```
icc2_shell> man set_floorplan_density_rules
2.  Synopsys Commands                                   Command Reference
                          set_floorplan_density_rules

NAME
       set_floorplan_density_rules
              Defines a floorplan density rule.

SYNTAX
       set_floorplan_density_rules
              -from_object_types from_type_list
              -to_object_types to_type_list
              -to_lib_cells lib_cells
              -name rule_name
              [-from_layers layer_list]
              [-to_layers layer_list]
              -numerator count_method_type
              -cut_method cut_method_type
              -density_method density_method_type
              [-window_size {width length}]
              [-window_step {x_step y_step}]
              [-forbidden_list distance_list]
              [-forbidden_ranges {{low high} {low1 high1} ... }]
              [-max distance]
              [-min distance]
              [-offset distance]
              [-step distance]
              [-valid_list distance_list]
              [-valid_ranges {{low high} {low1 high1} ... }]
              [-offset_ranges {{low high} {low1 high1} ... }]

   Data Types
       from_type_list        list
       to_type_list          list
       lib_cells             collection
       rule_name             string
       layer_list            list
       distance_list         list
       count_method_type     string
       cut_method_type       string
       density_method_type   string
       width                 float
       length                float
       x_step                float
       y_step                float
       low                   float
       high                  float
       low1                  float
       high1                 float
       distance        float

ARGUMENTS
       -from_object_types from_type_list
              Specifies the list of "from" object types for the density floor-
              plan rule. These type of objects will enclose the  object  types
              specified  with -to_object_types or library cells specified with
              -to_lib_cells. Valid values for this option are  block_boundary,
              routing_blockage,  shape,  unplaceable_area  and  std_cell_area.
              This is a mandatory option.

       -to_object_types to_type_list
              Specifies the list of "to" object types for the  density  floor-
              plan  rule.  These  type  of  objects  will be enclosed by other
              objects specified with -from_object_types. Valid values for this
              option are cover_bump, hard_macro, io_pad, shape, soft_macro and
              tsv. This option is mutually exclusive  with  -to_lib_cells  and
              you must specify one or the other.

       -to_lib_cells lib_cells
```

Specifies the collection of **library** cells **for** the density floorplan rule. These **library** cells are being enclosed by other objects specified in -from_object_types. This option is mutually exclusive **with** -to_object_types **and** either one of them must be specified.

-name rule_name
Specifies the name of the density floorplan rule. This is a mandatory option.

-from_layers layer_list
Specifies the routing layers to be considered **for** "from" routing_blockage **or** shape object **type**. This option must be used along **with** -from_object_types routing_blockage **or** -from_object_types shape. This is an optional option.

-to_layers layer_list
Specifies the routing layers to be considered **for** "to" routing_blockage **or** shape object **type**. This option must be used along **with** -to_object_types routing_blockage **or** -to_object_types shape. This is an optional option.

-numerator count_method_type
Specifies counting calculation method **for** density calculation. It can either 'area' **or** 'count' of "to_object_types". This is a mandatory option.

-cut_method cut_method_type
Specifies cut method which is used to **specify** how to treat "to_object_types" when it is partial **/** overlap **or** **inside** "from_object_types". Value 'keep' indicates **if** "to_object_type" touches "from_object_type" then complete "to_object_type" should be taken into account, value 'drop' indicates that "to_object_type" should **not** be count **if** it is **not** completely **inside** "from_object_type" **and** window, value 'proportion' indicates that only count the portion of "to_object_type" overlap **with** "from_object_type". This is a mandatory option.

-density_method density_method_type
Specifies density method which is used to **specify** portion on which density should be calculated. This is a mandatory option.

-window_size {width length}
Specifies size of the window **for** which density will be calculated. This option must be used **with** -density_method local_window **and** -window_step.
This is an optional option.

-window_step {x_step y_step}
Specifies step by which window can be moved. This option must be used **with** -density_method local_window **and** -window_size. This is an optional option.

