

# CDB: calFibreQuality

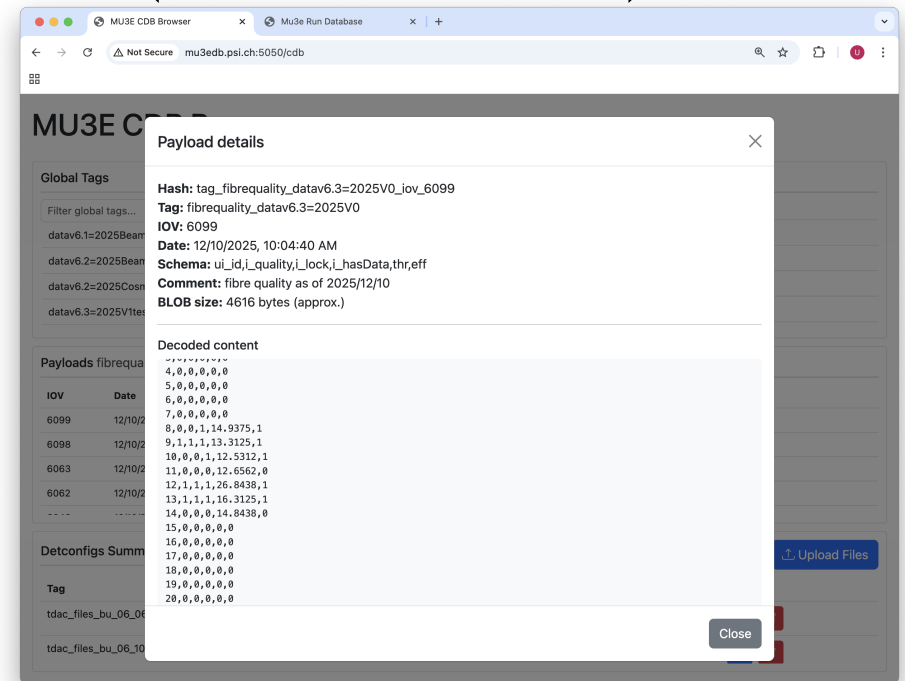
- calFibreQuality

- ▶ indexed by ASIC (active in 2025: 8, . . . , 15)
  - different from tiles (are indexed by channel)
- ▶ includes (per ASIC)
  - has\_data
  - lock
  - threshold
- ▶ payload contents from Marius, 2+95 iovs (runs 3481 . . . 6099)
- ▶ included in **datav6.3=2025V0**

⇒ Somebody should put this to use in mu3eTrirec or elsewhere :-)

- Accessors

```
// -- direct accessors
Status getAsicStatus(uint32_t asicID);
bool   getAsicLock(uint32_t asicID);
bool   getAsicHasData(uint32_t asicID);
int     getAsicQuality(uint32_t asicID);
double getAsicThreshold(uint32_t asicID);
double getAsicEfficiency(uint32_t asicID);
```



# CDB: calPixelEfficiency

- calPixelEfficiency

- ▶ thanks to Haris for preparatory work
- ▶ indexed by global chipID
- ▶  $n$  efficiencies for the entire sensor ( $n$  is not fixed for indiscriminate access)
- ▶ 3 payloads unphysical numbers (1., 0., pattern)
- ▶ included in `datav6.3=2025V0`

