```
AllocateMemory ()

FREQ:4545
<bb 2>:
global_align.0_1 = global_align;
_2 = (long int) global_align.0_1;
_3 = _2 * 2;
_4 = (long unsigned int) _3;
_5 = _4 + nbytes_18(D);
returnval_20 = malloc (_5);
_31 = returnval_20 == 0B;
_30 = (int) _31;
*errorcode_21(D) = _30;
true_addr_24 = (long unsigned int) returnval_20;
global_align.1_6 = global_align;
if (global_align.1_6 == 0)
  goto <bb 3>; [50.00%]
else
  goto <bb 6>; [50.00%]

FREQ:2273
<bb 6>:
if (global_align.1_6 == 1)
  goto <bb 8>; [34.00%]
else
  goto <bb 7>; [66.00%]

FREQ:1500
<bb 7>:
_15 = (long unsigned int) global_align.1_6;
_22 = true_addr_24 % _15;
if (_22 != 0)
  goto <bb 16>; [85.00%]
else
  goto <bb 18>; [15.00%]

FREQ:1275
<bb 16>:

FREQ:8500
<bb 9>:
# adj_addr_43 = PHI <adj_addr_26(17), true_addr_24(16)>
adj_addr_26 = adj_addr_43 + 1;
_8 = adj_addr_26 % _15;
if (_8 != 0)
  goto <bb 17>; [85.00%]
else
  goto <bb 19>; [15.00%]

FREQ:1275
<bb 19>:
goto <bb 10>; [100.00%]

FREQ:225
<bb 18>:

FREQ:7225
<bb 17>:
goto <bb 9>; [100.00%]

FREQ:1500
<bb 10>:
# adj_addr_49 = PHI <adj_addr_26(19), true_addr_24(18)>
_9 = global_align.1_6 * 2;
_10 = (long unsigned int) _9;
_11 = adj_addr_49 % _10;
if (_11 == 0)
  goto <bb 11>; [50.00%]
else
  goto <bb 20>; [50.00%]

FREQ:750
<bb 11>:
adj_addr_25 = _15 + adj_addr_49;

FREQ:750
<bb 20>:
goto <bb 12>; [100.00%]

FREQ:773
<bb 8>:
adj_addr_27 = true_addr_24 + 1;
goto <bb 12>; [100.00%]

FREQ:2273
<bb 3>:
mem_array_ents.7_33 = mem_array_ents;
if (mem_array_ents.7_33 > 19)
  goto <bb 4>; [50.00%]
else
  goto <bb 5>; [50.00%]

FREQ:2273
<bb 12>:
# adj_addr_13 = PHI <adj_addr_27(8), adj_addr_49(20), adj_addr_25(11)>
returnval_28 = (farvoid *) adj_addr_13;
mem_array_ents.7_35 = mem_array_ents;
if (mem_array_ents.7_35 > 19)
  goto <bb 14>; [54.00%]
else
  goto <bb 13>; [46.00%]

FREQ:1136
<bb 5>:
mem_array[0][mem_array_ents.7_33] = true_addr_24;
mem_array[1][mem_array_ents.7_33] = true_addr_24;
_34 = mem_array_ents.7_33 + 1;
mem_array_ents = _34;
goto <bb 15>; [100.00%]

FREQ:1136
<bb 4>:
*errorcode_21(D) = 2;
goto <bb 15>; [100.00%]

FREQ:1045
<bb 13>:
mem_array[0][mem_array_ents.7_35] = true_addr_24;
mem_array[1][mem_array_ents.7_35] = adj_addr_13;
_36 = mem_array_ents.7_35 + 1;
mem_array_ents = _36;
goto <bb 15>; [100.00%]

FREQ:1227
<bb 14>:
*errorcode_21(D) = 2;

FREQ:4545
<bb 15>:
# _14 = PHI <returnval_20(4), returnval_28(14), returnval_28(13), returnval_20(5)>
return _14;
```

```
FreeMemory ()

FREQ:1444
<bb 2>:
adj_addr_5 = (long unsigned int) mempointer_4(D);
mem_array_ents.13_29 = mem_array_ents;
if (mem_array_ents.13_29 > 0)
  goto <bb 3>; [92.50%]
else
  goto <bb 15>; [7.50%]

FREQ:1332
<bb 3>:
_27 = mem_array[1][0];
if (adj_addr_5 == _27)
  goto <bb 16>; [7.50%]
else
  goto <bb 12>; [92.50%]

FREQ:1232
<bb 12>:

FREQ:8560
<bb 8>:
# i_31 = PHI <i_20(14), 0(12)>
i_20 = i_31 + 1;
if (i_20 < mem_array_ents.13_29)
  goto <bb 4>; [92.50%]
else
  goto <bb 20>; [7.50%]

FREQ:7918
<bb 4>:
