LAB #12
Server Automation Managing Schedules.

After creation of job and it's steps, we must create a schedule that will be used by some jobs, i.e. these jobs will be executed according to this schedule. To create the schedule is used the **sp_add_schedule** stored procedure. It's syntax:

sp_add_schedule [@chedule_name =] '*schedule_name*'
[, [@enabled =] *activity*]
[, [@freq_type =] *frequency_type*]
[, [@freq_interval =] *frequency_interval*]
[, [@freq_relative_interval =] *week_number*]
[, [@freq_recurrence_factor =] *month_week_number*]
[, [@active_start_date =] *job_start_date*]
[, [@active_end_date =] *job_end_date*]
[, [@active_start_time =] *job_start_time*]
[, [@active_end_time =] *job_end_time*]
[, [@owner_login_name =] '*owner_login_name*']

Consider the arguments.

– **@enabled**. Defines activity of the schedule. The default value is 1, that corresponds to an active schedule; If this value is 0, then the schedule is not active and no task will be executed by this schedule.

– **@freq_type**. A value indicating when a job is to be executed. The default value is 0. Its possible values are shown in the Table 8.1.

– **@freq_interval**. Defines the days of job's executing (Table 8.2). It's value is depended on value of the *@frequency_type* argument. The default value is 1.

– **@freq_relative_interval**. Is specified only when value of the **@freq_type** argument is 32. The value of this arguments defines the week number:

1 – the first week of month;

2 - the second week of month;

4 - the third week of month;

8 - the fourth week of month;

16 – the last week of month.

- **@freq_recurrence_factor**. The number of weeks or months between the scheduled execution of a job. Is used when the value of the *frequency_type* argument equals to 8, 16 or 32.

– **@active_start_date**. The date on which execution of a job can begin. *@active_start_date* is int, with a default of NULL, which indicates today's date. The date is formatted as YYYYMMDD. If *@active_start_date* is not NULL, the date must be greater than or equal to 19900101.

– **@active_end_date**. The date on which execution of a job can stop. **@active_end_time** is int, with a default of 99991231, which indicates December 31, 9999. Formatted as YYYYMMDD.

– **@active_start_time**. The time on any day between *@active_start_date* and *@active_end_date* to begin execution of a job. *@active_start_time* is int, with a default of 000000,

which indicates 12:00:00 A.M. on a 24-hour clock, and must be entered using the form HHMMSS.

– **@active_end_time.** The time on any day between **@active_start_date** and **@active_end_date** to end execution of a job. **@active_end_time** is int, with a default of 235959, which indicates 11:59:59 P.M. on a 24-hour clock, and must be entered using the form HHMMSS.

– **@owner_login_name.** The login name of the schedule owner. The default value is NULL. This means that it's creator is the owner of the schedule.

Table 8.1. The values of the *frequency_type* argument.

Frequency Type	Description
1	Once
4	Daily
8	Weekly
16	Monthly
32	Monthly, relative to *freq_interval*
64	Run when SQL Server Agent service starts
128	Run when the computer is idle

Table 8.2 The values of the *frequency_interval* argument.

Frequency Type	Frequency interval
1	*frequency_interval* is unused
4	Every *frequency_interval* days
8	*frequency_interval* is one or more of the following combined with an OR logical operator: 1 = Sunday 2 = Monday 4 = Tuesday 8 = Wednesday 16 = Thursday 32 = Friday 64 = Saturday
16	On the *frequency_interval* day of the month.
32	*frequency_interval* is one of the following: 1 = Sunday 2 = Monday 3 = Tuesday 4 = Wednesday 5 = Thursday 6 = Friday 7 = Saturday

	8 = day
	9 = weekday
	10 = weekend day
64	*frequency_interval* is unused
128	*frequency_interval* is unused

Examples.

