Lab 07 - Runtime

Copy the directory Lab07 from ReidConsole/Labs, and then, write your solutions by modifying "lab07.cpp"; and then, upload the directory to your GitHub account.

For this lab, your objective is to provide a description of the behavior of each function and calculate their runtime. When calculating their runtime, let the processing cost, c_i, be 1 for control structure conditions and 0 for everything else. Furthermore, indicate what n in the runtime refers to. Note: ternary expressions are control structures.

- Function A

```
int A(Vector<int>& data)
{
 if(data.Length() <= 1)
 {
  return 0;
 }
 int mn = (data[0] <= data[1])?(data[0]):(data[1]);
 int mx = data[0] + data[1] - mn;
 int n = data.Length();
 int i = 0;

 while(i < n)
 {
  if(mx < data[i])
  {
   mx = data[i];
  }
  else if(mn > data[i])
  {
   mn = data[i];
  }
  i += 1;
 }
 return (mx - mn);
}
```

- Function B

```
string B(int dy)
{
 int os = 5;
 string wkdy[7] = {"Sunday"};
 wkdy[1] = "Monday";
 wkdy[2] = "Tuesday";
 wkdy[3] = "Wednesday";
 wkdy[4] = "Thursday";
 wkdy[5] = "Friday";
 wkdy[6] = "Saturday";

 if(dy <= 0 || dy > 29)
 {
  return "Not a valid day";
 }
 return wkdy[(os + dy) % 7];
}
```

□ Function C

```
bool C(int n)
{
 int p = (n < 0)?(-1 * n):(n);

 for(int i = 2;i * i <= p;i += 1)
 {
  if(p % i != 0)
  {
   return false;
  }
 }
 return (p > 1);
}
```

□ Function D

```
void D(Vector<int>& data,int n)
{
 if(n >= 1)
 {
  for(int i = 1;i <= n;i += 1)
  {
   for(int j = 1;j <= n;j += 1)
   {
    data.Insert(i * j);
   }
  }
 }
}
```

□ Function E

```
int E(int n)
{
 return (n > 0)?(n * (n + 1) * (2 * n + 1) / 6):(0);
}
```

□ Function F

```
string F(int n)
{
 if(n <= 0)
 {
  return "0";
 }
 string cur = "";
 char dc;
 int di;

 while(n > 0)
 {
  di = n % 10;
  dc = (char)('0'+ di);
  cur = dc + cur;
  n /= 10;
 }
 return cur;
}
```