_13 = mem_array[1][i_20];
if (adj_addr_5 == _13)
  goto <bb 17>; [7.50%]
else
  goto <bb 14>; [92.50%]

FREQ:100
<bb 16>:

FREQ:594
<bb 17>:
_17 = i_20 + 1;
goto <bb 5>; [100.00%]

FREQ:7324
<bb 14>:
goto <bb 8>; [100.00%]

FREQ:694
<bb 5>:
# i_30 = PHI <i_20(17), 0(16)>
# prephitmp_1 = PHI <_17(17), 1(16)>
_14 = mem_array[0][i_30];
if (prephitmp_1 < mem_array_ents.13_29)
  goto <bb 11>; [85.00%]
else
  goto <bb 18>; [15.00%]

FREQ:590
<bb 11>:

FREQ:3931
<bb 6>:
# _32 = PHI <_15(13), prephitmp_1(11)>
# j_33 = PHI <_32(13), i_30(11)>
_16 = mem_array[0][_32];
mem_array[0][j_33] = _16;
_18 = mem_array[1][_32];
mem_array[1][j_33] = _18;
_15 = _32 + 1;
if (_15 < mem_array_ents.13_29)
  goto <bb 13>; [85.00%]
else
  goto <bb 19>; [15.00%]

FREQ:104
<bb 18>:

FREQ:590
<bb 19>:
goto <bb 7>; [100.00%]

FREQ:3341
<bb 13>:
goto <bb 6>; [100.00%]

FREQ:642
<bb 20>:

FREQ:108
<bb 15>:
goto <bb 9>; [100.00%]

FREQ:694
<bb 7>:
_19 = mem_array_ents.13_29 + -1;
mem_array_ents = _19;
mempointer_7 = (farvoid *) _14;
free (mempointer_7);
*errorcode_9(D) = 0;
goto <bb 10>; [100.00%]

FREQ:750
<bb 9>:
*errorcode_9(D) = 3;

FREQ:1444
<bb 10>:
return;
```

```
MoveMemory ()

FREQ:10000
<bb 2>:
__builtin_memmove (destination_2(D), source_3(D), nbytes_4(D));
return;
```

```
InitMemArray ()

FREQ:10000
<bb 2>:
mem_array_ents = 0;
return;
```

```
AddMemArray ()

FREQ:10000
<bb 2>:
mem_array_ents.7_1 = mem_array_ents;
if (mem_array_ents.7_1 > 19)
  goto <bb 5>; [2.00%]
else
  goto <bb 3>; [98.00%]

FREQ:200
<bb 5>:
goto <bb 4>; [100.00%]

FREQ:9800
<bb 3>:
mem_array[0][mem_array_ents.7_1] = true_addr_6(D);
mem_array[1][mem_array_ents.7_1] = adj_addr_8(D);
_2 = mem_array_ents.7_1 + 1;
mem_array_ents = _2;

FREQ:10000
<bb 4>:
# _3 = PHI <-1(5), 0(3)>
return _3;
```

```
RemoveMemArray ()

FREQ:1444
<bb 2>:
mem_array_ents.13_26 = mem_array_ents;
if (mem_array_ents.13_26 > 0)
  goto <bb 3>; [92.50%]
else
  goto <bb 14>; [7.50%]

FREQ:1332
<bb 3>:
_25 = mem_array[1][0];
if (adj_addr_15(D) == _25)
  goto <bb 15>; [7.50%]
else
  goto <bb 11>; [92.50%]

FREQ:1232
<bb 11>:

FREQ:8560
<bb 8>:
# i_30 = PHI <i_16(13), 0(11)>
i_16 = i_30 + 1;
if (i_16 < mem_array_ents.13_26)
  goto <bb 4>; [92.50%]
else
  goto <bb 19>; [7.50%]

FREQ:7918
<bb 4>:
_1 = mem_array[1][i_16];
if (_1 == adj_addr_15(D))
  goto <bb 16>; [7.50%]
else
  goto <bb 13>; [92.50%]

FREQ:100
<bb 15>:

FREQ:594
<bb 16>:
_28 = i_16 + 1;
goto <bb 5>; [100.00%]

FREQ:7324
<bb 13>:
goto <bb 8>; [100.00%]

FREQ:694
<bb 5>:
# i_29 = PHI <i_16(16), 0(15)>
# prephitmp_9 = PHI <_28(16), 1(15)>
_2 = mem_array[0][i_29];
*true_addr_17(D) = _2;
if (prephitmp_9 < mem_array_ents.13_26)
  goto <bb 10>; [85.00%]
else
  goto <bb 17>; [15.00%]

FREQ:590
<bb 10>:

FREQ:3931
<bb 6>:
# _27 = PHI <_5(12), prephitmp_9(10)>
# j_31 = PHI <_27(12), i_29(10)>
_3 = mem_array[0][_27];
mem_array[0][j_31] = _3;
_4 = mem_array[1][_27];
mem_array[1][j_31] = _4;
_5 = _27 + 1;
if (_5 < mem_array_ents.13_26)