Create the Schedule_1 schedule. Occurs once on 30.05.2020 at 01:37:06.
```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_1',
    @freq_type = 1,
    @active_start_date = 20200530,    -- 30.05.2020
    @active_start_time = 013706;      -- 01:37:06
```

Create the Schedule_4 schedule. Occurs every 3 days at 01:37:06. Schedule will be used between 25.04.2020 and 16.05.2020:
```
USE msdb;
EXEC sp_add_schedule  @schedule_name = N'Schedule_4',
    @freq_type = 4,                    -- day
    @freq_interval = 3,
    @active_start_time = 013706,       -- 01:37:06
    @active_start_date = 20200425,     -- 25.04.2020
    @active_end_date = 20200516;       -- 16.05.2020
```

Create the Schedule_41 schedule. Occurs every 2 days at 00:00:00. Schedule will be used from today:
```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_41',
    @freq_type = 4,                    -- day
    @freq_interval = 2;
```

Create the Schedule_42 schedule. Occurs every day at 04:05:10. Schedule will be used from today:
```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_42',
    @freq_type = 4,                    -- day
    @freq_interval = 1,
    @active_start_time = 040510,       -- 04:05:10
```

Create the Schedule_8 schedule. Occurs every 3 week(s) on Monday at 00:00:00. Schedule will be used from today:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_8',
    @freq_type = 8,                    -- week
    @freq_interval = 2,                -- Monday
    @freq_recurrence_factor = 3;       -- every 3 week(s)
```

Create the Schedule_81 schedule. Occurs every 4 week(s) on Tuesday at 00:00:00. Schedule will be used between 14.05.2020 and 15.10.2020:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_81',
    @freq_type = 8,                    -- week
    @freq_interval = 4,                -- Tuesday
    @freq_recurrence_factor = 4,       -- every 4 week(s)
    @active_start_date = 20200514,     -- 14.05.2020
    @active_end_date = 20201015;       -- 15.10.2020
```

Create the Schedule_82 schedule. Occurs every 5 week(s) on Saturday at 01:37:06. Schedule will be used between 24.02.2020 and 25.06.2020:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_82',
    @freq_type = 8,                    -- week
    @freq_interval = 64,               -- Saturday
    @freq_recurrence_factor = 5,       -- every 5 week(s)
    @active_start_time = 013706,       -- 01:37:06
    @active_start_date = 20200224,     -- 24.02.2020
    @active_end_date = 20200625;       -- 25.06.2020
```

Create the Schedule_16 schedule. Occurs every 4 month(s) on day 3 of that month at 00:00:00. Schedule will be used from today:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_16',
    @freq_type = 16,                   -- month
    @freq_recurrence_factor = 4,       -- every 4 month(s)
    @freq_interval = 3;                -- day 3
```

Create the Schedule_161 schedule. Occurs every 7 month(s) on day 21 of that month at 00:00:00. Schedule will be used from today:

```
USE msdb;
EXEC sp_add_schedule
        @schedule_name = N'Schedule_161',
        @freq_type = 16,                      -- month
        @freq_recurrence_factor = 7,          -- every 7 month(s)
        @freq_interval = 21;                  -- day 21
```

Create the Schedule_162 schedule. Occurs every 5 month(s) on day 15 of that month at 01:37:06. Schedule will be used between 14.05.2020 and 15.06.2021:

```
USE msdb;
EXEC sp_add_schedule
        @schedule_name = N'Schedule_162,
        @freq_type = 16,                      -- month
        @freq_recurrence_factor = 5,          -- every 5 month(s)
        @freq_interval = 15,                  -- day 15
        @active_start_time = 013706,          -- 01:37:06
        @active_start_date = 20200514,        -- 14.05.2020
        @active_end_date = 20210615;          -- 15.06.2021
```

Create the Schedule_32 schedule. Occurs every third Wednesday of every 1 month(s) at 01:00:00. Schedule will be used from today:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_32',
    @freq_type = 32,                      -- Monthly relative to freq_interval
    @freq_recurrence_factor = 1,          -- every 1 month(s)
    @freq_relative_interval = 4,          -- third
    @freq_interval = 4,                   -- Wednesday
    @active_start_time = 010000;          -- 01:00:00
```

Create the Schedule_321 schedule. Occurs every fourth Thursday of every 2 month(s) at 01:37:06. Schedule will be used starting on 24.05.2020:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_321',
    @freq_type = 32,                      -- Monthly relative to freq_interval
    @freq_recurrence_factor = 2,          -- every 2 month(s)
    @freq_relative_interval = 8,          -- fourth
    @freq_interval = 5,                   -- Thursday
    @active_start_time = 013706,          -- 01:37:06
```

```
    @active_start_date = 20200524;              -- 24.05.2020
```

