  
SELECT concursospublicos."id"  
FROM concursospublicos  
WHERE tipocontrato = 'Bens e Serviços' AND anuncio_proposal < 6;
```



# R018 : Sing Bid Receive

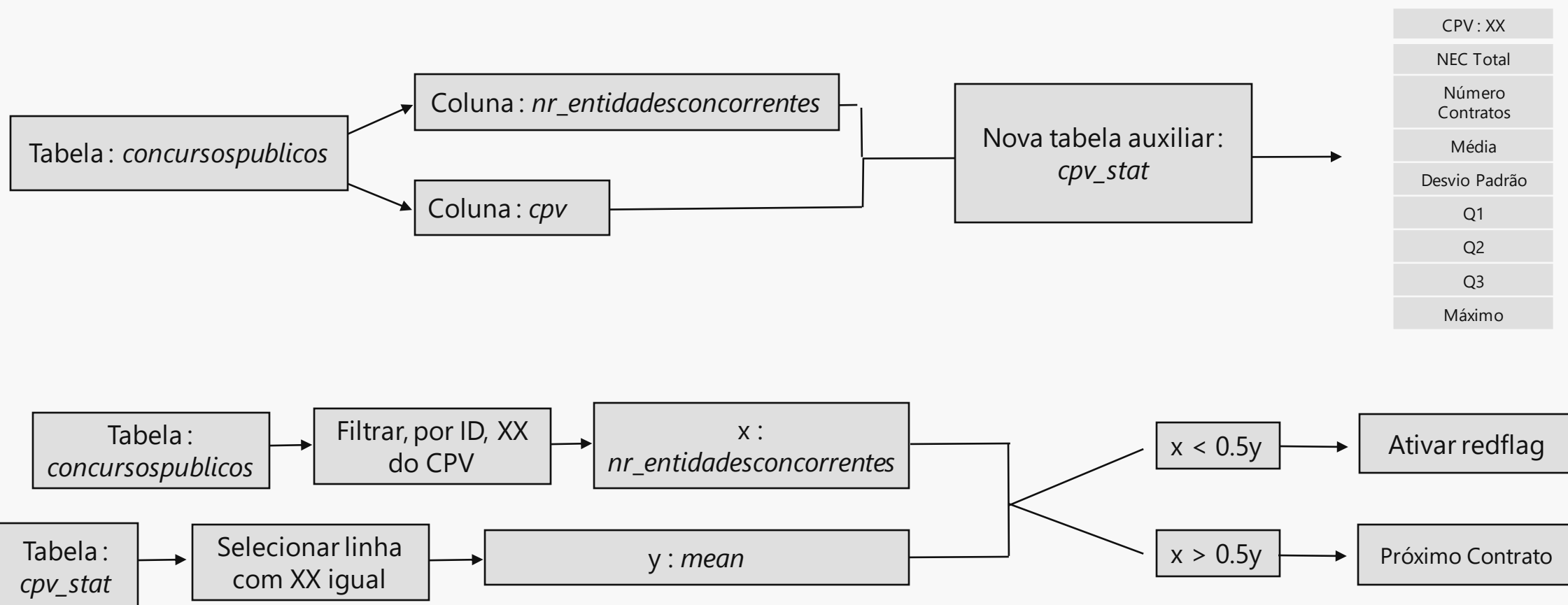


ID	EntidadesConcorrentes
ID <sub>1</sub>	Entidade <sub>i</sub> ( NIF <sub>i</sub> )     Entidade <sub>j</sub> ( NIF <sub>j</sub> )
ID <sub>2</sub>	Entidade <sub>k</sub> ( NIF <sub>k</sub> )
...	...
ID <sub>n</sub>	Entidade <sub>l</sub> ( NIF <sub>l</sub> )     Entidade <sub>m</sub> ( NIF <sub>m</sub> )     Entidade <sub>n</sub> ( NIF <sub>n</sub> )

```
UPDATE concursospublicos
SET nr_entidadesconcorrentes =
    ARRAY_LENGTH(STRING_TO_ARRAY(entidades_concorrentes, '|||', 1) + 1;
```

```
SELECT concursospublicos."id"
FROM concursospublicos
WHERE nr_entidadesconcorrentes = 1;
```

# R019 : Low number of bidders for item and procuring entity





# R019 : Low number of bidders for item and procuring entity

## 1. Criação da Tabela

