

Adding a new activity :

In order to demonstrate these changes, we show how to add an activity called "NewType". The changes required in the config file is a single line as shown below:

Step – 1 : Changes in the config file

In the config file `data/simulation.xml`, we add an activity type as shown in green below

```
<activity_types>
  <activity_type name="Work" withinday_mode_choice="wdmw" num_tours="ntw" tour_mode_dest="tmdw"
    tour_mode="tmw" tour_time_of_day="ttdw" type="1" logsum_table_column="work"/>
  <activity_type name="Education" withinday_mode_choice="wdme" num_tours="nte" tour_mode_dest=""
    tour_mode="tme" tour_time_of_day="ttde" type="2" logsum_table_column="education"/>
  <activity_type name="Shop" withinday_mode_choice="wdmso" num_tours="nts" tour_mode_dest="tmds"
    tour_mode="" tour_time_of_day="ttdo" type="3" logsum_table_column="shop"/>
  <activity_type name="Other" withinday_mode_choice="wdmso" num_tours="nto" tour_mode_dest="tmdo"
    tour_mode="" tour_time_of_day="ttdo" type="3" logsum_table_column="other"/>
  <activity_type name="NewType" withinday_mode_choice="wdmso" num_tours="nto" tour_mode_dest="tmdo"
    tour_mode="" tour_time_of_day="ttdo" type="3" logsum_table_column="newtype"/>
</activity_types>
```

While the activity names are made configurable, the main types of activities are NOT. The types of activities as specified in the config file `simrun_Midterm.xml` must be the same as the of activities as hardcoded in the `dev/Basic/shared/StopType.hpp`, as shown below :

```
StopType NULL_STOP = -1;
StopType WORK_ACTIVITY_TYPE = 1;
StopType EDUCATION_ACTIVITY_TYPE = 2;
StopType OTHER_ACTIVITY_TYPE = 3;
StopType WORK_BASED_SUBTOUR = 5 ;
```

Step - 2: Changes in lua files:

dps.lua:

i) The activity type map should be updated: The new key for "NewType" is added as shown in green below:

```
local activity_types = { ["Work"] = 1, ["Education"] = 2, ["Shop"] = 3,
  ["Others"] = 4, ["NewType"] = 5 }
```

ii) Inside function `compute_utilities()`, add a new variable for the logsum of the new activity, shown in green.

```
local otherlogsum = params:activity_logsum(activity_types.Others)

local otherlogsum = params:activity_logsum(activity_types.Others)
```

```
local newTypeLogsum = params:activity_logsum(activity_types.NewType)
```

iii) The choice set should be altered. For example the choice set can be expanded to include 5 activity types as shown in green below:

```
--choiceset
local choice = {
    {0,0,0,0,0},
    {1,0,0,0,0},
    {0,1,0,0,0},
    {0,0,1,0,0},
    {0,0,0,1,0},
    {0,0,0,0,1},
    {1,0,1,0,0},
    {1,0,0,1,0},
    {0,1,1,0,0},
    {0,1,0,1,0}
}
```

=====dpt.lua:

Changes same as dps.lua

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dpb.lua:

i) The activity type map should be updated: The new key for "NewType" is added as shown in green below:

```
local activity_types = { ["Work"] = 1, ["Education"] = 2, ["Shop"] = 3,
    ["Others"] = 4, ["NewType"] = 5 }
```

ii) Inside function compute_utilities(), add a new variable for the logsum of the new activity, shown in green.

```
local otherlogsum = params:activity_logsum(activity_types.Others)

local otherlogsum = params:activity_logsum(activity_types.Others)

local newTypeLogsum = params:activity_logsum(activity_types.NewType)
```

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isg.lua

i) Updating the choice vector. The additions are shown in green

```
--choice set
--1 for work; 2 for edu; 3 for shopping; 4 for
other; 5 for quit, 5 for NewType, 6 for quit
local choice = {
    1,
    2,
    3,
    4,
    5,
    6
}
```

ii) Inside `compute_utilities function()`: The lines in red to be deleted and the lines in green should be added as shown below:

```
utility[4] = beta_cons_other + beta_work_tour_dummy_O * 1 .....
utility[5] = beta_cons_other+beta_work_tour_dummy_O * 1.....
```

Earlier, The utility[5] represented "quit". But after adding a new mode, utility[6] represents for "quit".

```
utility[4] = beta_cons_other + beta_work_tour_dummy_O * 1 .....
utility[5] = beta_cons_other+beta_work_tour_dummy_O * 1.....
utility[6] = beta_cons_other+beta_work_tour_dummy_O * 1.....
```

3) Inside the `compute_availabilities()` function, the range of the for loop should be changed :

```
for i = 1, 5 do
for i = 1, 6 do
```

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Step- 3: Changes in the logsum table

The logsum table should have (N+4) columns, where N is the number of Activity types allowed. For example when we have a total of 5 allowed activities:

Work,Education,Shopping,Other,and NewType , the create table query of the logsum table should look as shown below:

```
CREATE TABLE demand.preday_logsum_test_new_activity_aditi
(
  person_id bigint NOT NULL,
  work double precision,
  education double precision,
  shop double precision,
  other double precision,
  newtype double precision,
  dp_tour double precision,
  dp_stop double precision,
  CONSTRAINT preday_logsum_test_new_activity_aditi_pkey PRIMARY KEY (person_id)
)
```

Important Consideration: The order of the Activity names must be in accordance with the order specified in the simrun_MidTerm.xml config file