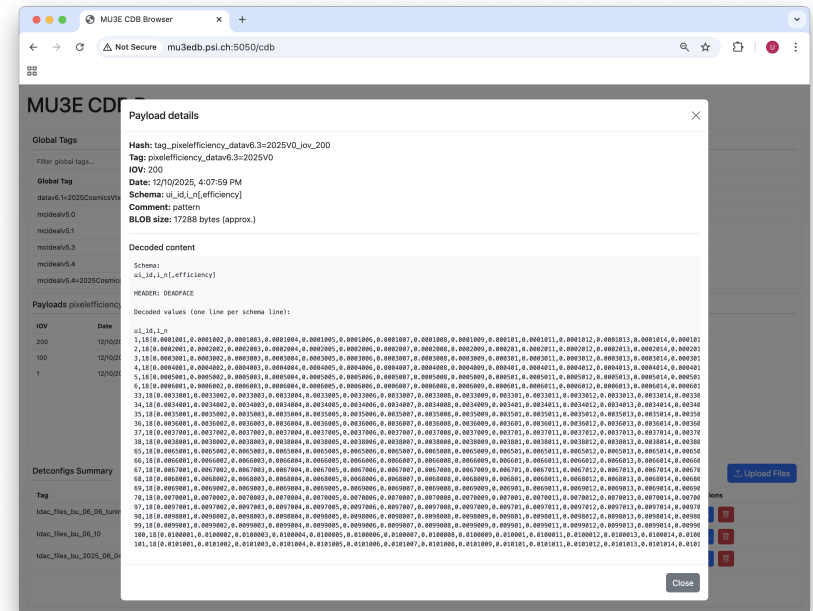
- To be filled with real numbers

- ▶ ideally with some run dependence (else you don't really need the CDB :-)

- Accessors

- ▶ possibly more descriptive :-)

```
// -- direct accessors
double efficiency(uint32_t id,
                 int i/*i = 0 .. 17*/);
```



# cdbWritePayload

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- mu3eUtil/cdb/test/cdbWritePayload.cpp

- ▷ can read directly from alignment/sensors

- ▷ can read directly from alignment/mppcs

- rest will follow (eventually)

- ▷ Usage example

```
./bin/cdbWritePayload -c mppcalignment -g testdevroot -j ~/data/mu3e/cdb/ \  
-f ~/mu3e/software/mu3e/run/mu3e_alignment.root
```

see code for documentation

# (In case it's not obvious . . . )

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- Access to and usage of CDB "cal" classes

```
// from mu3eTrirec/src/mu3e/rec/SiDet.cpp
#include "mu3e/tools/cdb.h" //???
if(auto cal = mu3e::cdbCal<calPixelAlignment>("pixelalignment_")) {
    uint32_t calId = 0;
    cal->resetIterator();
    while(cal->getNextID(calId)) {
        entry.vars.clear();
        entry.id = cal->id(calId);
        entry.vx = cal->vx(calId);
        entry.vy = cal->vy(calId);
    }
}
.. snip ..

// from mu3eSim/sort/mu3eSort.cpp
calPixelQualityLM* midPixelQuality = mu3e::cdbCal<calPixelQualityLM>("pixelqualitylm_");
.. snip ..

if(midPixelQuality != nullptr
    && calPixelQualityLM::Good !=
    midPixelQuality->getLinkStatus(hitId.sensorId.value(), hitId.linkId()))
{
    if(mu3e::conf.verbose >= 3) {
        MU3E_WARN("skip non-good link hit 0x%08X, link =
                  %d\n", hitId.value(), hitId.linkId());
    }
    continue;
}
.. snip ..
```

- If desired, a python api/interface to the CDB is likely very easy

# Pixel quality

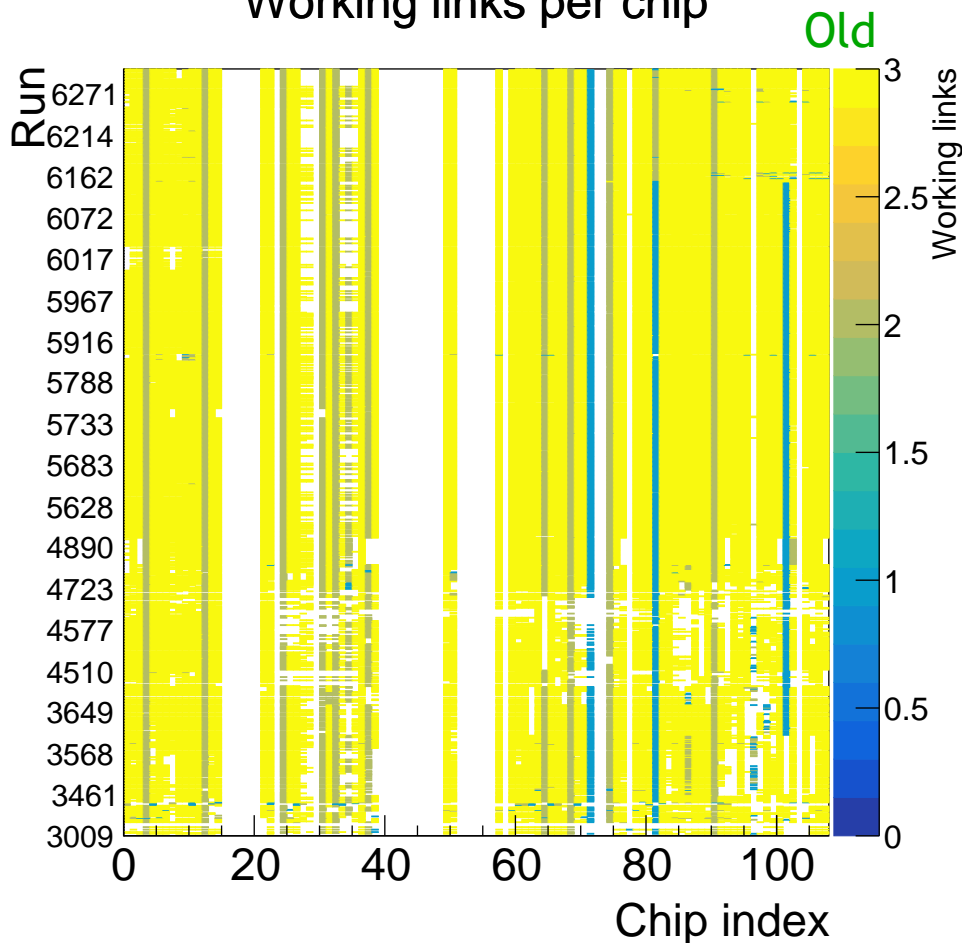
- Starting point (TS): Ignore the "E" label

