

ox_pari

Risa/Asir ox_pari server
1.0 版
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by Risa/Asir committers

1 About ox_pari

The ox_pari is an OpenXM server for the number theory system pari. Pari functions can be called as

```
pari(function name, argument 1, ...);
```

The function names which can be called by the OpenXM are listed in the next chapter.

Pari/gp is a system for the number theory developed at Bordeaux university. See the following web page.

- [pari-gp] <http://pari.math.u-bordeaux.fr/index.html>

2 ox_pari functions

2.1 ox_pari

`pari(func, arg1, arg2, ...)`
 :: Call the pari function *func*.

return Result by the pari function.

argn Argument for the pari function.

- ox_pari server starts automatically when the user calls the pari function first time. The number number can be obtained by `ctrl("oxpari_id")` or `ox_get_serverinfo()`. In order to interrupt ox_pari or shutdown ox_pari, use `ox_reset(server number)` and `ox_shutdown(server number)` respectively. As to these functions, refer to the Risa/Asir manual (see, e.g., documents of <http://www.openxm.org>).
- pari library functions are described in <https://pari.math.u-bordeaux.fr/dochtml/html/>
- The pari library listed below can be called from Risa/Asir. Note that names of library functions are sometimes different with gp function names.

```
/* type=1 : one num/poly/mat arg */
/* type=2 : 1starg=num/poly/mat arg, 2ndarg=0(flag) */
```

```
struct parif parif_tab[] = {
/* (ulong)allocatemoremem(ulong) */
{"allocatemem", (GEN (*)())allocatemoremem, 0},
/* num/num */
{"abs", gabs, 1},
{"erfc", gerfc, 1},
{"arg", garg, 1},
{"isqrt", racine, 1},
{"gamma", ggamma, 1},
{"zeta", gzeta, 1},
{"floor", gfloor, 1},
{"frac", gfrac, 1},
{"imag", gimag, 1},
{"conj", gconj, 1},
{"ceil", gceil, 1},
{"isprime", gisprime, 2},
{"bigomega", gbigomega, 1},
{"denom", denom, 1},
{"numer", numer, 1},
{"lngamma", glngamma, 1},
{"logagm", glogagm, 1},
{"classno", classno, 1},
{"dilog", dilog, 1},
{"disc", discsr, 1},
{"discf", discf, 1},
{"nextprime", nextprime, 1},
{"eintg1", eint1, 1},
{"eta", eta, 1},
{"issqfree", gissquarefree, 1},
{"issquare", gcarreparfait, 1},
{"gamh", ggamd, 1},
```

```

{"hclassno", classno3, 1},

/* num/array */
{"binary", binaire, 1},
{"factorint", factorint, 2},
{"factor", Z_factor, 1},
{"cf", gcf, 1},
{"divisors", divisors, 1},
{"smallfact", smallfact, 1},

/* poly/poly */
{"centerlift", centerlift, 1},
{"content", content, 1},

/* poly/array */
{"galois", galois, 1},
{"roots", roots, 1},
{"factpol", factpol, 1},

/* mat/mat */
{"adj", adj, 1},
{"l1l", l1l, 1},
{"l1lgen", l1lgen, 1},
{"l1lgram", l1lgram, 1},
{"l1lgramgen", l1lgramgen, 1},
{"l1lgramint", l1lgramint, 1},
{"l1lgramkerim", l1lgramkerim, 1},
{"l1lgramkerimgen", l1lgramkerimgen, 1},
{"l1lint", l1lint, 1},
{"l1lkerim", l1lkerim, 1},
{"l1lkerimgen", l1lkerimgen, 1},
{"trans", gtrans, 1},
{"eigen", eigen, 1},
{"hermite", hnf, 1},
{"mat", gtomat, 1},
{"matrixqz2", matrixqz2, 1},
{"matrixqz3", matrixqz3, 1},
{"hess", hess, 1},
{"ker", ker, 1},
{"keri", keri, 1},
{"kerint", kerint, 1},
{"kerintg1", kerint1, 1},

/* mat/poly */
{"det", det, 1},
{"det2", det2, 1},

/* not examined yet */
{"image", image, 1},
{"image2", image2, 1},
{"indexrank", indexrank, 1},
{"indsort", indsort, 1},
{"initalg", initalg, 1},
{"isfund", gisfundamental, 1},
{"ispsp", gispsp, 1},
{"jacobi", jacobi, 1},
{"jell", jell, 1},
{"length", (GEN(*)())glength, 1},

```

```

{"lexsort",lexsort,1},
{"lift",lift,1},
{"lindep",lindep,1},
{"modreverse",polymodrecip,1},
{"mu",gmu,1},
{"norm",gnorm,1},
{"norml2",gnorml2,1},
{"numdiv",numbdiv,1},
{"omega",gomega,1},
{"order",order,1},
{"ordred",ordred,1},
{"phi",phi,1},
{"pnqn",pnqn,1},
{"primroot",gener,1},
{"psi",gpsi,1},
{"quadgen",quadgen,1},
{"quadpoly",quadpoly,1},
{"recip",polrecip,1},
{"redreal",redreal,1},
{"regula",regula,1},
{"reorder",reorder,1},
{"rhoreal",rhoreal,1},
{"sigma",sumdiv,1},
{"signat",signat,1},
{"simplify",simplify,1},
{"smith",smith,1},
{"smith2",smith2,1},
{"sort",sort,1},
{"sqr",gsqr,1},
{"sqred",sqred,1},
{"sqrt",gsqrt,1},
{"supplement",suppl,1},
{"trace",gtrace,1},
{"trunc",gtrunc,1},
{"unit",fundunit,1},
{"wf",wf,1},
{"wf2",wf2,1},
};

```

Example, finding $\text{Ker}(P: \mathbb{Z}^4 \rightarrow \mathbb{Z}^2)$.

```

pari(kerint,P=newmat(2,4,[[1,1,1],[0,1,3,4]]));

```

In order to find a description of `kerint`, please visit <https://pari.math.u-bordeaux.fr/dochtml/html/> (the function name in `gp` is `matkerint`.)

参照

ChangeLog

- The table is in `OpenXM/src/ox_pari/pari_ftab.c`

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