SOFTWARE DESIGN & ANALYSIS

ASSIGNMENT 3

Q1:

Q2:

```
                            ●
                            │
                            ▼
                 ┌──────────────────────┐
        ┌───────▶│   Machine turned off │◀───────┐
        │        └──────────────────────┘        │
        │                    │                    │
        │                    │ Press On Button    │ Press On Button
        │                    ▼                    │
        │            ┌──────────────┐             │
        │            │   Power On   │─────────────┘
        │            └──────────────┘
        │                    │
        │                    │ Washing Option
        │                    ▼
  Press On Button    ┌──────────────┐
        ├────────────│   Washing    │
        │            └──────────────┘
        │                    │
        │                    │ Washed
        │                    ▼
        │            ┌──────────────┐
  Press On Button    │   Rinsing    │
        ├────────────└──────────────┘
        │                    │
        │                    │ Rinsing Done
        │                    ▼
        │            ┌──────────────┐
        │            │   Spinning   │
        ├────────────└──────────────┘
        │  Press On Button   │
        │                    │ Dried
        │                    ▼
        │            ┌──────────────────┐
        │            │ Take Out Clothes │
        └────────────└──────────────────┘
           Press On Button    │
                              ▼
                             ◉
```
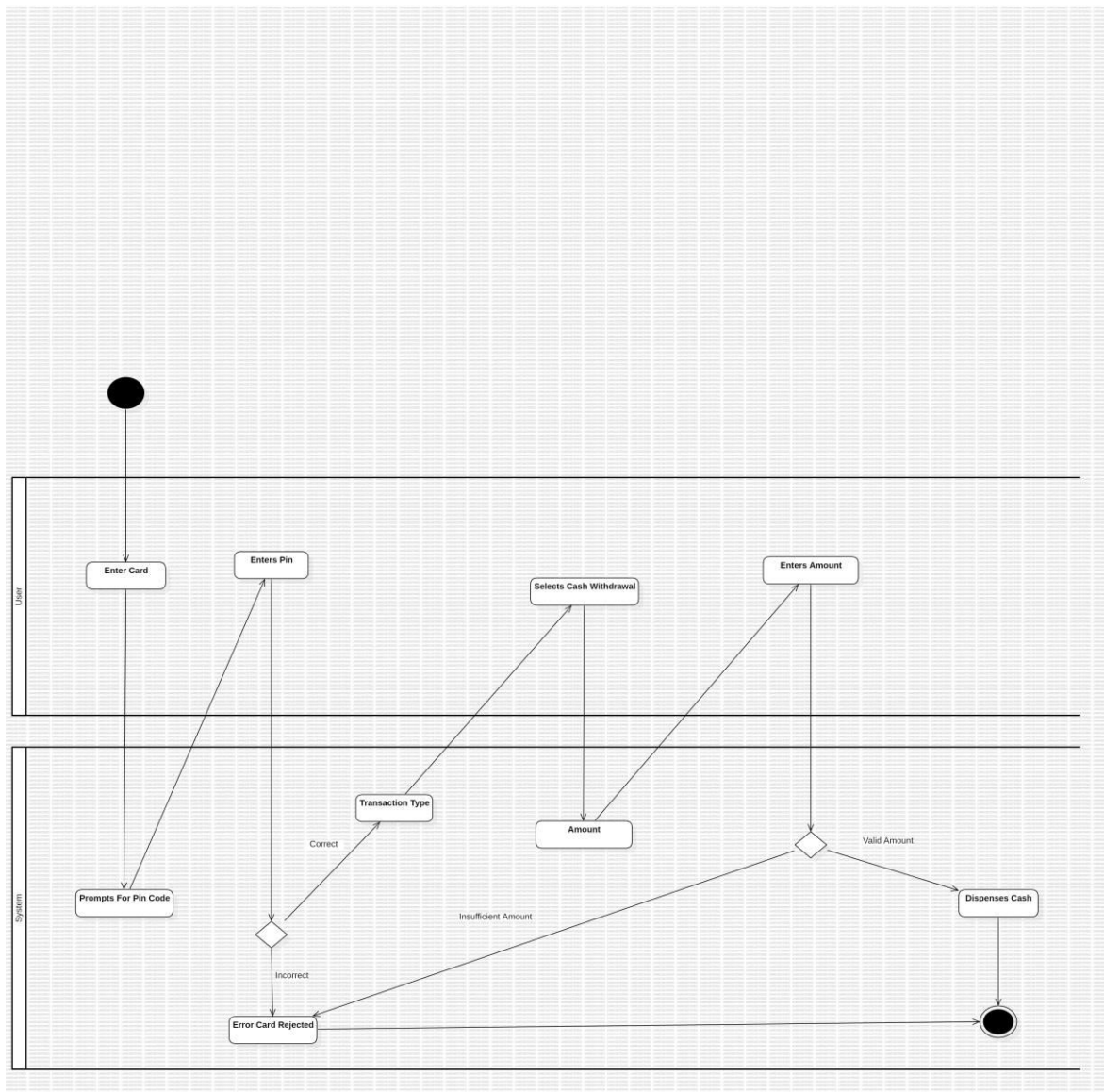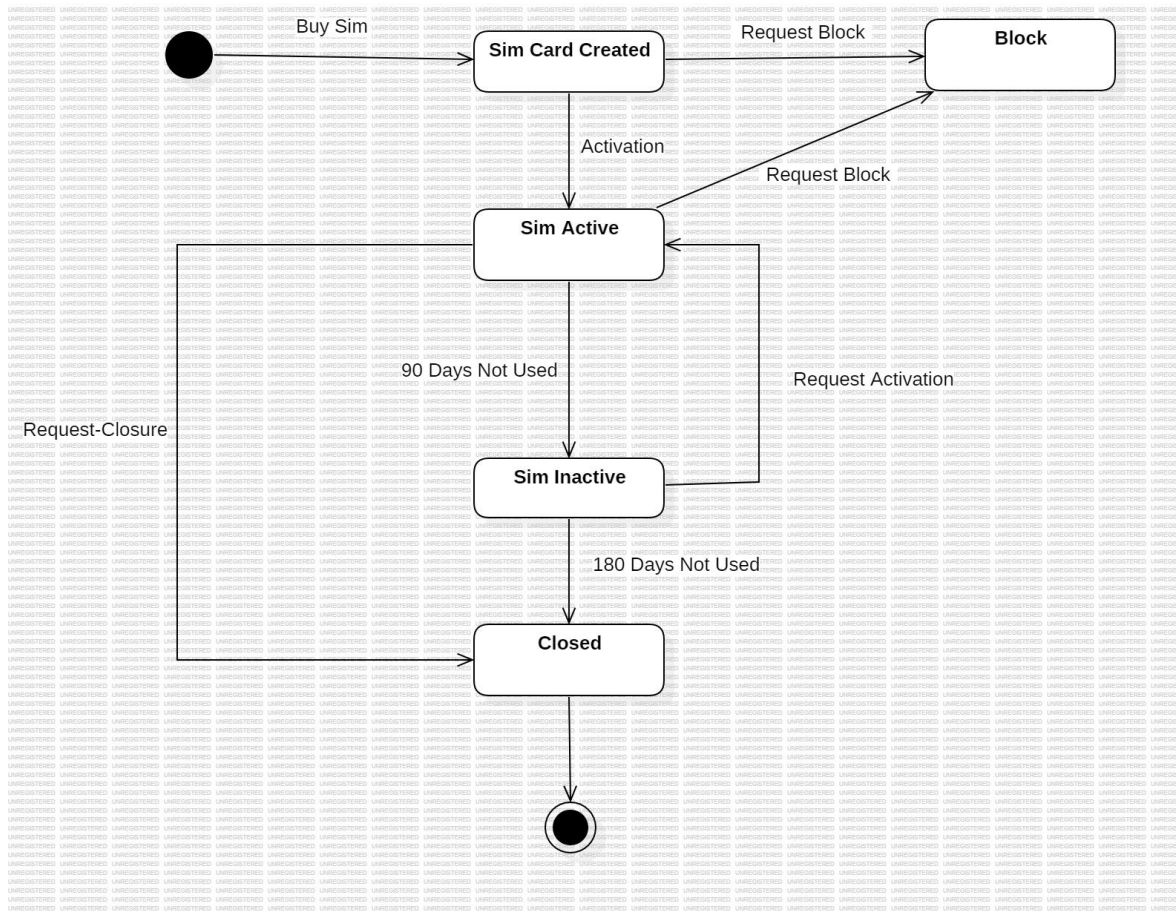
Q3:

Q4:

Q5:
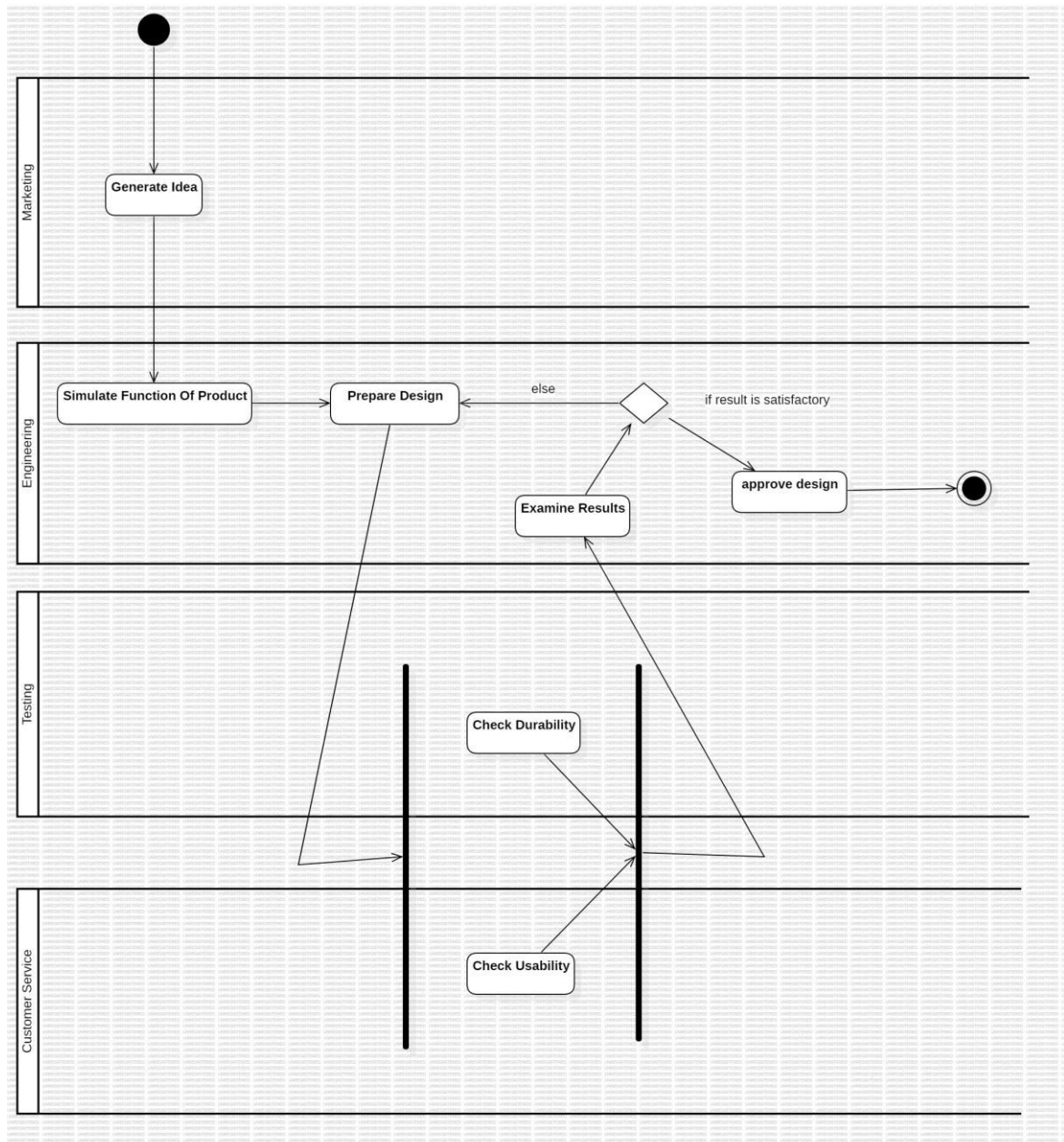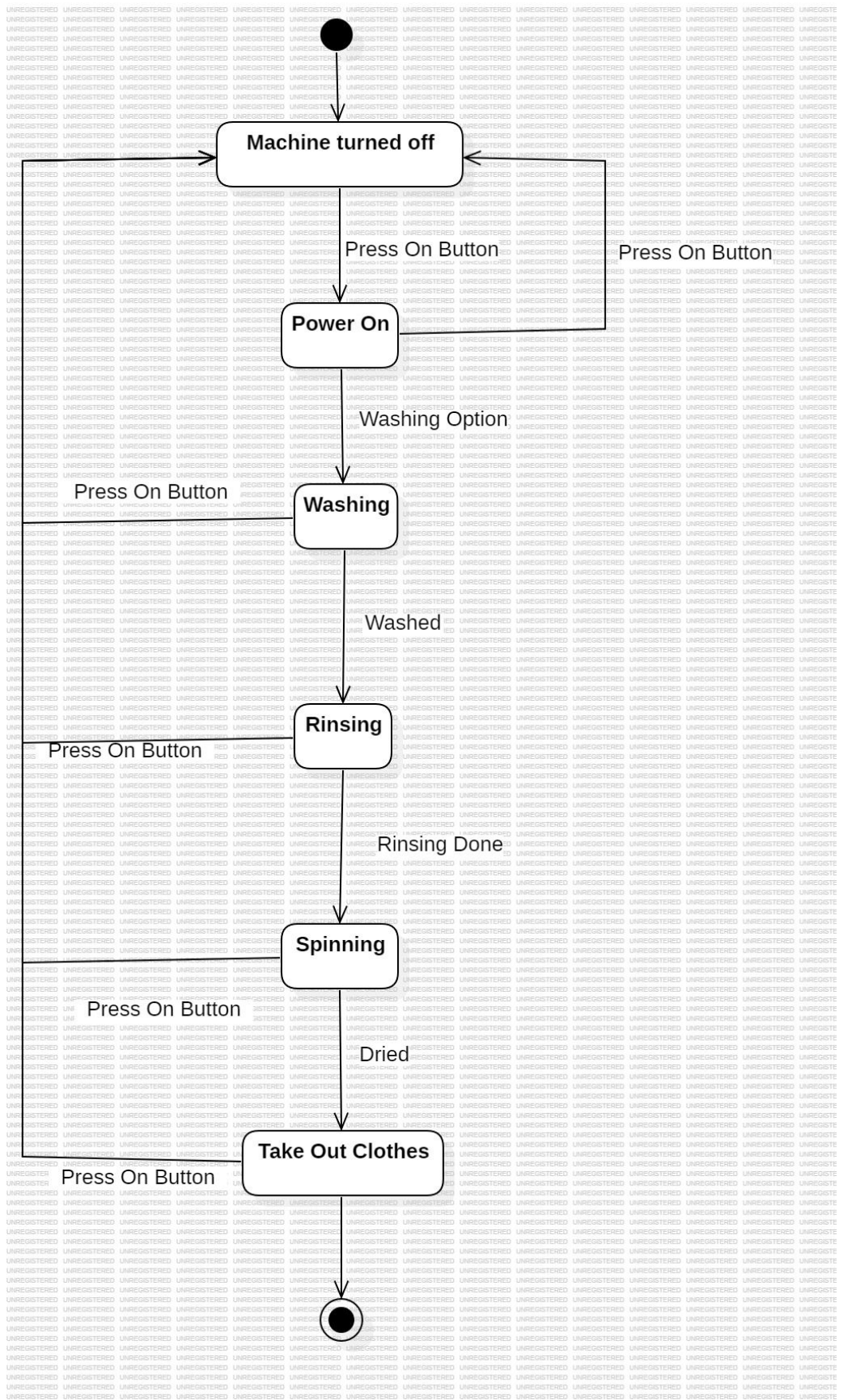
```cpp
#include <iostream>

using namespace std;


class person {
protected:
  string person_name;


public:
  person(string pname) : person_name(pname) {}
  void displayInfo() { cout << "Name: " << person_name << endl; }
};


class student : virtual public person {
```

```cpp
protected:
  string edu_degree;

public:
  student(string pname, string degreeVal) : person(pname), edu_degree(degreeVal) {}
  void displayInfo() override {
    person::displayInfo();
    cout << "Degree: " << edu_degree << endl;
  }
};


class teacher : virtual public person {
protected:
  string job_title;

public:
  teacher(string pname, string title) : person(pname), job_title(title) {}
  void displayInfo() override {
    person::displayInfo();
    cout << "Designation: " << job_title << endl;
  }
};


class TA : public student, public teacher {
private:
  int monthly_salary;

public:
  TA(string pname, string degreeVal, string title, int salVal)
      : person(pname), student(pname, degreeVal), teacher(pname, title), monthly_salary(salVal) {}
```

```cpp
    void displayInfo() override {
        student::displayInfo();
        cout << "Designation: " << job_title << endl;
        cout << "Salary: $" << monthly_salary << endl;
    }
};


int main() {
    student s1("Aslam", "BSCS");
    teacher t1("Zahid", "Assistant Professor");
    TA ta1("Nasir", "BSEE", "TA", 1000);


    s1.displayInfo();
    t1.displayInfo();
    ta1.displayInfo();


    return 0;
}
```