- only look at the LVDS error rate

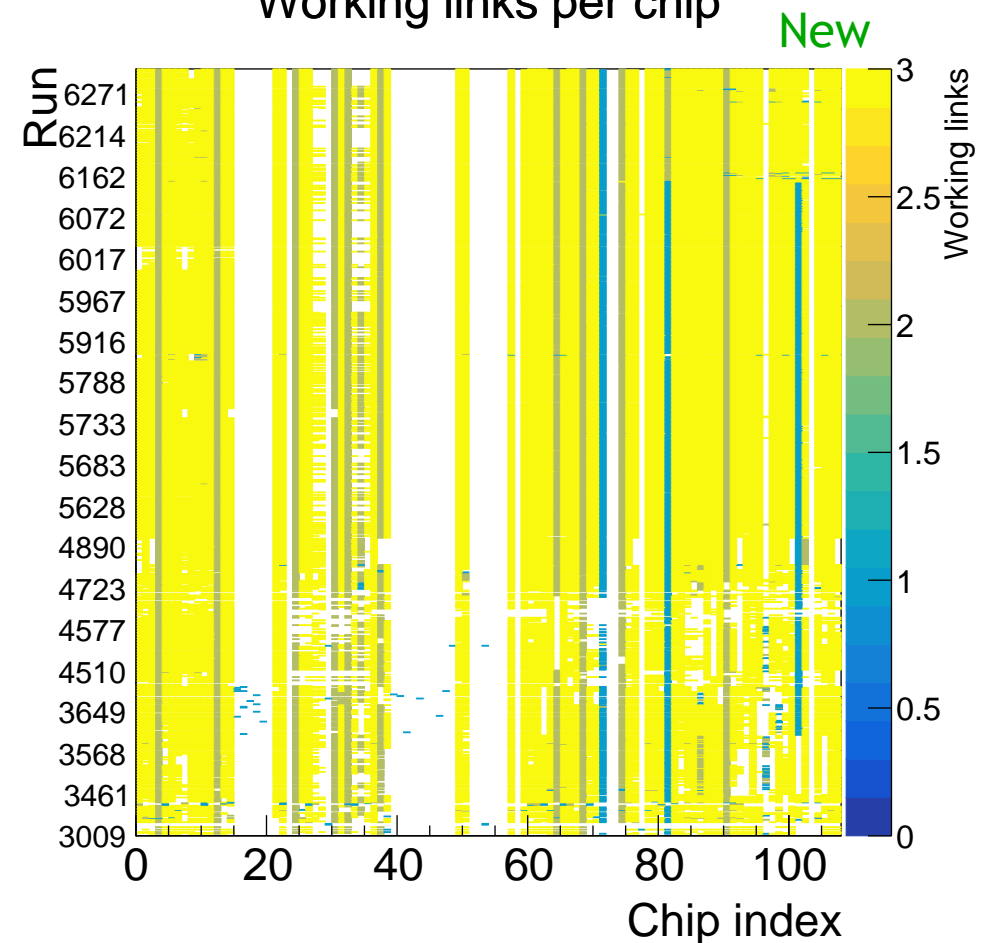
- only very minor changes

(if you worry about LVDS errors, you can extract the hitmap overflow [rate] for yet another handle)

