Exercise 1:

An individual can exist in several states: **alive, deceased, minor, adult, single, married, widowed,** and **divorced**. To get married, a person must be of legal age. Draw a **state-transition diagram** showing these states, and identify the **events** that cause an individual to move from one state to another.

Exercise 2:

The behavior of a car wash machine is as follows:

- The wash cycle begins when the **start button** is pressed.
- It first goes through a **2-minute polishing phase**, followed by a **6-minute washing phase**, and finally a **2-minute drying phase**.
- During the polishing or washing phases, the customer can press the **emergency stop button**. If pressed, the machine **pauses**, and the customer has **2 minutes** to resume by pressing the start button again. The machine will then **continue the interrupted phase**. If the customer does not resume within 2 minutes, the machine **stops**.
- During the drying phase, the customer can also interrupt the machine. In this case, however, the machine **stops permanently** for that wash cycle.

Draw a **state-transition diagram** for the machine that represents a complete washing cycle.

Exercise 3: Digital Pets

You are tasked with creating a program to manage digital pets. The pet's behavior depends on its **current state** and the **stimuli** it receives. To model this, you decide to use a **state diagram**.

The behavior of the digital pet is as follows:

- When powered on (**On**), the pet starts in a **happy** state.
- If the pet is happy and receives a **punishment**, it becomes **sad**.
- If the pet is sad and receives **praise**, it becomes **happy**.
- If the pet is sad and receives another **punishment**, it becomes **heartbroken**.

Identify the **states** and **transitions** of the digital pet, and draw a **state-transition diagram** to represent its behavior.