# **ROOT Exercise 1**

The aim of this exercise is to use ROOT to analyse purchase operations from an imaginary pumpkin market. Each data entry corresponds to a transaction between the shop and a farmer who sells his pumpkins (each farmer performs only one transaction). Some farmers have bigger farms, others have smaller farms – each one brings a different number of pumpkins (n). There are five different types of pumpkins: orange, green, yellow, red and white distinguished by the variable color equal 0, 1, 2, 3 and 4, respectively. Finally, every pumpkin has a weight stored in a variable called mass [kg].

### **Preparation and interactive work**

- 1. Download data from a small, local pumpkin market: wget ppss.ifj.edu.pl/materials\_2019/pumpkins\_small.root
- 2. Open the downloaded file and browse its content.
- 3. How many farmers sold their pumpkins?
- 4. How many pumpkins were sold by 10th farmer? Which colors? What masses?
- 5. How many farmers sold exactly two pumpkins? (use Scan method)

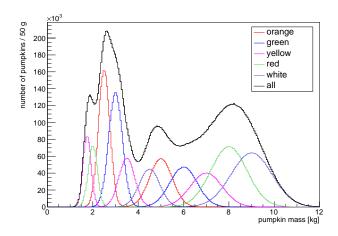
# Histograms via TTree::Draw

- 7. Download data from a huge, country-wide pumpkin market: wget ppss.ifj.edu.pl/test/pumpkins\_big.root
- 8. Find and read documentation for TTree::Draw(char\*, char\*, char\*, int, int).
- 9. What is the distribution of pumpkin colors (among all pumpkins)?
- 10. How many pumpkins have been purchased?
- 11. What is the distribution of pumpkin masses (among all pumpkins)?
- 12. What is the distribution of yellow pumpkin masses?
- 13. What is the distribution of the number of pumpkins from each farmer (among all farmers)? How does it look like in the logarithmic scale in the vertical axis?
- 14. Is there a correlation between the color and weight of pumpkins?

## **Nice plots**

#### Create a macro that:

- 15. loads the data file (TFile).
- 16. produces mass distributions for all pumpkins and for each color
  (TTree::Draw("...>>h(...)", ...)),
- 17. sets the axis titles, line colors, etc.,
- 18. draws everything together in a plot like:



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