Working links per chip

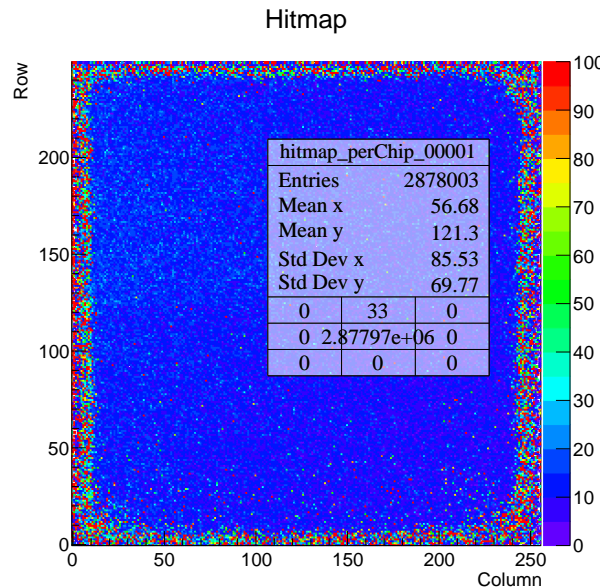


Working links per chip



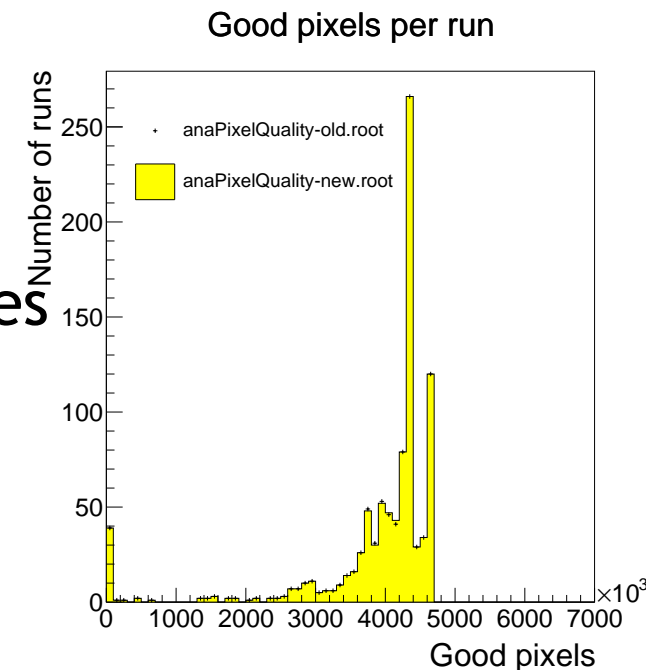
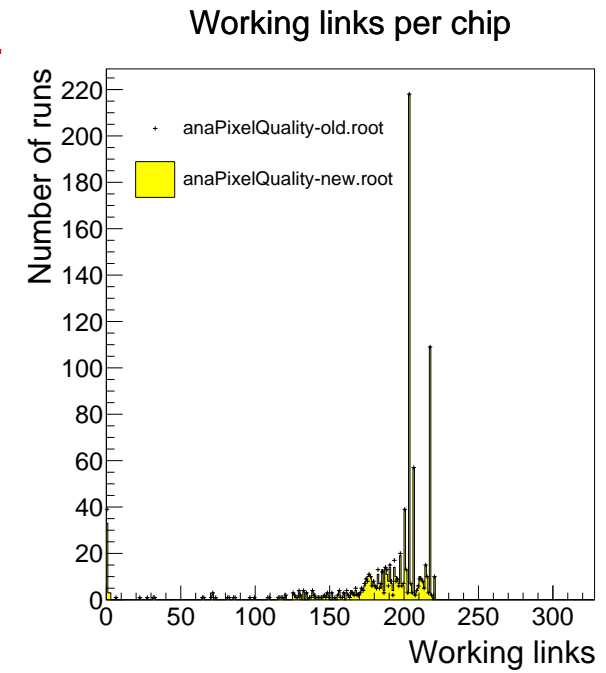
# Pixel Quality II

- Deployed to all instances
  - ▷ replaces the (old) datav6.3=2025V0 payloads
- hitmap overflows (random example):