        Create the Schedule_322 schedule. Occurs every last Friday of every 5 month(s) at 01:37:06.
The end time is 12:58:59. Schedule will be used between 24.05.2020 and 25.06.2021:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_322',
    @freq_type = 32,                            -- Monthly relative to freq_interval
    @freq_recurrence_factor = 5,                -- every 5 month(s)
    @freq_relative_interval = 16,               -- last
    @freq_interval = 6,                         -- Friday
    @active_start_time = 013706,                -- 01:37:06
    @active_start_date = 20200524,              -- 24.05.2020
    @active_end_date = 20210625,                -- 25.06.2021
    @active_end_time = 125859;                  -- 12:58:59
```

        Create the Schedule_323 schedule. Occurs every last Friday of every 6 month(s) at 00:00:00.
Schedule will be used from today:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_323',
    @freq_type = 32,                            -- Monthly relative to freq_interval
    @freq_recurrence_factor = 6,                -- every 6 month(s)
    @freq_relative_interval = 16,               -- last
    @freq_interval = 6;                         -- Friday
```

        Create the Schedule_324 schedule. Occurs every first Monday of every 3 month(s) at
00:00:00. Schedule will be used from today up to 15.06.2020:

```
USE msdb;
EXEC sp_add_schedule
    @schedule_name = N'Schedule_324',
    @freq_type = 32,                            -- Monthly relative to freq_interval
    @freq_recurrence_factor = 3,                -- every 3 month(s)
    @freq_relative_interval = 1,                -- First
    @freq_interval = 2,                         -- Monday
    @active_end_date = 20200615;                -- 15.06.2020
```

        Create the Schedule_64 schedule. Run when SQL Server Agent service starts. Schedule will
be used from today:

```
USE msdb;
EXEC dbo.sp_add_schedule
    @schedule_name = N'Schedule_64',
```

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```
@freq_type = 64;
```

Create the Schedule_128 schedule. Run when the computer is idle. Schedule will be used starting on 27.06.2020:

```
USE msdb;
EXEC dbo.sp_add_schedule
    @schedule_name = N'Schedule_128',
    @freq_type = 128,
    @active_start_date = 20200627; -- 27.06.2020
```

Change the Schedule_324 schedule. Occurs every second Sunday of every 4 month(s) at 11:02:30. Schedule will be used from today up to 17.08.2020:

```
USE msdb;
EXEC sp_update_schedule
    @name = N'Schedule_324',
    @freq_type = 32,                        -- Monthly relative to freq_interval
    @freq_recurrence_factor = 4,            -- every 4 month(s)
    @freq_relative_interval = 2,            -- Second
    @freq_interval = 1,                     -- Sunday
    @active_end_date = 20200817;            -- 17.08.2020
```

Delete the Schedule_128 schedule:

```
EXEC sp_delete_schedule @schedule_name = N'Schedule_128';
```

Set a schedule for a job

To set a schedule for a job is used sp_attach_schedule system procedure. It's syntax:

sp_attach_schedule [@job_name =] *'job_name'* **},**
                 [@schedule_name =] *'schedule_name'* **}**

Consider the arguments.
- *'job_name'*. The name of the job to which the schedule is added.
- *'schedule_name'*. The name of the schedule to set for the job.

Set the Schedule_324 schedule for the Job_51 job:

```
USE msdb;
EXEC sp_attach_schedule @job_name = N'Job_51',
                        @schedule_name = N'Schedule_324';
```

Exercises.

1. Create the Schedule_3 schedule. The job, that uses this schedule must be executed once at 22:55

2. Create the Schedule_3 schedule. The job, that uses this schedule must be executed at Tuesday of the fourth week of each month.

3. Change the Schedule_3 schedule so, that the job will be executed monthly on Monday of the third week.

4. Delete the Schedule_2 schedule.

5. Set the Schedule_2 schedule for the Job_2 job.