-forbidden_list distance_list
Specifies a list of distances by which the "from" object cannot enclose the "to" object. This option is mutually exclusive **with** -valid_list. Values in the distance_list cannot be negative. This is an optional option.

-forbidden_ranges {{low high} {low1 high1} ... }
Specifies a list of distance ranges between which the "from" object cannot enclose the "to" object. The enclosing distance must **not** lie **within** any of low **and** high in the specified list of ranges. This option is mutually exclusive **with** -valid_ranges. Values cannot be negative. This is an optional option.

-max distance
Specifies the maximum distance by which the "from" object can enclose the "to" object. The distance cannot be greater than

this value. The distance cannot be negative. If -min is also specified, this value must be greater than the min value. This is an optional option.

-min distance
Specifies the minimum distance by which the "from" object can enclose the "to" object. The distance cannot be less than this value. The value specified cannot be negative. If -max is also specified then this value must be less than the max value. This is an optional option.

-offset distance
Specifies a parameter in distance calculation between the "from" and "to" objects. This option must be used together with -step. This implies that the distance has to be an integer multiple of the -step value plus the -offset value. The value specified cannot be negative. This option is mutually exclusive with -offset_ranges. This is an optional option.

-step distance
Specifies a parameter in distance calculation between the "from" and "to" objects. This option must be used together with -offset or -offset_ranges. This implies that the distance has to be an integer multiple of the -step value plus the -offset value or distance has to be in range of an integer multiple of the -step value plus the -offset_ranges value. The value specified cannot be negative. This is an optional option.

-valid_list distance_list
Specifies a list of distances by which the "from" object can enclose the "to" object. This option is mutually exclusive with -forbidden_list. Values specified cannot be negative. This is an optional option.

-valid_ranges {{low high} {low1 high1} ... }
Specifies a list of distance ranges between which the "from" object can enclose the "to" object. The distance must lie within any of low and high in the specified list of ranges. This option is mutually exclusive with -forbidden_ranges. Values specified cannot be negative. This is an optional option.

-offset_ranges {{low high} {low1 high1} ... }
Specifies a list of distance ranges. This implies that the distance has to be in range of an integral multiple of step value plus offset_ranges value. Values specified can't be negative. This option must be used along with -step. This is an optional option.

DESCRIPTION
The set_floorplan_density_rules command defines a named density floorplan rule in the current design. The defined rule is persistent. If another floorplan rule by the same name exists then the command errors out.

If the measured value falls inside valid range or is a member of the valid list then there is no violation given by check_floorplan_rules regardless of other constraints like min, max, etc. If this measured value is outside valid range or list then a violation is reported if other constraints are specified and they are not met or if no other constraints are specified.

All the values specified as float are supported upto 4 decimal points.

EXAMPLES
The following example creates an density rule named ds1. This rule checks the density based on amount of io_pad. If shape is completely inside io_pad then it will not be counted. It checkes density in a window of width 1 and length 2 which can be step to 3 units on x-axis and 4 units on y-axis.

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208
209           prompt> set_floorplan_density_rules -name ds1 \
210              -from_object_types shape \
211              -to_object_types io_pad -numerator amount -cut_method drop \
212               -density_method local_window -window_size {1 2} -window_step {3 4} \
213              -offset 10 -step 2
214
215   SEE ALSO
216          remove_floorplan_rules(2)
217          report_floorplan_rules(2)
218          set_floorplan_area_rules(2)
219          set_floorplan_extension_rules(2)
220          set_floorplan_exception_rules(2)
221          set_floorplan_forbidden_rules(2)
222          set_floorplan_halo_rules(2)
223          set_floorplan_length_rules(2)
224          set_floorplan_spacing_rules(2)
225          set_floorplan_width_rules(2)
226
227                              Version S-2021.06-SP5
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229   icc2_shell>
230
```