- $r = \text{\#overflow hits} / \text{\#hits with legal addresses}$ 
  - ▷ store inverse in uint\_32 "ui\_linkM"
  - ▷ if  $r > 0.1$  rounding inaccuracies
  - ▷ accessor

```
double getLVDSOverflowRate(unsigned int chipid);
```



# RDB: Changes to significant run list

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- No changes
  - ▷ all tiles and fibres good runs are also significant runs

- Jak's "good run" list for vertex updated in RDB
  - ▷ now contains

6116,5102,4900,4899,4898,4897,4896,4894,4893,4892,4891,4890,4889,4888,  
4887,4886,4885,4884,4883,4882,4881,4880,4878,4877,4876,4873,4872,4871,  
4870,4869,4868,4866,4865,4864,4863,4758,4757,4756,4748,4746,4745,4744,  
4743,4742,4740,4739,4728,4727,4726,4725,4724,3822,3820,3819,3818,3817,  
3816,3815,3814,3813,3812,3799,3798,3797,3796,3795,3794,3657,3653,3652,  
3651,3649,3646,3645,3644,3642,3638,3637,3636,3635,3634,3633,3629,3627,  
3625,3624,3622,3620,3619,3606,3604,3603,3602,3586,3585,3583,3582,3581,  
3578,3576,3575,3574,3568,3514,3504,3503,3502,3501,3500,3499,3498,3497,  
3496,3495,3494,3493,3492,3488,3487,3475,3474,3472,3471,3416,3312

- ▷ still no overlap with tiles or fibres
- ▷ 48 runs overlap if you select "Not Bad" for vertex  
("bad": less than 1M good pixels or more than 40 chips with 3 bad links)

# RDB - pagination

- RDB issue with large number of runs "Max runs (limit)"

⇒ pagination

The screenshot shows the Mu3e Run Database web interface. The browser address bar indicates the URL: `mu3edb.psi.ch:5050/rdb/?page=3`. The page title is "Mu3e Run Database".

Filters and controls at the top include:

- Significant Runs only: ☒
- Run class: **All classes** (dropdown)
- Run range: min  max
- Max runs:  limit
- Search comments:  search in comments
- Apply Filters button

Below the filters is a yellow bar labeled "Data Quality Filters" with a dropdown arrow.

The main content area shows "Showing 2001 - 3000 of 3598 runs (Page 3 of 4) (significant runs only)".

Run	Start time	End time	Sig.	Class	Events	Shift crew	Shift Comments/RunInfo Comments	Resources
<a href="#">7282</a>	Fri Aug 15 15:49:10 2025	Fri Aug 15 15:52:11 2025	✓	Cosmic	8536	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>
<a href="#">7281</a>	Fri Aug 15 15:45:52 2025	Fri Aug 15 15:48:55 2025	✓	Cosmic	7440	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>
<a href="#">7280</a>	Fri Aug 15 15:42:36 2025	Fri Aug 15 15:45:38 2025	✓	Cosmic	7689	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>
<a href="#">7279</a>	Fri Aug 15 15:39:19 2025	Fri Aug 15 15:42:21 2025	✓	Cosmic	10895	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>
<a href="#">7278</a>	Fri Aug 15 15:36:03 2025	Fri Aug 15 15:39:04 2025	✓	Cosmic	7711	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>
<a href="#">7277</a>	Fri Aug 15 15:32:46 2025	Fri Aug 15 15:35:48 2025	✓	Cosmic	8866	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>
<a href="#">7276</a>	Fri Aug 15 15:29:30 2025	Fri Aug 15 15:32:31 2025	✓	Cosmic	9962	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>
<a href="#">7275</a>	Fri Aug 15 15:26:14 2025	Fri Aug 15 15:29:15 2025	✓	Cosmic	9629	MS, HM	Vertex: Tune 2 ThHigh 120 mask edges, No Beam - COSMICS	<a href="#">ov</a>

Navigation controls at the bottom of the table include: Previous, 1, 2, 3, 4, Next, and Page size: 1000.

Below the table is a green bar labeled "Run Numbers (CSV)".

Below the CSV bar are radio buttons for "Current page only" (selected) and "All filtered runs (3598)".

