ENGG1340 Computer Programming II

COMP2113 Programming Technologies

Module 5 Checkpoint Exercise

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Instructions:

For checkpoint 5.1 – 5.5, please type your answer right after the question in this Word document and submit the file on Moodle. For checkpoint 5.6 onwards, please complete them on the corresponding activities on Moodle.

**Checkpoint 5.1**

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: In the multiplication function, the variables k & j were used which have not been declared in that scope. The intention of the programmer was most likely to write result = a \* b; . Additionally, the result of the multiplication is stored in a variable of type int which may result in loss of data, so it’s best to replace it with double

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

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

Ans: Inside the function a(), the “variables” a, b, c’s type was not stated before declaring them so writing int before the variables’ names may help. Additionally, function definitions inside other functions are not supported in C++ (unless they are lambda functions). So we need to declare the end of each of the functions a(), b() with a ‘}’ token before declaring a new function.

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

**Checkpoint 5.2**

Write down the function prototype (without parameter names), for each of the following functions:

1. A function called largest that takes four double-precision, floating-point arguments, a, b, c and d, and returns a double-precision, floating-point as the result.
2. A function called getPerimeter that does not take any arguments and returns an integer as the result.
3. A function called setPrice that takes a double-precision, floating-point argument, price, and does not return a value.

Ans:

1. double largest(double, double, double, double);
2. int getPerimeter();
3. void setPrice(double);

**Checkpoint 5.3**

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;  } |

1. Find out the errors and suggest some ways to fix the errors.
2. Write down the program output after you fix the errors in (a).

Ans:

1. The function was not defined before the main() functio

|  |
| --- |
| #include <iostream>  using namespace std;  void g(int&)  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;  } |

**Checkpoint 5.4**

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;  } |

1. What is the scope of variable k?
2. What is the scope of parameter m?
3. What is the scope of variable j?

Ans:

1. Global
2. The display() function
3. The first for loop in the main() function

**Checkpoint 5.5**

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;  } |

1. Write down the expected program output.
2. What would be the program output if line 4 is replaced by:  
   void f(double &p, double &q, double &r, double &s) { ?

Ans: