How to calculate weights for the different signal and background samples

$$N^{expct} = L \times \sigma \times \epsilon_{tot}$$

where the total efficiency is equal to

$$\epsilon_{tot} = \epsilon_{\mathrm{filt}} \times \epsilon_{\mathrm{sel}} = \epsilon_{\mathrm{filt}} \times \frac{N_{obs}}{N_{gen}}$$

so we get the following number of expected events:

$$N^{\mathrm{expct}} = L \times \sigma \times \frac{N_{\mathrm{obs}}}{N_{\mathrm{gen}}} \times \epsilon_{\mathrm{filt}}$$

Therefore, we define the weight

$$w = \frac{L \times \sigma \times \epsilon_{\mathrm{filt}}}{N_{\mathrm{gen}}}$$

So that the expected number of events is simply

$$N^{\mathrm{expct}} = N_{\mathrm{obs}} \times w$$

If we want equivalent luminosity of 30 pb-1 and express the cross section in pico-barns, we get the following table:

Sample	Weight	Sample	Weight
LM0	0.00563	**LM11**	0.00009
LM1	0.00071	**LM12**	0.00063
LM2	0.00010	**LM13**	0.00093
LM2mhfeq360	0.00006	**QCD 100 to 250**	19.3101
LM3	0.00045	**QCD 250 to 500**	1.0442
LM4	0.00022	**QCD 500 to 1000**	0.0368
LM5	0.00006	**QCD 1000 to Inf**	0.0015
LM6	0.00003	**ZJets**	0.0664
LM7	0.00013	**WJets**	0.0720
LM8	0.00010	**TTbarJets**	0.0019
LM9	0.00097	**Ztautau**	0.0178
LM9p	0.00023	**Wtaunu**	0.1084
LM9t175	0.00058	**ppMuX**	245.4798
LM10	0.00001		

If we want equivalent luminosity of 40 pb-1 and express the cross section in pico-barns, we get the following table:

Sample	Weight	Sample	Weight
LM0	0.00750	**LM11**	0.00012
LM1	0.00094	**LM12**	0.00085
LM2	0.00013	**LM13**	0.00124
LM2mhfeq360	0.00008	**QCD 100 to 250**	25.7468
LM3	0.00060	**QCD 250 to 500**	1.3922
LM4	0.00029	**QCD 500 to 1000**	0.0491
LM5	0.00008	**QCD 1000 to Inf**	0.0020
LM6	0.00004	**ZJets**	0.0885
LM7	0.00018	**WJets**	0.0960
LM8	0.00013	**TTbarJets**	0.0026
LM9	0.00130	**Ztautau**	0.0237
LM9p	0.00031	**Wtaunu**	0.1446
LM9t175	0.00077	**ppMuX**	327.3064
LM10	0.00001		