At the bottom, a long list of run numbers is displayed, starting with 7282, 7281, 7280, 7279, 7278, 7277, 7276, 7275, 7274, 7273, 7272, 7271, 7270, 7269, 7268, 7267, 7266, 7265, 7264, 7263, 7262, 7261, 7260, 7259, 7258, 7257, 7256, 7255, 7254, 7253, 7252, 7251, 7250, 7249, 7248, 7247, 7246, 7245, 7244, 7243, 7242, 7241, 7240, 7239, 7238, 7237, 7236, 7235, 7234, 7233, 7232, 7231, 7230, 7229, 7228, 7227, 7226, 7225, 7224, 7223, 7222, 7221, 7220, 7219, 7218, 7217, 7216, 7215, 7214, 7213, 7212, 7211, 7210, 7209, 7208, 7207, 7206, 7205, 7204, 7203, 7202, 7201, 7200, 7199, 7198, 7197, 7196, 7195, 7194, 7193, 7192, 7191, 7190, 7189, 7188, 7187, 7186, 7185, 7184, 7183, 7182, 7181, 7180, 7179, 7178, 7177, 7176, 7175, 7174, 7173, 7172, 7171, 7170, 7169, 7168, 7167, 7166, 7165, 7164, 7163, 7162, 7161, 7160, 7159, 7158, 7157, 7156, 7155, 7154, 7153, 7152, 7151, 7150, 7149, 7148, 7147, 7146, 7145, 7144, 7143, 7142, 7141, 7140, 7139, 7138, 7137, 7136, 7135, 7134, 7133, 7132, 7131, 7130, 7129, 7128, 7127, 7126, 7125, 7124, 7123, 7122, 7121, 7120, 7119, 7118, 7117, 7116, 7115, 7114, 7113, 7112, 7111, 7110, 7109, 7108, 7107, 7106, 7105, 7104, 7103, 7102, 7101, 7100, 7099, 7098, 7097, 7096, 7095, 7094, 7093, 7092, 7091, 7090, 7089, 7088, 7087, 7086, 7085, 7084, 7083, 7082, 7081, 7080, 7079, 7078, 7077, 7076, 7075, 7074, 7073, 7072, 7071, 7070, 7069, 7068, 7067, 7066, 7065, 7064, 7063, 7062, 7061, 7060, 7059, 7058, 7057, 7056, 7055, 7054, 7053, 7052, 7051, 7050, 7049, 7048, 7047, 7046, 7045, 7044, 7043, 7042, 7041, 7040, 7039, 7038, 7037, 7036, 7035, 7034, 7033, 7032, 7031, 7030, 7029, 7028, 7027, 7026, 7025, 7024, 7023, 7022, 7021, 7020, 7019, 7018, 7017, 7016, 7015, 7014, 7013, 7012, 7011, 7010, 7009, 7008, 7007, 7006, 7005, 7004, 7003, 7002, 7001, 7000, 6999, 6998, 6997, 6996, 6995, 6994, 6993, 6992, 6991, 6990, 6989, 6988, 6987, 6986, 6985, 6984, 6983, 6982, 6981, 6980, 6979, 6978, 6977, 6976, 6975, 6974, 6973, 6972, 6971, 6970, 6969, 6968, 6967, 6966, 6965, 6964, 6963, 6962, 6961, 6960, 6959, 6958, 6957, 6956, 6955, 6954, 6953, 6952, 6951, 6950, 6949, 6948, 6947, 6946, 6945, 6944, 6943, 6942, 6941, 6940, 6939, 6938, 6937, 6936, 6935, 6934, 6933, 6932, 6931, 6930, 6929, 6928, 6927, 6926, 6925, 6924, 6923, 6922, 6921, 6920, 6919, 6918, 6917, 6916, 6915, 6914, 6913, 6912, 6911, 6910, 6909, 6908, 6907, 6906, 6905, 6904, 6903, 6902, 6901, 6900, 6899, 6898, 6897, 6896, 6895, 6894, 6893, 6892, 6891, 6890, 6889, 6888, 6887, 6886, 6885, 6884, 6883, 6882, 6881, 6880, 6879, 6878, 6877, 6876, 6875, 6874, 6873, 6872, 6871, 6870, 6869, 6868, 6867, 6866, 6865, 6864, 6863, 6862, 6861, 6860, 6859, 6858, 6857, 6856, 6855, 6854, 6853, 6852, 6851, 6850, 6849, 