```
CREATE TABLE cpv_stat1 (  
    cpv double precision,  
    tipocontrato text,  
    nec_t double precision,  
    count double precision,  
    mean double precision,  
    std double precision,  
    min double precision,  
    q1 double precision,  
    q2 double precision,  
    q3 double precision,  
    max double precision  
);
```

## 2. Cálculo Indicadores Estatísticos

```
cur = conn.cursor()  
cur.execute('''  
        SELECT cpv2,  
        concursospublicos."id",  
  
        nr_entidadesconcorrente  
s  
        FROM concursospublicos  
        ORDER BY cpv2 DESC;''')  
  
data = pd.DataFrame(cur.fetchall());  
  
CPV = (data.iloc[:,0].unique())  
  
m = np.zeros([len(CPV),10])  
m[:,0] = CPV  
  
for i,j in enumerate(CPV):  
  
    res = data.loc[data.iloc[:,0] == j,  
        data.columns[2]]  
    m[i,1] = res.values.sum()  
    m[i,2:] = list(res.describe())
```

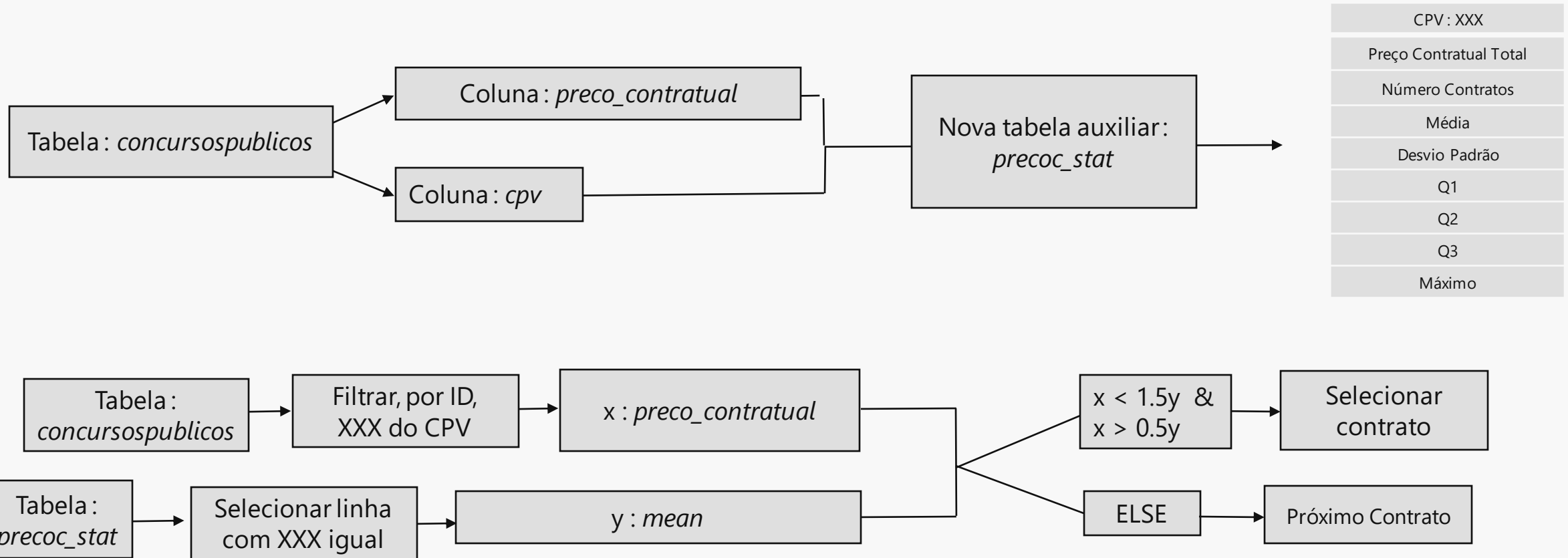
## 3. Escrita dos resultados na tabela

```
table_name = 'cpv_stat'  
column_names = ['cpv', 'nec_t', 'count',  
                'mean', 'std', 'min', 'q1',  
                'q2', 'q3', 'max']  
  
for row in m:  
    insert_query = sql.SQL("INSERT INTO {}  
({})  
        VALUES ({});").format(  
        sql.Identifier(table_name),  
        sql.SQL(',').join(sql.Identifier(name)  
  
        for name in column_names),  
        sql.SQL(',').join(sql.Literal(value)  
        for value in row))  
    cur.execute(insert_query)  
conn.commit()
```

## 4. Query do indicador

