COMP2113 Programming Technologies

ENGG1340 Computer Programming II

Module 5 Checkpoint Exercise

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Instructions:

For each single question or each group of questions in the Checkpoint exercise, please type your answer right after the question in this Word document.

**Checkpoint 5.1 (Please submit your answer to Moodle)**

Error(s) may include in the following sub-questions. If you think there is/are error(s), try to find out and suggest some way(s) to fix the error(s). If no error, please write “No error”.

|  |
| --- |
| #include <iostream>  using namespace std;  double multiplication(double a, double b){      int result;      result = k \* j;      return result;  }  int main(){      double result;      result = multiplication(2.5, 1.5);      cout << result << endl;      return 0;  } |

Ans:

1. k & j are not declared in the multiplication function. To fix, adjust the names of parameters.
2. The multiplication function only returns result in integer. To fix, adjust the type of result.

Adjusted code:

#include <iostream>

using namespace std;

double multiplication(double k, double j){

double result;

result = k \* j;

return result;

}

int main(){

double result;

result = multiplication(2.5, 1.5);

cout << result << endl;

return 0;

}

|  |
| --- |
| #include <iostream>  using namespace std;  void a(){      a = 8;      void b(){          b = 9;          void c(){              c = 10;          }      }  }  int main(){      // calling b()      b();      return 0;  } |

Ans:

1. The code is trying to assign values to the function names a, b, and c. However, these names are function identifiers, and you cannot assign values to them as if they are variables.
2. In C++, you cannot define functions inside other functions. The functions b() and c() are defined inside a(), which is not allowed.
3. In main(), the function b() is called, but b() is not visible in the scope of main() since it is incorrectly defined inside a().

**Checkpoint 5.2 (Please submit your answer to Moodle)**

Student A writes the following code. However, when he compiles the code, some compilation errors are found.

|  |
| --- |
| #include <iostream>  using namespace std;  int main(){      int y = 9;      int x = 7;      int i = 0;      while (i < 3){          if (i % 2 == 0){              g(x);              i++;          }          else{              g(y);              i++;          }      }  }  void g(int& k){      static int num = 6;      if (k % 2 == 0){          num += 2;          k = k + 6;      }      else{          num -= 2;          k = k - 6;      }      cout << num << ", " << k << endl;  } |

a) Find out the errors and suggest some ways to fix the errors.

b) Write down the program output after you fix the errors in (a).

Ans:

1. There’s some format problems in line 20: void g(int& k){. It should be written as void g(int &k){.
2. The function is not declared before the main function. To fix, add void g(int &k); before the main function.

The output is

4, 1

2, 3

0, -5

**Checkpoint 5.3 (Please submit your answer to Moodle)**

Given the following program:

|  |
| --- |
| #include <cmath>  #include <iostream>  using namespace std;  int k = 10;  void display(int m){      cout << m << endl;  }  int main(){      for (int j = 50; j >= 1; j--){          if (j % 2 == 0){              k = k + j;          }      }      display(k);      return 0;  } |

a) What is the scope of variable k?

b) What is the scope of parameter m?

c) What is the scope of variable j?

Ans:

1. k is a global variable, and can be accessed and modified by any function.
2. m is a local variable to function display(). Its scope is limited to display().
3. j is a local variable within t he for loop inside main().

**Checkpoint 5.4 (Please submit your answer to Moodle)**

Given the following program:

|  |
| --- |
| #include <iostream>  using namespace std;  void f(double &p, double &q, double r, double s){      double w;      w = q;      q = p;      p = w;      r = 10 \* p;      s = 100 \* q;  }  int main(){      double a, b, c, d;      b = 1.1;      c = 10.1;      a = 100.1;      d = 1000.1;      f(a, b, c, d);      cout << a << "\n" << b << "\n" << c << "\n" << d << endl;      return 0;  } |

a) Write down the expected program output.

b) What would be the program output if line 4 is replaced by “void f(double &p, double &q, double &r, double &s) {” ?

Ans:

a):

1.1

100.1

10.1

1000.1

b)

1.1

100.1

11

10010