6848, 6847, 6846, 6845, 6844, 6843, 6842, 6841, 6840, 6839, 6838, 6837, 6836, 6835, 6834, 6833, 6832, 6831, 6830, 6829, 6828, 6827, 6826, 6825, 6824, 6823, 6822, 6821, 6820, 6819, 6818, 6817, 6816, 6815, 6814, 6813, 6812, 6811, 6810, 6809, 6808, 6807, 6806, 6805, 6804, 6803, 6802, 6801, 6800, 6799, 6798, 6797, 6796, 6795, 6794, 6793, 6792, 6791, 6790, 6789, 6788, 6787, 6786, 6785, 6784, 6783, 6782, 6781, 6780, 6779, 6778, 6777, 6776, 6775, 6774, 6773, 6772, 6771, 6770, 6769, 6768, 6767, 6766, 6765, 6764, 6763, 6762, 6761, 6760, 6759, 6758, 6757, 6756, 6755, 6754, 6753, 6752, 6751, 6750, 6749, 6748, 6747, 6746, 6745, 6744, 6743, 6742, 6741, 6740, 6739, 6738, 6737, 6736, 6735, 6734, 6733, 6732, 6731, 6730, 6729, 6728, 6727, 6726, 6725, 6724, 6723, 6722, 6721, 6720, 6719, 6718, 6717, 6716, 6715, 6714, 6713, 6712, 6711, 6710, 6709, 6708, 6707, 6706, 6705, 6704, 6703, 6702, 6701, 6700, 6699, 6698, 6697, 6696, 6695, 6694, 6693, 6692, 6691, 6690, 6689, 6688, 6687, 6686, 6685, 6684, 6683, 6682, 6681, 6680, 6679, 6678, 6677, 6676, 6675, 6674, 6673, 6672, 6671, 6670, 6669, 6668, 6667, 6666, 6665, 6664, 6663, 6662, 6661, 6660, 6659, 6658, 6657, 6656, 6655, 6654, 6653, 6652, 6651, 6650, 6649, 6648, 6647, 6646, 6645, 6644, 6643, 6642, 6641, 6640, 6639, 6638, 6637, 6636, 6635, 6634, 6633, 6632, 6631, 6630, 6629, 6628, 6627, 6626, 6625, 6624, 6623, 6622, 6621, 6620, 6619, 6618, 6617, 6616, 6615, 6614, 6613, 6612, 6611, 6610, 6609, 6608, 6607, 6606, 6605, 6604, 6603, 6602, 6601, 6600, 6599, 6598, 6597, 6596, 6595, 6594, 6593, 6592, 6591, 6590, 6589, 6588, 6587, 6586, 6585, 6584, 6583, 6582, 6581, 6580, 6579, 6578, 6577, 6576, 6575, 6574, 6573, 6572, 6571, 6570, 6569, 6568, 6567, 6566, 6565, 6564, 6563, 6562, 6561, 6560, 6559, 6558, 6557, 6556, 6555, 6554, 6553, 6552, 6551, 6550, 6549, 6548, 6547, 6546, 6545, 6544, 6543, 6542, 6541, 6540, 6539, 6538, 6537, 6536, 6535, 6534, 6533, 6532, 6531, 6530, 6529, 6528, 6527, 6526, 6525, 6524, 6523, 6522, 6521, 6520, 6519, 6518, 6517, 6516, 6515, 6514, 6513, 6512, 6511, 6510, 6509, 6508, 6507, 6506, 6505, 6504, 6503, 6502, 6501, 6500, 6499, 6498, 6497, 6496, 6495, 6494, 6493, 6492, 6491, 6490, 6489, 6488, 6487, 6486, 6485, 6484, 6483, 6482, 6481, 6480, 6479, 6478, 6477, 6476, 6475, 6474, 6473, 6472, 6471, 6470, 6469, 6468, 6467, 6466, 6465, 6464, 6463, 6462, 6461, 6460, 6459, 6458, 6457, 6456, 6455, 6454, 6453, 6452, 6451, 6450, 6449, 6448, 6447, 6446, 6445, 6444, 6443, 6442, 6441, 6440, 6439, 6438, 6437, 6436, 6435, 6434, 6433, 6432, 6431, 6430, 6429, 6428, 6427, 6426, 6425, 6424, 6423, 6422, 6421, 6420, 6419, 6418, 6417, 6416, 6415, 6414, 6413, 6412, 6411, 6410, 6409, 6408, 6407, 6406, 6405, 6404, 6403, 