```
SELECT concursospublicos."id"  
FROM concursospublicos  
JOIN cpv_stat ON concursospublicos."cpv2" =  
    cpv_stat."cpv"  
WHERE concursospublicos."nr_entidadesconcorrentes"  
    < 0.5 * cpv_stat."mean";
```

## R017 : The difference between an item value and its expected value is above a threshold



# R017 : The difference between an item value and its expected value is above a threshold

## 1. Seleção XXX do CPV

```
cur = conn.cursor()
cur.execute('''
    SELECT DISTINCT(SUBSTRIN
G(cpv,1,3))
    FROM concursospublicos
;''')

cpv3 = [item[0] for item in
cur.fetchall()]
```

## 2. Cálculo e escrita dos indicadores na tabela

```
table_name = 'precoc_stat'
column_names = ['cpv3', 'preco_total', 'count', 'mean', 'std', 'min', 'q1',
'q2', 'q3', 'max']

for i in cpv3:
    cur.execute('''
        SELECT preco_contratual
        FROM concursospublicos
        WHERE SUBSTRING(cpv,1,3) = %s;
        ''', (i,))

    result = pd.DataFrame(cur.fetchall())

    if len(result) > 1:
        row = list((i,result.iloc[:,0].values.sum()))
        row.extend(list(result.iloc[:, 0].describe().values))

        insert_query = sql.SQL("INSERT INTO {} ({{}}) VALUES ({{}});").format(
            sql.Identifier(table_name),
            sql.SQL(',').join(sql.Identifier(name) for name in column_names),
            sql.SQL(',').join(sql.Literal(value) for value in row)
        )
        cur.execute(insert_query)

conn.commit()
```

## 3. Query do indicador

```
SSELECT concursospublicos."id", preco_contratual,
        precoc_stat."mean", precoc_stat."std",
        precoc_stat."cpv3", cpv

FROM concursospublicos

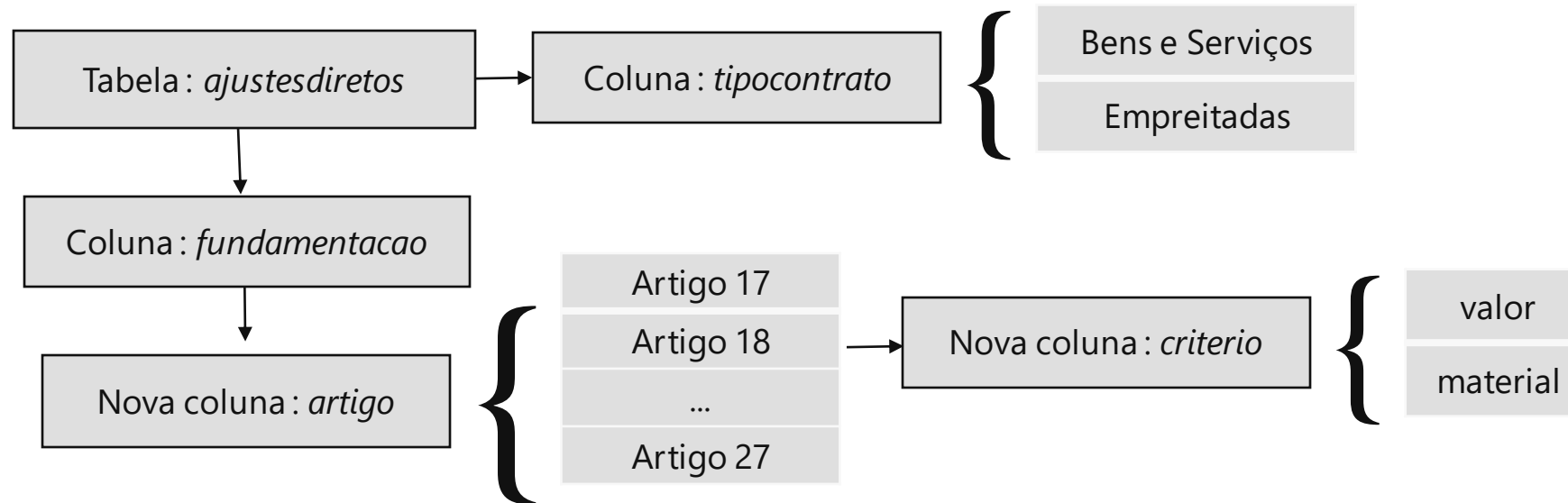
JOIN precoc_stat ON
        SUBSTRING(concursospublicos."cpv",1,3)
        = precoc_stat.cpv3