  goto <bb 12>; [85.00%]
else
  goto <bb 18>; [15.00%]

FREQ:104
<bb 17>:

FREQ:590
<bb 18>:
goto <bb 7>; [100.00%]

FREQ:3341
<bb 12>:
goto <bb 6>; [100.00%]

FREQ:642
<bb 19>:

FREQ:108
<bb 14>:
goto <bb 9>; [100.00%]

FREQ:694
<bb 7>:
_7 = mem_array_ents.13_26 + -1;
mem_array_ents = _7;
goto <bb 9>; [100.00%]

FREQ:1444
<bb 9>:
# _11 = PHI <0(7), -1(19), -1(14)>
return _11;
```

```
CreateFile ()

FREQ:10000
<bb 2>:
fhandle_5 = fopen (filename_3(D), "w");
if (fhandle_5 == 0B)
  goto <bb 5>; [26.74%]
else
  goto <bb 3>; [73.26%]

FREQ:2674
<bb 5>:
goto <bb 4>; [100.00%]

FREQ:7326
<bb 3>:

FREQ:10000
<bb 4>:
# cstore_11 = PHI <10(5), 0(3)>
*errorcode_6(D) = cstore_11;
fclose (fhandle_5);
return;
```

```
bmOpenFile ()

FREQ:10000
<bb 2>:
fhandle_5 = fopen (fname_3(D), "w+");
if (fhandle_5 == 0B)
  goto <bb 5>; [26.74%]
else
  goto <bb 3>; [73.26%]

FREQ:2674
<bb 5>:
goto <bb 4>; [100.00%]

FREQ:7326
<bb 3>:

FREQ:10000
<bb 4>:
# cstore_10 = PHI <13(5), 0(3)>
*errorcode_6(D) = cstore_10;
return fhandle_5;
```

```
CloseFile ()

FREQ:10000
<bb 2>:
fclose (fhandle_2(D));
*errorcode_4(D) = 0;
return;
```

```
readfile ()

FREQ:10000
<bb 2>:
*errorcode_5(D) = 0;
offset.14_1 = (long int) offset_7(D);
_2 = fseek (fhandle_8(D), offset.14_1, 0);
if (_2 == -1)
  goto <bb 3>; [30.50%]
else
  goto <bb 4>; [69.50%]

FREQ:6950
<bb 4>:
nelems_11 = nbytes_10(D) & 65535;
_19 = __fread_alias (buffer_12(D), 1, nelems_11, fhandle_8(D));
if (nelems_11 != _19)
  goto <bb 5>; [69.50%]
else
  goto <bb 7>; [30.50%]

FREQ:3050
<bb 3>:
*errorcode_5(D) = 14;
goto <bb 6>; [100.00%]

FREQ:2120
<bb 7>:
goto <bb 6>; [100.00%]

FREQ:4830
<bb 5>:
*errorcode_5(D) = 11;

FREQ:10000
<bb 6>:
return;
```

```
writefile ()

FREQ:10000
<bb 2>:
*errorcode_5(D) = 0;
offset.15_1 = (long int) offset_7(D);
_2 = fseek (fhandle_8(D), offset.15_1, 0);
if (_2 == -1)
  goto <bb 3>; [47.12%]
else
  goto <bb 4>; [52.88%]

FREQ:5288
<bb 4>:
nelems_11 = nbytes_10(D) & 65535;
writecode_14 = fwrite (buffer_12(D), 1, nelems_11, fhandle_8(D));
if (nelems_11 == writecode_14)
  goto <bb 5>; [37.68%]
else
  goto <bb 7>; [62.32%]

FREQ:4712
<bb 3>:
*errorcode_5(D) = 14;
goto <bb 6>; [100.00%]

FREQ:3295
<bb 7>:
goto <bb 6>; [100.00%]

FREQ:1993
<bb 5>:
*errorcode_5(D) = 12;

FREQ:10000
<bb 6>:
return;
```

```
ReportError ()

FREQ:10000
<bb 2>:
__printf_chk (1, "ERROR CONDITION\nContext: %s\n", errorcontext_2(D));
__printf_chk (1, "Code: %d", errorcode_3(D));
return;
```

```
ErrorExit ()

FREQ:10000
<bb 2>:
exit (1);
```

```
StartStopwatch ()

FREQ:10000
<bb 2>:
_1 = clock ();
_4 = (long unsigned int) _1;
return _4;
```

```
StopStopwatch ()

FREQ:10000
<bb 2>:
_1 = clock ();
_2 = (long unsigned int) _1;
_6 = _2 - startticks_5(D);
return _6;
```

```
TicksToSecs ()

FREQ:10000
<bb 2>:
_2 = tickamount_1(D) / 1000000;
return _2;
```

```
TicksToFracSecs ()

FREQ:10000
<bb 2>:
_1 = (double) tickamount_2(D);
_3 = _1 / 1.0e+6;
return _3;
```