6402, 6401, 6400, 6399, 6398, 6397, 6396, 6395, 6394, 6393, 6392, 6391, 6390, 6389, 6388, 6387, 6386, 6385, 6384, 6383, 6382, 6381, 6380, 6379, 6378, 6377, 6376, 6375, 6374, 6373, 6372, 6371, 6370, 6369, 6368, 6367, 6366, 6365, 6364, 6363, 6362, 6361, 6360, 6359, 6358, 6357, 6356, 6355, 6354, 6353, 6352, 6351, 6350, 6349, 6348, 6347, 6346, 6345, 6344, 6343, 6342, 6341, 6340, 6339, 6338, 6337, 6336, 6335, 6334, 6333, 6332, 6331, 6330, 6329, 6328, 6327, 6326, 6325, 6324, 6323, 6322, 6321, 6320, 6319, 6318, 6317, 6316, 6315, 6314, 6313, 6312, 6311, 6310, 6309, 6308, 6307, 6306, 6305, 6304, 6303, 6302, 6301, 6300, 6299, 6298, 6297, 6296, 6295, 6294, 6293, 6292, 6291, 6290, 6289, 6288, 6287, 6286, 6285, 6284, 6283, 6282, 6281, 6280, 6279, 6278, 6277, 6276, 6275, 6274, 6273, 6272, 6271, 6270, 6269, 6268, 6267, 6266, 6265, 6264, 6263, 6262, 6261, 6260, 6259, 6258, 6257, 6256, 6255, 6254, 6253, 6252, 6251, 6250, 6249, 6248, 6247, 6246, 6245, 6244, 6243, 6242, 6241, 6240, 6239, 6238, 6237, 6236, 6235, 6234, 6233, 6232, 6231, 6230, 6229, 6228, 6227, 6226, 6225, 6224, 6223, 6222, 6221, 6220, 6219, 6218, 6217, 6216, 6215, 6214, 6213, 6212, 6211, 6210, 6209, 6208, 6207, 6206, 6205, 6204, 6203, 6202, 6201, 6200, 6199, 6198, 6197, 6196, 6195, 6194, 6193, 6192, 6191, 6190, 6189, 6188, 6187, 6186, 6185, 6184, 6183, 6182, 6181, 6180, 6179, 6178, 6177, 6176, 6175, 6174, 6173, 6172, 6171, 6170, 6169, 6168, 6167, 6166, 6165, 6164, 6163, 6162, 6161, 6160, 6159, 6158, 6157, 6156, 6155, 6154, 6153, 6152, 6151, 6150, 6149, 6148, 6147, 6146, 6145, 6144, 6143, 6142, 6141, 6140, 6139, 6138, 6137, 6136, 6135, 6134, 6133, 6132, 6131, 6130, 6129, 6128, 6127, 6126, 6125, 6124, 6123, 6122, 6121, 6120, 6119, 6118, 6117, 6116, 6115, 6114, 6113, 6112, 6111, 6110, 6109, 6108, 6107, 6106, 6105, 6104, 6103, 6102, 6101, 6100, 6099, 6098, 6097, 6096, 6095, 6094, 6093, 6092, 6091, 6090, 6089, 6088, 6087, 6086, 6085, 6084, 6083, 6082, 6081, 6080, 6079, 6078, 6077, 6076, 6075, 6074, 6073, 6072, 6071, 6070, 6069, 6068, 6067, 6066, 6065, 6064, 6063, 6062, 6061, 6060, 6059, 6058, 6057, 6056, 6055, 6054, 6053, 6052, 6051, 6050, 6049, 6048, 6047, 6046, 6045, 6044, 6043, 6042, 6041, 6040, 6039, 6038, 6037, 6036, 6035, 6034, 6033, 6032, 6031, 6030, 6029, 6028, 6027, 6026, 6025, 6024, 6023, 6022, 6021, 6020, 6019, 6018, 6017, 6016, 6015, 6014, 6013, 6012, 6011, 6010, 6009, 6008, 6007, 6006, 6005, 6004, 6003, 6002, 6001, 6000, 5999, 5998, 5997, 5996, 5995, 5994, 5993, 5992, 5991, 5990, 5989, 5988, 5987, 5986, 5985, 5984, 5983, 5982, 5981, 5980, 5979, 5978, 5977, 5976, 5975, 5974, 5973, 5972, 5971, 5970, 5969, 5968, 5967, 5966, 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