- The activity of a variable x is initialized to be zero.

In order to use activity for branching, one must create an object of class `IntActivity` for integer or Boolean variables, an object of class `SetActivity` for set variables, or an object of class `FloatActivity` for float variables. The object is responsible for recording activity information.

If x is an integer variable array, then

```
IntActivity act(home,x,0.99);
```

initializes the activity information `act` for the variables in x with decay-factor `d` = `0.99`. The decay-factor is optional and defaults to no decay (`d` = 1).

The activity of each variable in an array x can be initialized by a merit function, see Section 8.7. If `bm` is a merit function, then

```
IntActivity act(home,x,0.99,&bm);
```

initializes the activity of `x[i]` to the value returned by `bm(home,x[i],i)`.

The decay-factor can be changed later, say to `d` = `0.95`, by

```
act.decay(0.95);
```

and `act.decay()` returns the current decay-factor of `act`.

A branching for integer variables using activity information must be given an object of type `IntActivity` as argument:

```
branch(home, x, INT_VAR_ACTIVITY_MAX(act), INT_VAL_MIN());
```

Here the integer variable array x must be exactly the same that has been used for creating the integer activity object `act`.

The activity object can be omitted if one does not want to change the decay-factor later, hence it is sufficient to pass the decay-factor as argument. For example:

```
branch(home, x, INT_VAR_ACTIVITY_MAX(0.99), INT_VAL_MIN());
```

uses activity information with a decay-factor of `0.99`. Even the decay-factor can be omitted and defaults to `1` (that is, no decay).

Activity for other variable types is analogous.

8.6 Random variable and value selection

One particular strategy for variable and value selection is by random. For integer and Boolean variables, `INT_VAR_RND(r)` selects a random variable and `INT_VAL_RND(r)` selects a random value where `r` is a random number generator of class `Rnd`. For set variables, `SET_VAR_RND(r)` selects a random variable and `SET_VAL_RND_INC(r)` and `SET_VAL_RND_EXC(r)` include and exclude a random value from a set variable. For float