C13-14

The problems in this problem set cover lectures **C13** and **C14**

1.
a.   Define a **robust** algorithm to carry out integer division using repeated subtraction.
        Your algorithm accepts two integers and returns the quotient and the remainder.
        Hint: What are the preconditions and postconditions of your algorithm?

b.   **Implement** your algorithm as an Ada95 program, using exception handling to
        provide robustness.

Turn in a hard copy of your algorithm and code listing, and an electronic copy of your
code.

2.
a.   What is the **cyclomatic complexity** of the code fragment shown below?

```
loop
    exit when Flag := True;

    if A < 100 and B > 200 then
       if A > 50 then
          Sum := Sum +2;
       else
          Sum := Sum +1;
       end if;
    else
       if B < 300 then
          Sum:= Sum -1;
       else
          Sum := Sum -2;
       end if;
    end if;
end loop;
```
Hint: Draw the control flow graph

b.   What is the minimum number of test cases needed to test the fragment of code
        shown below? **Justify your answer**.

```
if A < 100 and B > 200 then
   if A > 50 then
      Sum := Sum +2;
   else
      Sum := Sum +1;
   end if;
else
   if B < 300 then
      Sum:= Sum -1;
   else
      Sum := Sum -2;
   end if;
end if;
```

```
        end if;
```