WHERE concursospublicos.preco_contratual < 1.5 *
        precoc_stat.mean AND
        concursospublicos.preco_contratual > 0.5 *
        precoc_stat.mean;
```

## RF1 : Verificar cumprimento dos preços máximos permitidos em Ajustes Diretos em Regime Geral

<b>Critério</b>	<b>Artigos</b>	<b>Tipo de Contrato</b>	<b>Valor</b>
Critério do Valor	17º a 22º	Aquisição de bens móveis e serviços	20000€
		Empreitadas de obras públicas	30000 €
		Outro tipo de contratos	50000 €
Critério Material	24º a 27º	Qualquer	Indefinido

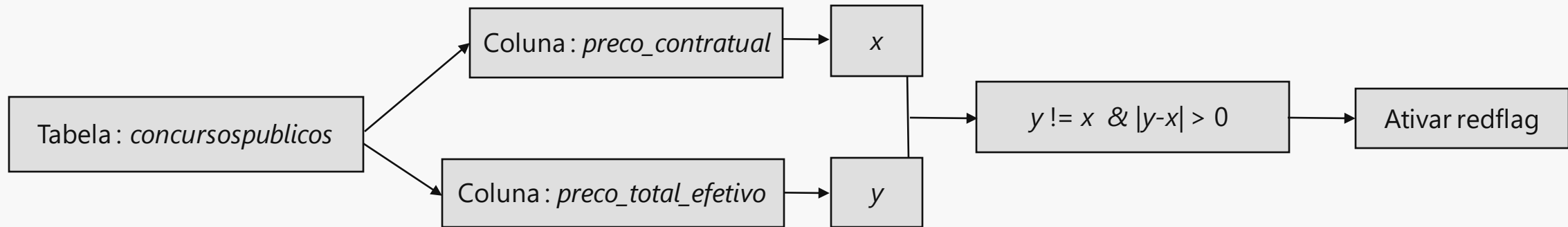
## RF1 : Verificar cumprimento dos preços máximos permitidos em Ajustes Diretos em Regime Geral



```
SELECT * FROM ajustesdiretos
WHERE criterio = 'valor' AND (tipocontrato = 'Bens e Serviços' AND preco > 20000);

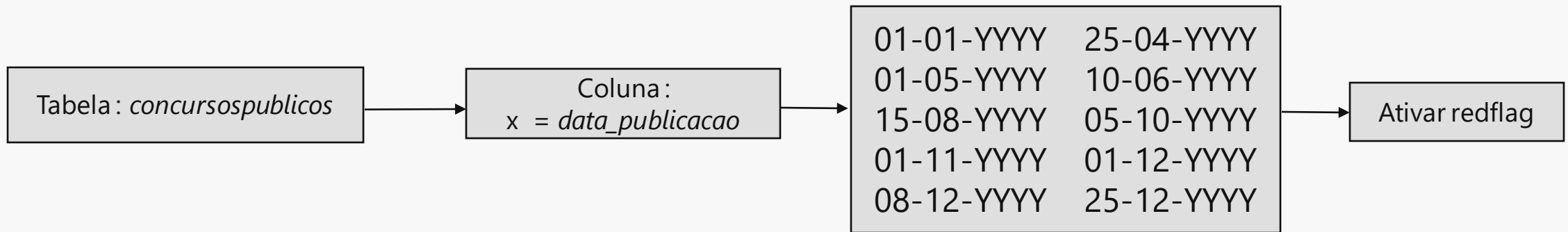
SELECT * FROM ajustesdiretos
WHERE criterio = 'valor' AND (tipocontrato = 'Empreitadas' AND preco > 30000);
```

## RF2 : Verificar alterações do Preço Contratual após celebração do contrato



```
SELECT concursospublicos."id"  
FROM concursospublicos  
WHERE preco_total_efetivo > 0 AND ABS(preco_total_efetivo - preco_contratual) > 0;
```

## RF3 : Verificar data de publicação do anúncio



```
SELECT concursospublicos."id"  
FROM concursospublicos  
WHERE TO_CHAR(data_publicacao, 'MM-DD') IN  
      ('01-01', '04-25', '05-01', '06-10', '08-15',  
       '10-05', '11-01', '12-01', '12-08', '12-25');
```

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# Trabalho Futuro

- Finalizar as restantes flags propostas
- Generalizar as *queries* de forma a que vão buscar os contratos à tabela original *contratos\_basegov*



FORCERA

